

**RELEVANCE OF THE TRAINING AND VISIT EXTENSION
MESSAGES IN THE MULTIPLE CROPPING SYSTEM
IN WA DISTRICT OF THE
UPPER WEST REGION, GHANA**

BY



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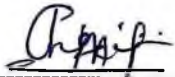
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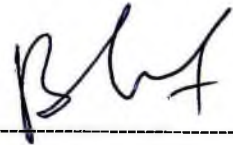
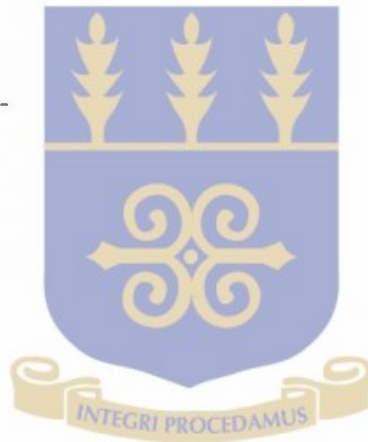


DECLARATION

I declare that, this thesis with the exception of the identified quotations, is the product of my own research, and written entirely by me. None of the materials contained herein, has been presented either in whole or in part for an award of a degree at any other University.



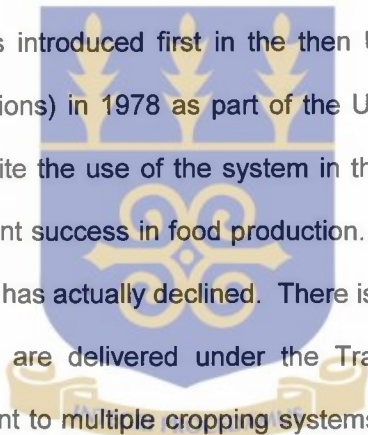
ABUDU MUMUNI INSAH
(CANDIDATE)



DR. P. B ATENGDEM
(SUPERVISOR)

ABSTRACTS

Sub-Saharan Africa depends on agriculture for economic growth and the well being of its people. The sub-region, and indeed the whole of Africa, has been losing a running battle to make agricultural production meet the ever-increasing population. To make food production cope with the population growth and to achieve economic development, many extension models have been tried. Currently the pre-dominant extension system in Africa is the Training and Visit extension system.



In Ghana the system was introduced first in the then Upper Region (now Upper West and Upper East regions) in 1978 as part of the Upper Region Development Project (URADep). Despite the use of the system in the region for more than 15 years, there is no significant success in food production. In the case of Wa District per capita food production has actually declined. There is concern that the nature of extension messages that are delivered under the Training and Visit extension system may not be relevant to multiple cropping systems and in rainfed agriculture (Axinn 1991). The people of Wa District practice multiple cropping system in addition to the raising of livestock. They also depend on rainfed agriculture.

The objective of the study was therefore, to find out whether messages communicated in the Training and Visit approach is relevant in the prevalent multiple cropping system in the Wa District of the Upper West Region of Ghana.

The population of the study comprised of all farmers living and farming within the Wa District. It also includes the extension agents operating in the area. Two samples were used for the study: - (i) 100 farmer respondents and (ii) 15 extension agent respondents. The farmer respondents consisted of 50 contact farmers and 50 noncontact farmers of the Ministry of Food and Agriculture. Simple random sampling was used for the selection of contact farmers and purposive sampling for noncontact farmers. A structured interview schedule was used to collect information from the farmer respondents and a questionnaire was administered to the extension agents. Data collected was analysed qualitatively and quantitatively using appropriate statistical methods. Chi-square tests was used to establish the statistical significance and relations between variables. The probability level used was 0.05.

The sampled farming population was ageing one with a mean age of 45 years. Majority of the farmers had no formal education. Females and the youth were seldom involved in extension activities. The farmers were not generally involved in their needs identification but had good relations with the extension agents. Information provided was top-down. The information was timely and the farmers were satisfied about the way information was presented to them. They found the information to meet their needs.

There was a significant difference in relevance of information to farmers practising the various cropping systems, as sole croppers find extension messages delivered far relevant than mixed croppers ($\chi^2=5.8$, $df=1$ $p<0.05$).

The availability of inputs, credit and rainfall were the basic hindrances to the utilisation of the information. Information flow from the contact farmers to the noncontact farmers occurs at lower level than expected in theory. The main source of information to the contact farmers was the extension agents. For the noncontact farmers their main source of information was other farmers and neighbours.

To make the information relevant to all farmers, it is recommended that, farmers must necessarily be involved in their need identification, selection of contact farmers should be left to the farmers themselves and research should be done to find ways of increasing the relevance of extension messages to multiple crop farmers

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DEDICATION

**Dedicated to my family - my mother, Wurikye also known
as Naama, my lovely wife Mariam; and
my children, Fa-iza and Mumbasir.**

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ACRONYMS

ADRA:	Adventist Relief Agency
AEA:	Agricultural Extension Agent
AEO:	Agricultural Extension Officer
APP:	Agricultural Programme Planning
ARP:	Agricultural Rehabilitation Project
CPA:	Cotton Production Assistant
DAES:	Department of Agricultural Extension Services
DDAS:	District Directors of Agriculture
ETP:	Extension Test Plot
FASCOM:	Farmers Services Company
FSC:	Farmers Services Centres
GCC:	Ghana Cotton Company
GTZ:	Deutsche Gesellschaft für Technische Zusammenarbeit
IFAD:	International Fund for Agricultural Development
MOFA:	Ministry of Food and Agriculture
NGOS:	Non-Governmental Organizations
PDL:	Plantations Development Limited
PPMED:	Policy Planning Monitoring and Evaluation Department
SG200:	Sasakawa Global 2000
SMS:	Subject Matter specialist
T & V:	Training and Visit
UGFCC:	United Ghana Farmers Co-operative Council
URADEP:	Upper Regional Agricultural Development project
UWADEP:	Upper West Agricultural Development Project
UWL:	Upper West Limited
VORADEP:	Volta Regional Agricultural Development Project

CHAPTER ONE

INTRODUCTION

1.0. Background Statement

The population of human beings has been increasing over the years. Though this increase in the past was not much of a worry to many people, the economists were much solicitous. Malthus, for instance, sounded a warning in 1798 that population would eventually outstrip food supply (Snodgrass and Wallace, 1984). He observed that food production was increasing in an arithmetic ratio while population was increasing at a geometric ratio (Snodgrass and Wallace, 1984). His prediction, in spite of modern criticisms, seems now confirmed. In Ghana, for instance, the growth of agricultural productivity since 1985 to date has averaged 2.1% per annum compared to the population growth rate, which is estimated at 2.6-3.2%. It is projected that if Ghana is unable to carry out its population programme successfully, the population will grow at 3.2% (and if successfully, 2.6%) by the year 2000 against a projected agricultural growth rate of about 2.1% (Cassaday, Monnet, and Dowswell. 1995).

An increase in population will lead to a reduction in the food available per person unless food production is increased at an equal or higher rate. We have now entered a period where growth of population threatens man with famine at levels undreamed of in the past, and technology to improve quantity and quality of foodstuffs seem ever more important (Anderson, 1975), hence the reliance on

scientific research for the development of technologies to increase food production.

However, the technology will not be useful if they are not transmitted to farmers for adoption. This calls for an effective extension service.

An effective extension service, as stated by Savile (1976), act as a connecting link between the research service of a department of agriculture and the farming community. It provides farmers with the findings of the research workers and uses this knowledge to solve farmers' problems. Extension workers must also bring farmers problems to the notice of the research workers so that these problems can be solved (Savile, 1976). Thus, extension and research are dependent on each other for their successful operation (Benor and Baxter, 1986). Such a link is necessary for achieving the national goal of increased agricultural production. In pursuance of this objective, various extension systems have been tried including Training and Visit extension system (T & V).

The training and visit system was developed using one specific crop. Even though it has not been specified that it must be applied to sole cropping, in many areas where it achieved success, it was based on sole cropping. For instance, in Turkey, in the Seyhan Project, it was based on cotton. In India, in Rajasthan, it was based on paddy rice production and in Madhya Pradesh, it was based on wheat. In Kenya, in Africa, it was based on the flint maize (Benor and Baxter, 1986).

In Ghana the T & V system covers all agricultural extension activities where the extension agent gives information on crops, livestock, fisheries and soil

conservation. In fact, the extension agent is the only one who provides recommendations to farmers on all agricultural production sectors.

The cropping system commonly practised in Ghana and in many areas of tropical Africa is multiple cropping. The same farmers in multiple cropping may also engage in livestock production. Multiple cropping is the first form of agriculture and if not forced to do otherwise, small holders in the tropics will continue to practice it (Reijntjes, Harverkort, and Waters-Bayer, 1992). This may be due to the inherent advantages the system has. Some of the advantages include

- decreased farming risks including reduction of the effect of pests and drought,
- productivity, in terms of harvestable products per unit area, is higher than sole crop,
- making better use of available space,
- prevent erosion,
- recycle available nutrients and water (Reijntjes et al, 1992)

The implication of this multiple cropping system along with livestock production is that farmers will require different information on the various crops and animals within the system which differ in time and space. However, the Training and Visit system emphasises crop specific recommendations and practices that are relevant to a particular season, even in the multiple cropping system. It is therefore unlikely that messages delivered in the Training and Visit extension approach are timely and able to address the information needs of farmers practising multiple cropping.

Thus, there is a need for empirical verification, weather messages delivered in the

T & V extension system are relevant to the information needs of farmers practising multiple cropping. To address this problem one needs to look at the concept of information transfer.

For information to be relevant, it must be both adequate and timely. According to Adams (1991), for information to be adequate in addressing the needs of the farmers,

- a. they must be involved in the identification of their needs
- b. the information must be something that is of interest and can be applied to achieve their desire,
- c. the total context of the farmers, their beliefs, values, resources and goals must be considered, and
- d. it must have observable results, be simple, can be tried and have a relative advantage over the current practice.

Further, for such information to be timely,

- a. it should be time in and between cropping periods well before the critical date (e.g., sowing, harvesting, pest control etc.)
- b. slack periods should be used for information delivery
- c. keeping to planned and announced dates.

A message that does not possess these attributes may not be appropriate for the transfer of innovations and may not adequately address the information needs of the farmers. In addition, under rainfed and multiple cropping situations, it is unlikely that the structured nature of the T & V extension messages are likely to meet these the above conditions. It is therefore necessary to determine whether the messages

delivered are adequate, timely and suitable to the multiple cropping system practised in Ghana.

1.1. Statement of the Problem

In spite of the significant merits of the Training and Visit in extension delivery, there may be difficulties in practice in the multiple cropping systems, since the suitability of a particular approach can only be within the context of the prevailing conditions.

Difficulties may arise in practice since the T & V system was originally developed for sole cropping under irrigation projects and is now transferred wholesale to rain-fed agriculture where farm families live in a variety of situations (Albrecht, Bergman, Dielderich, Grober, Hoffman, Keller, Payer, and Sulzer, 1989). The centralised approach of the T & V extension system makes it difficult to take account of different circumstances of farmers. As Adams (1991) put it, further problems arose from the more diverse needs of the overall farming population. From personal observation most of the information delivered are usually from superior officers without sufficient consideration of the farmers' situation. For the individual farmer, therefore, it is most unlikely that he or she will pay attention if the extension worker is bringing him information that is not related to his current activity.

Albrecht et al (1989), states that many elements from Training and Visit catalogue of recommendation can be applied successfully, provided they have been checked for suitability and tried out under the prevailing conditions. It is, however, regrettable that despite the rapid spread of the Training and Visit approach and the different ways it can be evaluated, hardly had any empirical studies been carried

out on its suitability to multiple cropping systems culture like Ghana. The Training and Visit was introduced in the Upper West Region of Ghana in 1978 as part of the Upper Region Agricultural Development Project (URADEP) and to the rest of the country in 1993. Despite the use of the system in the region for more than 15 years, there is still no evidence of significant agriculture growth, a deviation from that of the Asian experience where production increased by 56.6% within three years (Hulme, 1991). Instead, per capita food production had declined in Wa District (De Boar, 1996). This decline could be as a result of many factors such as climatic conditions, lack of inputs and the irrelevance of information to the farmers.

1.2. Research Question

Are messages delivered in the Training and Visit extension system able to address adequately and timely the information needs of the multiple crop farmers in Wa District of the Upper West Region of Ghana?

1.3 Objectives of the Study:

This section deals with the objectives of the study and it is discussed under main objectives and sub-objectives.

1.3.1. Main objective:

The objective of the study is to find out whether messages communicated in the Training and Visit approach are relevant in the multiple cropping system culture.

1.3.1.1. Sub-objectives:

To achieve the main objective, the following specific objectives were set -

1. To find out the demographic background of farmers and the type of cropping system they practice.
2. To examine the association of social characteristics and cropping systems.
3. To find out the extent of contact with extension messages
4. To examine the association between relevance of extension messages and the cropping systems.
5. To determine whether the information delivered by extension agents adequately meet the needs of the farmers engaged in various cropping systems.
6. To find out the problems faced by extension agents in information delivery in Wa District.

1.4. Significance of the study

The question for all extension policy makers and implementers is whether they are actually succeeding in effectively teaching the target groups with messages and

whether they are able to help them solve their problems. The study will aid in finding out whether the farmers are effectively reached with messages and whether the messages are able to solve their farming problems. In this way it may bring out issues that can help policy makers to develop alternative strategies that will help in achieving the aims and objectives of extension.

The study may also be useful to the extension agents. It may help them discern whether their efforts benefit the farmers, whether their messages are relevant to their clients, and whether they are able to help in alleviating their clients' problems. Based on the findings, they may need to make some adjustment that will improve extension delivery to the target group if the current poor agricultural performance is as a result of the nature of their extension delivery.

Since the farmer is the ultimate beneficiary of extension activities, it is hoped that, the study will provide information that will enable policy makers and the implementers (extension agents) to provide the appropriate extension messages needed by the farmer in appropriate fashion to enable him/her increase his/her production and his level of living.

1.5. Definition of Terms

Relevance: whether the information is adequate, timely, suitable and farmers are able to put it into practice.

Message: important information, ideas, skills or what we want the audience to do.

Suitability: Is used to refer to whether messages meet the needs of the target group, whether the target groups attach any importance to the message and whether farmers make use of the message.

Multiple cropping: Growing two or more crops in the same field in a crop season or year (Ado-Quaye, Saah, Tachie-Mensah, Adam, Rockson-Akorley and Kitson, 1993)

Mono/sole cropping: Growing one annual crop to maturity at a time on a piece of land (Ado-Quaye et al, 1993)

Communication process: the process of sending and receiving messages through channels which establish common meanings between a source and a receiver (Van de Ben and Hawkins (1986)

Information transfer: Helping to convey ideas in such a way that it fulfils a particular need of the client and can be effectively applied by the client to his or her own situation.

Mutual understanding: Refers to a situation where both the sender and receiver of information comprehend each other during the communication process.

CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction

This chapter deals with the concepts and theories upon which the study was based. It is organised into two sections, i. the conceptual and theoretical frame work and ii. review of related literature.

The conceptual and theoretical framework deals with concepts and theories related to the study. It is organised under the following headings:- communication process, information transfer and factors related to information utilisation. The rest of the chapter described the research model, components of the model, and how the model works.

The review of related work was done based on the objectives of the study. Titles under which the section was organised include Farming systems, Characteristics of agricultural practices in the study area, and need for effective extension system. Others are the origin and evolution of Training and Visit and characteristics of agriculture in Ghana.

2.1. Conceptual and Theoretical Framework

The concepts and theories chosen for the study include the communication process, information transfer, mutual understanding and collaboration, message effect on relations between people, and social context of the client. Others are mutual interest in

information, timing of information, presentation of information, information transfer as a cyclical process and factors related to information utilisation. The research framework is organised into the research model, components of the model and how the model works.

These concepts were chosen because of their relationship to the delivery of relevant extension messages. An effective communication process is needed for the transfer of information in such a way (timely, good presentation, understanding and fits into the social context of the target group) that the target group find the information relevant, so as to elicit their desire to try and subsequently to continue to use the information.

2.1.1. The communication process

The Training and Visit system focuses on helping farmers achieve the maximum in crop and livestock production and profits with little or no increase in cash inputs (Blackburn, 1989). This can be achieved by filling the farmers information gap with relevant information through effective communication. An effective communication should be able to meet the needs of the clientele. A need is the difference between the desirable situation and the actual situation (Boone, 1985).

The process of communication is fundamental to extension training and passing on information. Thus learning processes, the dissemination of innovations or social change cannot be explained without reference to communication (Albrecht et al, 1989). Extension is concerned with technology transfer. Technology transfer according to

Whale, as cited by Blackburn (1989), is defined as “helping to convey information in such a way that (a) it fulfils a particular need of the client and (b) it can be effectively applied by the client to his or her own situation” (Blackburn, 1989:p 108).

Communication is the process of sending and receiving messages through channels, which establish common meanings between a source and a receiver (Van de Ban and Hawkins, 1988). In the process of communication, an idea must be changed into a message made up of several physical elements (words) with a symbolic meaning. Thus, the idea must be encoded into symbols which meaning is attached. The source sends this message through a channel to a receiver. The receiver decodes the message, attaches meaning to the symbols, and develops an idea in his mind which he may or may not use (the effect of the communication). The source observes this effect and uses it to evaluate the impact of his message (feedback) (Van de Ban and Hawkins 1988).

When an extension worker talks with one farmer, the extension worker may start the conversation. Therefore, he is the source or sender. What he says is the message, the spoken word is the channel and the farmer is the receiver. When the farmer replies, the roles are temporally reversed. The farmer is the sender and the extension worker becomes the receiver. The farmers' response is called feedback (Maunder, 1972)

The communication process consists of four essential elements, the sender or communicator of ideas, messages to be transmitted, the channel or means of

communication and receiver of information or audience (ibid.). These elements can be represented as a simple model.

Sender-----Message-----Channel-----Receiver.

{SMCR model or linear model (ibid.)}

Each of the elements has influence on the effectiveness of the communication process.

The Sender requires credibility. He needs to be believed and to have confidence of his audience. The purpose of the message should be clear in the senders' mind. Its content should be relevant to the receiver, something of interest to him. The treatment of the message does much to make it acceptable to the receiver. The effectiveness of the channel depends on the circumstances such as spatial distribution of the client, time, resources et cetera.

Several models have been developed to explain the process of communication. Among the popular models are the linear model, and the convergence model (Blackburn, 1989).

The linear model focuses on the message and the means of transferring it from an information source to a receiver. It is valuable if the objective is to give the client information. In that case the agent is an information disseminator, serving only the 'a' part of the technology transfer (fulfilling a particular need of a client). However, the model has limitations if the objective is to make sure the client can put the information to use.

Whale (1989), reviewing the model wrote that the linear notion of communication is based on the idea that information is a 'thing' that can be carried or sent from one point to another. The receiver of information is characterised as an isolated person. There is feedback from the person who receives the message to the person who sent it; new messages may be sent to correct or clarify the perception the receiver has of the original message. However, little or no reference is made to the content or situation within which the person receives the information and intends to use it. There is no expectation that the person sending the message will alter his or her understanding of its contents. The model assumes one way, largely authoritarian, persuasive or manipulative communication 'down' through a system. It overlooks the assertion that a technology cannot be understood outside the environment where it is to be used (Whale, 1989)

2.1.2. Information transfer

The convergence model of communication is seen as most successful in the transfer of technology. This is due largely to the fact that it emphasises information exchange and relationships rather than individual as the unit of analysis. Communication is based on a collaborative relationship between the person who needs the information and the communicator. Whale (1989), comparing the work of Zaltman (1979), on convergence model and that of Louise (1983) on linear model noted that the interactive approach (the convergence model) was more successful. It was also found that a strong orientation in which Extension agent and client worked together was the one factor, which distinguished, successful from unsuccessful planned social change. He concluded, "it

is not enough that extension agents simply facilitates access to the information their clients need. The interactive role essential to effective implementation of the convergence model, need to be performed at each place of the technology transfer process” (Blackburn, 1989 p 110). Whale (1989), making reference to the work of Rogers and Kincaid (1981), states that the convergence model identifies effective communication as having the following characteristics.

- a. Working primarily toward mutual understanding, consensus and collective action.
- b. Concentrating on how the message will affect relationships between people as opposed to its psychological effect on the individual.
- c. Focusing on the total context, not just the information to be communicated.
- d. Cyclical: - the change agent and the farmer sharing information until they reach a mutual understanding.
- e. Focusing on interaction between people, who share a mutual interest in the information.
- f. Considering the timing and presentation of the message as well as the message itself.

The extension worker focuses on people who share mutual interest in the information.

The message being delivered to the farmer must be something that is of interest to him, something that will satisfy his or her needs. The extension worker might achieve better results starting with the person for whom the technology had the greatest meaning

immediately. Where the farmer does not see the message as one that will meet his immediate need there may be the tendency to reject or attach little importance to it.

2.1.3. Mutual understanding and collaboration.

The extension agent and the farmer collaboratively identify what information is needed since any change will ultimately depend upon the co-operation of the farmers themselves (Adams, 1990). To ensure genuine co-operation in the information and the extension programme farmers should be actively involved in the initial planning procedures as well as execution. Direct involvement in planning extension work gives them personal interest in the success of the proposed programme and can help dispel suspicion and mistrust (Maczarski, 1979). This enables them to see themselves and the extension agent as a group working toward a common goal. It facilitates the achievement of the basic stages of group formation (Boone, 1985).

Boone (1985), discussing the work of Shultze and Gerlach (1958) wrote that there are three basic stages in a group formation inclusion, control and affection. Inclusion occurs when the individuals feel that they are part of the group. Control occurs when the individuals develop a great need to control affairs. Affection is positive feeling developed by the group members (Boone, 1985). It is also observed that people are committed to goals in proportion to their degree of participation in determining those goals. The implication is that, information needs collaboratively identified will facilitate mutual understanding, consensus and collective action.

Bennis, Benne, and Chine (1969), also gave two obvious reasons for collaboration.

1. Collaboration is the crux of healthy, trusting relationship. Without mutual trust between client and extension agents, completely valid data relevant to their situation cannot be deduced for intelligent management of the situation. Without adequate data, diagnosis will be false and misleading.

2. Man's fantasies about the undesirable, possibly, degrading aspects of prospective change, lead him to resist it without rational consideration. When change is mutually desirable and rational, a basic risk factor remains. A trusting, positive relationship is essential in order for the client to overcome at least some of his strong gears of resistance to change (Bennis et al, 1969).

In recent years it has been rediscovered that farmers must be listened to, and learned from, to assess their practices, identify their training needs and find solutions together, solutions that are relevant to farmers' needs, constraints, circumstances and personal projects (Cassaday et al, 1995). Production recommendations taught to farmers must be relevant to their needs and resources' conditions (Benor and Baxter, 1984). This is possible when the farmers are involved in the extension process. In a situation where information is delivered from 'above' it is usually not suitable to the farmers information needs. Besides farmers require varied information.

2.1.4. Messages effect on relations between people

Communication between people produce definite effects on relations. A message contains information about the relationship between sender and receiver. This is often expressed in the way a message is formulated, in intonation or non-verbal communication. As receivers we have a particular sensitive ear for this aspect of a message. Through it we feel respected and flattered or hurt and ill treated. Communication means therefore the expression of a particular kind of relationship with the person addressed (Albrecht et al, 1989). A man will often communicate differently with his son than he does with his wife. This is evident from the words he uses, his gestures et cetera. Messages are mostly intended to fulfil a particular purpose, such as influencing people or to stimulate them to action. This often reflects on the relationship because it can be imparted in such a way that the person feels respected or belittled (Albrecht et al, 1989).

Therefore, the way in which the farmer perceives his relationship with the extension agent has considerable influence on the farmers' reaction to the extension agents' message. Resistance to extension information will be reduced if participants experience acceptance, support, trust and confidence in their relations with one another (Bennis et al 1969)

2.1.5. Social context of the client

The reception and adoption of extension information are considerably influenced by the wider social context of the farmer. This includes the social structure, and the social system. For instance a complex of personal relations exists between the individual

farmer and his family, his circle of friends and the village community, which influence his behaviour. It is the social structure that determines how information is disseminated and which individuals and groups have access to it.

Although people may be staying in the same area and have a common government, numerous differences between and among them do exist with regard to lifestyle, heritage, socio-economic status, culture, pattern of interaction and normative standards. Recognition of these differences is an essential strategy in identifying needs and ultimately tailoring planned programmes to meet the needs of the many and different individuals and groups that reside in an area (Boone, 1985). The ultimate objective of better understanding is to better communicate, influence and sell ideas, practices and products to the clients' system (Bohlen, 1966). Therefore, effective introduction of improved practices is impossible without an effective strategy of approach based on a thorough knowledge and understanding of the farmer and the social and cultural context within which he operates in his home, his village and the local level (Chitamber, 1993)

Extension workers should therefore, try to look at the total context of farmers' situations, in information transfer while avoiding preconceived notions as to what exists. They should focus on some of the more obvious major constraints farmers perceive and experience and the environmental factors affecting agricultural decision-making (Swanson, 1984). He is to assess farmers' needs with respect to the types of technologies that will fit into their farming scheme, the skill levels and information needed to promote successful transfer of the appropriate technology (ibid.).

2.1.6. Mutual interest in information

Learning starts from an interest in something or a felt need for something. The interests of farmers are their needs as perceived by themselves (Muller, 1993). These may not be their real needs, or the solutions they have in mind do not solve their problems. The extension agent has to enter into a 'need negotiation' with the farmers during information transfer about new technologies (ibid.). In the dialectical process of needs negotiation the needs as felt by the learners and the needs as seen by the extension agent must be brought together to reach a consensus on the 'real needs' (ibid.). This will help develop mutual interest in the information needs.

The real needs must correspond to the experience of the farmers. If a farmer gets the impression that his experience is not being valued he feels rejected as a person. When they are able to relate new sides to their experience, they find meaning in it. "Needs-negotiations" are necessary to keep the balance between the interests and needs as voiced by the farmers and the information carried by the extension agent which the farmers have to become familiar with in order to acquire knowledge and competence and to get the feeling of success and achievement. Successful extension agents begin their work with farmers by finding and using these interests and felt needs (Maunder, 1972).

2.1.7. Timing of information

Whenever affairs are working out well, whether as cultural systems or for individuals, there is not much incentive to make changes. However, when there are crises, there is

a natural tendency to try new actions. The use of timing to introduce an innovation requires that the change agent know a fair amount about the local scene (Arensberg et al, 1969) so that he will be able to introduce it at the opportune time in relation to special circumstances or events. The meaning a technology has for a farmer may vary from one point in time to another depending on whether conditions, cropping objectives, family aspirations, obligations or commitments, personal view of capabilities, relationships with neighbours, personal values and beliefs. The extension agent might achieve better results starting with the person for whom the technology has the greatest meaning immediately (Blackburn, 1989).

Extension information should be timed in and between cropping periods, well before the critical date (Albrecht et al, 1989). For instance information about sowing should be presented before the planting date and not when the farmers begin planting. Slack periods should be used for extension activities. The extension agent must keep to planned and announced date and time.

2.1.8. Presentation of information

Presentation of a message does much to make it acceptable and understandable to the receiver. For the message to be effective, it should be structured clearly and in such a way that the farmer can integrate it in his present pattern of thinking, often based on concrete experience (Van de Ban & Hawkins, 1988). It should be logically organised.

The extension agent must know his facts. present them with sincerity and enthusiasm and in a manner that the farmer will understand (Bradfield, 1966). It should conform to

accepted social standards. Treatment can make a message interesting or dull and boring (Maunder, 1972)

2.1.9. Information transfer as a cyclical process

The extension agents' goal is to have his farmer consider using the improved practices. The extension agent shares information to be interpreted by the farmer. The farmer considers his total circumstances, life and interests. The farmer shares that interpretation. The extension agent reconsiders the original information in light of the interpretation and shares his or her new understanding. Both parties continue to share understandings until they achieve convergence, a level of mutual understanding that is sufficiently congruent to allow action to be taken. Throughout the process, the farmer becomes increasingly knowledgeable about the practice and how it will be applied to his or her farming situation. The farmer may eventually have sufficient information to judge, whether or not to use the practice. The extension agents have sufficient information to judge whether or not his original goal was appropriate.

2.1.10. Factors Related to Information Utilisation

A relationship exists between demographic factors such as education, sex, wealth, age and a person's ability to understand and utilise information.

2.1.10.1. Education

Education is an important factor that influence the acceptance of new information by farmers (Onu, 1991). Education changes the way farmers think about and solve their farming problems. It imparts new knowledge that might otherwise not be acquired from social experience. It also provides skills for processing information from printed texts and other sources (Eisemon, 1992). The level of education of the farmer will therefore enhance his understanding and the likelihood of utilisation of the information.

The proper application of information on agricultural technologies such as agro-chemicals, inorganic fertilisers as well as new varieties require users to process complex procedural information with prior knowledge that enables inferences. Eisemon (1990), reporting on his work in Kenya, noted that comprehension of procedures for applying agro-chemicals for instance, communicated orally or through printed texts is influenced by schooling. There is also the tendency for educated farmers to look else where other than the extension agent for information. Whale (1989), reported that studies done in Saskatchewan showed that the higher the level of education the greater the degree to identify universities, government departments of agriculture and journals as the most important source of information. As a result, higher education decreases the dependency on the extension agent.

The educated people are however, seen by the uneducated as people who are ahead and away from rural life to urban opportunities. Those who acquire formal education and training believe that the knowledge and skills they have acquired are superior and

that uneducated and untrained rural people are ignorant and unskilled. This creates a gap between the educated and the uneducated, which limits communication (Rogers, 1995). Therefore information transfer between the two groups will be limited.

2.1.10.2. Wealth

The degree of wealth of the clientele has influence in the acceptance and uses of information. A wealthy farmer is able to try innovations that will otherwise not have been tried because of the expected cost involved. Adams (1990), noted that, in many societies, prestige is measured by two standards - the degree of conformity to accepted standards of behaviour and wealth. A wealthy man may be able to experiment with new information or idea without endangering his prestige and position. Rogers (1995), also wrote that, more elite contact farmers are similar in socio-economic status to the extension agent and so communication between the two is easier and more effective. A poorer man on the other hand may expose himself to criticism and ridicule from his neighbours. He may see technologies adopted by wealthy people as something that is 'for the rich' . Lower status farmers are socio-economically different from the change agent and this impedes effective communication.

2.1.10.3 Sex

Sex has an influence in the acceptance and utilisation of extension messages. In Sub-Saharan Africa, including Ghana, there is a gender division of labour (Mehra, 1995). Where the message is not directed to the appropriate sex, it is likely to fail. For instance, Mehra (1994), reporting on the work of Suito and Weidemann (1990), stated that a village livestock project in Burkina Faso failed because information and resources on small animals were directed at men, even though women were primarily responsible for small livestock production.

2.1.10.4 Age.

Adults at different stages differ substantially in the way they selectively attend to what is taught, and organises, recall, articulate and use information (Blackburn, 1989). A middle aged or older adult may be in a more crucial position regarding job loss than a younger adult (ibid.) This is because the middle-aged adult is likely to have formulated a concept of himself as one who must "make it" (ibid.) More so, at this stage of the life span the adult is likely to have a greater responsibility to the livelihood of members of the family and will therefore not be willing to take risks. Coupled with this is the store of knowledge obtained through experience over the years. Any new knowledge that the extension agent is willing to impart must fit into the adults' experience, which may result in a conflict emanating from change. This may contribute to the reluctance of older adults in the acceptance and utilisation of information as it is in the late majority and laggard's categories of the adoption curve. In the work of Onu (1991), he found out that

farm information source use decreased with increased age of farmers. This implies that, young farmers are more alert to attaining information sources that discuss new concepts of improving their vocations than older farmers. Thus, age has a relationship to the acceptance and utilisation of information. However, Rogers (1995) wrote that there is inconsistent evidence about the relationship of age and information utilisation (or innovativeness) and that over 228 studies conducted show no relationship. A few show that earlier adopters are younger, and some indicate they are older.

2.1.11. The Research Model

Technology transfer is helping to convey information in such a way that (a) it fulfils a particular need of the client and (b) it can be effectively applied to his or her own situation (Blackburn, 1989). For an information to fulfil a client's need, it must be relevant to the client's cropping system he or she practices. To be relevant, certain conditions must exist and some procedures followed, all in an effort to tailor the information to meet the needs of the client in relation to his or her cropping practice. These conditions and processes are developed into a model (Figure 2.1).

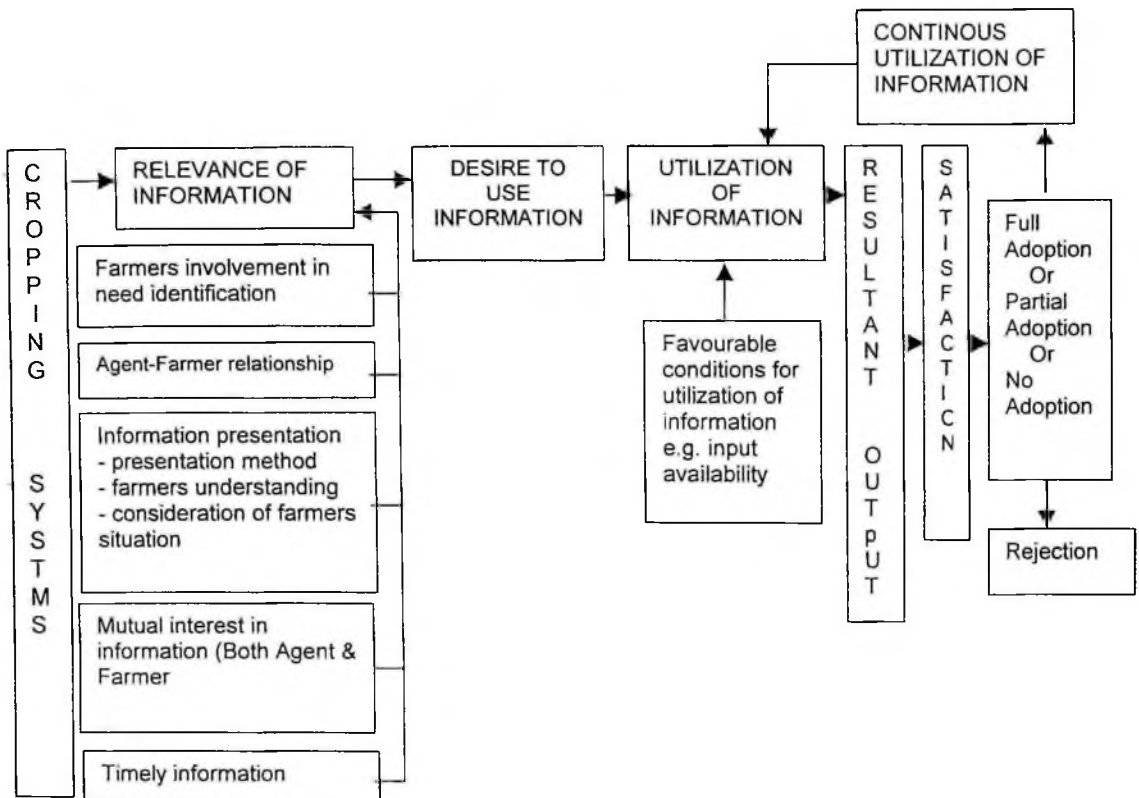


Figure 2.1 The Research Model

2.1.11.1 Components of the model

a. Cropping systems

Whether messages or information is relevant or not is likely to depend on the extent to which these are consistent with the cropping systems practised by the farmers. This is because the type of cropping system a farmer is practising will influence the variability of his information needs. For instance one who is practising mixed farming will require

information on crops and animals. Timing of information may also be more complex with multiple cropping, as the farmers will require different information at different times and sequence. Sole cropping allows for harmonious extension activities. When the information is relevant and the inputs are available, the farmer has to apply it to the farming system he is practising. The cropping system is therefore an independent variable and relevance a dependent variable.

b. Farmers' involvement and participation in needs identification:

For an information to fulfil a particular need the farmer must be involved and actively participate in the needs identification process. This as Axinn (1991) put it, is to increase the relevance of extension messages to farm people. The client must be treated as an active partner who participates with full understanding of the desires, expectations and commitment. Where this does not occur, the change agent will, if not total, sometimes meet with rejection.

c. Cordial relationship between agent and farmer:

The change agent should be able to establish cordial relations with the client. For the AEAs to have any measure of success in serving the client, he or she must establish cordial relationships with the clients in which there are sufficient respect and trust. Only then can the client reveal his problems and participate in the search for solutions that will be relevant to his needs.

d. Presentation of information:

Presentation of a message does much to make it understandable and acceptable to the receiver. The information should be structured clearly and understandable to the client. For instance mass methods can be used to create awareness and individual methods to help those individuals who are having problems using the information. In presentation, the farmers' situation, climatic conditions, and his resources must be considered before selecting and carrying information to him or her. Also, included is his culture. The agent has to learn the farmers culture and build bridges that allow new knowledge to cross into the culture. Therefore, the understanding and acceptance of information depend on the presentation.

e. Mutual interest in information:

Change occurs only when the learner recognises a personal need and the possibility of changing to meet that need. When this recognition of need and the possibility of changing to meet the need occurs, the person becomes interested. Learning starts from interest in something or a felt need for something. Therefore, a person will be willing to make use of information that he or she has interest in.

f. Timing of information:

Timing of the information is necessary to make the information relevant. The use of timing to introduce an innovation requires that the change agent knows a fair amount about the local scene so that he will be able to introduce it at the opportune time in relation to special circumstances or events. The meaning a technology has for a farmer

varies from one point in time to another. Therefore, timing is necessary to make an information relevant to the client.

g. Relevance of information

For information to be relevant or suitable to the receiver, the receiver must be involved in the identification of his felt needs. Cordial relationship must exist between the AEA and the farmer. The information must be presented in such a way that the farmer desires the information. Both the farmer and the AEA should be interested in the information. The information should be timed in such a way that it is presented at the time the farmer can use it.

h. Favourable conditions for utilisation of information.

Availability of inputs, credit, labour, marketing and favourable climatic conditions are needed to facilitate the application of the information or idea. With this, is the nature of the technology, idea or information.

i. Utilisation of information

When the farmer is optimistic that the information is relevant, favourable conditions are available, and it is also applicable to his situation he puts the information (idea) into practice. And with favourable results he or she achieves satisfaction.

j. Adoption of information:

Full, partial, or non-adoption of the information will depend on his or her continuous satisfaction with the results. If the farmer continues to achieve satisfaction he or she will continue to use the information. On the other hand, where satisfaction is not achieved the idea will not be adopted. Rejection of the technology will occur if the farmer does not achieve satisfaction with the new idea.

2.1.11.2. How the model works

In effective extension work, the client is viewed as the central focus of extension effort. For the farmer to have the desire to use information, it must be something that can help him achieve his felt needs. It must be something that is applicable to his or her situation. As such the farmers information needs depend upon the type of cropping system being practised. Thus, the cropping system determines the relevance of the information.

To provide relevant information, five conditions must be met - the farmer must be involved and actively participate in the needs identification. There must be cordial relationship between the AEA and the farmer which will facilitate trust and respect. After establishing relationship with the farmer and helping to identify his felt needs, the solution to these problems must be presented in a manner that will make it acceptable - considering the total context of the farmer. The information should also be timely, presented at the time that he can learn and apply the information to his situation. All

these will contribute to making the information relevant to the farmer, thereby eliciting his interest in the information.

When the farmer sees the information relevant and interested in it, he or she will develop the desire to use the information. Desire to use the information will eventually lead to utilisation. The farmers' ability to use the information will be influenced or facilitated by favourable conditions, such as rainfall in the case of field crops, and the availability of inputs. With favourable conditions and eventual utilisation of the information the farmer will achieve results. The results will also influence his level of satisfaction derived from the use of the information. When the farmers achieve satisfaction from the resultant output, he or she will decide to fully adopt, partially adopt or not adopt the information. This will lead to continuous utilisation of the information. Lack of satisfaction can also lead to non-adoption and therefore rejection.

2.2. Review of Related Literature

This section deals with related literature. It was reviewed under the following subsections: - farming systems, classification of farming systems, need for effective extension system, origin and evolution of training and visit extension system. The other subsections are the advantages of the Training and Visit, disadvantages of the Training and Visit, Training and Visit extension system as practised in Ghana, characteristics of agriculture in Ghana and the situation in Asia.

2.2.1. Farming systems

Reinjtjes, Coen, Harvekort Bertus, Water-Bayer (1992), making reference to the work of Shancer et al (1982), defined farming systems as a particular arrangement of farming enterprises (e.g. cropping, livestock keeping, processing farm products) that are managed in response to the physical, biological and socio-economic environment and in accordance with the farmers' goals, preferences and resources. Thus, the system of farming practised in any area is influenced by:

- Physical factors of the environment, such as climate and soil,
- Biological factors such as vegetation and animals, including diseases and pests;
- Socio-economic factors, such as customs and traditions, educational level, nutrition and health, the level of economic development, infrastructure, access to credit.

2.2.1.1 Classification of farming systems:

In the process of adopting cropping patterns and farming techniques to the natural, economic, and socio-political conditions of each location and the aims of the farmers, more or less distinct farm systems have developed (Ruthenberg, 1986). Among these are the farm land-use systems, such as shifting cultivation, rotation, and permanent cultivation; animal husbandry systems such as pastorals; and cropping systems. Of special concern is the cropping system. Some of the cropping systems such as agro-forestry, rotational cropping, sole cropping and multiple cropping are described as follows.

i. Agro-forestry:

Agro-forestry is a farm land use system that involves more or less intimate association of different plant components, always including a woody perennial with or without livestock on the same unit of land (Addo-Quaye et al, 1993). There are three major classifications of agro-forestry land-use systems:

- Trees grown in association with both crops and livestock (Agri-silvipasture)
- Trees grown in association with livestock (Silvia-pasture)
- Trees grown in association with crops (agro.-silviculture) (Ibid.)

Agro-silviculture is the most popular and is practised traditionally. An example of the traditional agro-forestry system of this kind are the home gardens. A typical home garden contain intensive mix of crops of all types. Cereals such as maize, millet; vegetables such as okra and pepper, and tree crops such as mango and pawpaw may be planted in the garden.

In modern agro-forestry systems, food crops are planted in alleys between rows of fast growing leguminous trees or shrubs. The tree crops require some pruning during cropping to avoid excessive shading and competition with the food crop.

ii. Mixed farming:

Mixed farming is a system of farming in which livestock is integrated with arable farming. It is a self-sustaining system with some degree of interdependence between livestock production and arable farming. The animals have access to crop residue as feed while the manure generated from them is applied to the land as manure. Mix farming is as the

result of the response of farmers to the natural difficulties of their environment. The great diversity of crops and livestock is a major insurance against total loss, because it is unlikely that many different species of crops and animals will be subjected to the same amount of damage in any one year. Practising this system over a long period of time has resulted in the farmer building a store of knowledge that allowed him to cope, in the most effective way possible, with the ecology of his environment, given the resources at his disposal (Komolafe, Adegbola, Are, and Ashaye, 1981). These resources are mostly his own labour and that of his family using a number of simple farm tools. This is a major characteristic of peasant farming systems throughout West Africa. The farming practice of these peasant farmers is influenced by three major factors. These include:-

- a. The ecological limitations of his particular environment (Komolafe et al, 1981). This limitation may be natural or it may be artificial as a result of inappropriate practices employed leading to degradation
- b. His practices are influenced by the materials and techniques at his disposal. They often depend on their local varieties and traditional techniques of production
- c. Community customs and traditions will influence his agricultural practices. Every community has its customary ways of doing things, even defining what is edible or inedible. This may influence their selection of plants and animals.

iii. Sole cropping:

Sole cropping is that method wherein one crop is grown in a field at any one time. It is the most widely used method in commercial agriculture. The system permits the farmer to become an expert with one-crop system. Mechanisation and use of pesticides are easier to accomplish with only one crop in the field. Timing of cultural operations is easier to determine (Hall, Cannell, and Lawton, 1979). It has become the trend in the development of farming. Its adoption in the developing world is seen as a symbol of development. Sole cropping appears to be the most suitable cropping systems for T & V extension system because of its uniformity of farm operations.

iv. Multiple cropping:

Multiple cropping is the growing of two or more crops in the same field in a crop season or year. There is intensification of cropping in time and space dimensions. It is the most common of cropping systems in Ghana (Addo-Quaye et al, 1993). Multiple cropping can be divided into two broad classes: a) intercropping and b) sequential cropping.

(a) Intercropping is the most common definition of multiple cropping and involves growing two or more crops at the same time on the same field. Major variations of the system include:

- i). Mixed cropping:- This is the growing of two or more crops without distinct row arrangement.
- ii) Ridge row intercropping:- distinct row arrangement of crops on ridges.

- iii) Phased planting:- Systematic arrangement of planting dates of the intercrops to ensure a sequence of growth and harvesting.
- iv) Other variations include relay intercropping, strip intercropping and alley cropping.

(b) Sequential cropping system: - This is also a form of multiple cropping where two or more crops are grown on the same piece of land per year. The succeeding crop is planted after the harvest of the preceding one.

Reijntjes et al (1993), stated the following advantages of the multiple cropping system:

- i. In most multiple cropping systems developed by small holders, productivity in terms of harvestable products per unit area is higher than under sole cropping with the same level of management. Yield advantages can range from 20% - 80%. These differences can be explained by a combination of higher growth rates, reduction of losses on accounts of weeds, insects and diseases and more efficient use of the available resources of water, light and nutrients. For instance where sorghum is intercropped with cowpea, any farming practice on the farm is applicable to both crops.
- ii. As several crops are grown, failure of one crop to produce enough can be compensated by other crops. This decreases farming risks.
- iii. Multiple cropping systems make better use of available space for root and canopy growth, recycle available nutrients and water to higher levels and acts as a buffer

capacity for adverse periods and events such as drought. In other words they make good use of and give better protection to the farm's natural capital (Reijntjes et al, 1993).

2.2.2. Need for Effective Extension System

In spite of these advantages the multiple cropping system is deemed untidy, inefficient and low yielding. For most of the post independence period in Africa, the emphasis has been on promoting modern agriculture (Spore, 1997). The objective of which is two fold:

a. Populations have expanded rapidly as a result of decreased mortality and high birth rates (Adams, 1990). An increase in population leads to reduction in the food available per person unless food production is increased at an equal or higher rate.

b. Sub-Saharan Africa depends unequivocally on agriculture for economic growth and the well being of its people. Seventy to eighty percent of the population of these countries are involved in agriculture, either directly, as farmers or indirectly in food processing, marketing and servicing industries (Olaitan, 1989). It serves as a foreign currency earner for these countries. If sustained growth is to be achieved and if its people are to achieve higher living standards agriculture must become more productive.

To achieve this objective an effective extension system is needed, a system that is capable of achieving change through peoples voluntary decisions to change (Roling, 1979).

An effective extension system should be able to facilitate the transfer and promotion of the adoption of profitable and appropriate new practices. Benor, Harrison, and Baxter (1984), stated that extension has a vital role in ensuring that agro economic and social environment of farmers and the day to day production problems they face are appreciated by research. This feedback function of extension facilitates the continuous reorientation of research towards the priority needs of farmers and the early resolution of important technological constraints. Thus, it is extension that helps farmers to take advantage of research findings and technological advances, quickly adjust to seasonal and economic conditions, and effectively use support services to increase their production and income (ibid.). With this all important function of extension in sustaining agricultural development many countries established extension systems or models aimed at improving extension delivery. Blackburn (1989), listed four models of extension of which many countries that established extension systems can fit into. They describe virtually every existing form.

These models include (i) the typical Developing Country Extension System, (ii) The Farming System Research and Development, (iii) The United States Co-operative Extension System and (iv) The Training and Visit. Of much concern is that of the Training and Visit (T & V) which is viewed as an idea for reforming agricultural extension services and to raise productivity.

2.2.3. Origin and Evolution of Training and Visit Extension System.

Policies to increase agricultural output and ensure national food self sufficiency led most developing countries to steadily expand the scale of their operations. With persistent dissatisfaction of performance, the Food and Agricultural Organisation (FAO) of the united nations and other bilateral donors became involved with initiatives to strengthen extension (Hulme, 1991).

Hulme (1991), writing on the origin and evolution of T & V, reported that the World Bank sought the services of Daniel Benor, a farmer who had risen through the ranks to become the Director of Israel's agricultural extension, to advise on the Seyhan Project in Turkey. This was an irrigated cotton scheme. Benor drew on his vast experience with Israel's well-regarded and well-resourced extension service in his plans for Seyhan. In particular, his designs emphasised that the fundamental task of extension agents was visiting farmers in situ and that agents must be constantly trained so that they could provide relevant and up-to-date information. He also followed the Israeli system by insisting that extension workers provide only agricultural advice and that they should not be directly involved in credit and input provision or statutory duties. Divergence from the Israeli system included concentration on a single crop, weekly meetings of agents with groups of co-operating farmers and programmed training days for extension workers. Within three years, yields on the project rose from 1.7 tons per hectare to 3.0 tons per hectare. It was therefore, not surprising that Benor was asked to examine the problems of agricultural extension in India when the World Bank was concerned with increasing food production there. In 1974, a project to reform extension services was implemented

in Rajasthan. From this experience a more formalised statement of the features of T & V was developed and it was christened the T & V system (Hulme, 1991).

Benor and Baxter (1984), wrote that the T & V aims at building a professional extension service that is capable of assisting farmers in raising production and increasing incomes and of providing appropriate support for agricultural development. To be successful it must be adopted to fit local conditions. Certain features of the system cannot however, be changed significantly without affecting its operations adversely. The features spelt out include:

i. Professionalism:

Extension staff must be in close contact with relevant scientific development and research to enable them formulate specific recommendations that will be useful to farmers in all kinds of resource situations. They should be able to identify production constraints and appropriate measures to counter them.

ii. Regular and Continuous training:

This is required both to teach and discuss with extension staff specific recommendations needed by farmers. It is a means of identifying actual research findings that are of immediate use to farmers and of developing recommendations that fit specific local conditions. It assists in the exchange of information among staff.

iii. **Single line of command:**

The extension service must be under a single line of technical and administrative command.

iv. **Field and farmer orientation:**

Extension services contact with the farmer must be on a regular basis, on a schedule known to farmers. All other extension staff must visit the field often and regularly to understand the problems faced by farmers.

v. **Concentration of efforts:**

All extension staff work only on agricultural extension. They are not responsible to any activity that is not directly related to extension such as processing.

vi. **Linkage with research:**

Effective extension depends on close linkage with research. Problems that cannot be solved by extension staff are passed on to researchers for solutions. Extension and research staff formulate production recommendations that will be adapted by extension workers. This is necessary to make the best use of local conditions and resources.

vii. **Time-bound work:**

Messages and skills must be taught to farmers in a regular and timely visits to the field. Any break in this time-bound system of training and visits makes effective extension difficult.

viii. Specific duties:

All extension staff perform specific duties that compliment and support the activities of staff at all levels. Each staff position has its own clearly defined and realistic job. The extension agent (Village Extension Worker) is the only extension worker who teaches production recommendations to farmers. The Agricultural Extension Officer (AEO) is to review and assist in the organisational aspects of the job of the extension agents, provide support to him especially to ensure that production recommendations are effectively taught, field problems encountered by extension agent and which he cannot resolve are passed on to the specialist. The Sub-divisional Extension Officer has overall responsibility for effective agricultural extension in his subdivision. He must ensure that agricultural extension has a significant impact on agricultural production and farmers income. He is the organiser, conveyor and leader of fortnightly training sessions.

The Subject Matter Specialist (SMS) provide technical training and guidance to extension agents, formulation of production recommendations and serves as a link between extension and research.

2.2.4. Advantages of T & V extension system

The system, like all others has its merits and demerits. Axinn (1991), stated the following advantages of the system: -

1. It puts pressure on government to re-organise a large number of small extension units into one large integrated service.

2. Pressure on individual officers to leave their offices and meet with farmers on their farms.
3. It brings discipline, which can add greatly to its effectiveness.
4. Because of regular training, extension officers will be more up-to-date with information and technology
5. Field staff receives closer technical supervision.
6. Logistic support to extension works such as transport office and instructional materials are available.
7. It increases potential contact with large number of farm families because of the increase in density (Axinn, 1991).

2.2.5. Disadvantages of the T and V

Albrecht et al (1989), also stated the following as some of the problems of the system:

1. Selection of contact farmers:

Experience has shown that the flow of information frequently stops here or a small proportion of farming families profit and inequalities are the result. In practice local pressures and staff preferences often tend to bias selection of the richer or more powerful farmers.

2. The target group problem:

Farmers' families live in a variety of situations. The centralised approach finds it difficult to take account of differing circumstances.

3. The field advisors' training

The field advisors' training is usually confined to production techniques. There is no appreciation of the relation between farm and family and even the subject matter specialists rarely deal with this aspect satisfactorily.

4. The field advisors:

The field advisers often feel that the prescribed system of visits is unjustified patronisation by Senior Staff.

5. Finance:

Increasing the number of staff and the running costs of the system place a burden on the country's finances.

6. Location and socio-economic conditions:

The system fails to take due account of the differing location, transport and socio-economic conditions. The rural poor who are really in need of help are not being reached (Albrecht et al, 1989).

7. Female farmers:

To date the available evidence indicates that Training and Visit approaches have not been able to tackle the other great structural problem common to extension services, the invisibility of female farmers. The incidence of female contact farmers is low (Hulme, 1991). This was also noted by Axinn (1991). He observed that there is a tendency for T & V to deal primarily with male farmers neglecting the females and the youth.

2.2.6. Modifications of the Training and Visit Extension System.

Hulme (1991), writing on the Training and Visit system, states that a review of available literature suggests a number of T & V tenets have almost always been followed. These are the creation of a unified extension service with a single line of command, the adoption of more systematic work programs for farm visits and training and the use of contact farmers to diffuse messages to the wider agricultural community.

By contrast to Benor et al prescription of T & V principle (stated above), a number of them have been commonly subjected to modifications. Hulme (as cited), has commented on some of them as follows:

a. The principle of exclusive extension

The principle that extension workers should be involved exclusively in extension activities has generally been abandoned. For example, in the modified T & V system of

the Philippines, the reformed extension service is involved with credit provision and broader community development activities. Even in India, where the T & V was perfected, despite formal job statements, the extension agents were widely involved with input supply (Hulme, 1991): In the researchers opinion, that is a better approach because T & V cannot increase production unless the complementary parts of the small farmer development package, input supply, credit, market mechanisms and price incentives, are in place. This is something few T & V advocates will dispute (Robert, 1989).

b. Concentration of efforts:

The concentration of efforts principle has been pursued in areas where technologies exist for major crops, but in other agro-ecological regions especially rain-fed Africa, a few simple messages are not feasible, as such extension agents are involved in adapting extension messages. Examples can be found in Zambia, and Lesotho (Hulme, 1991).

c. Linkage with research

While most projects following T & V principles support closer links with research institutions the implementation of this has often proved to be a problem. In India the research committees described by Benor et al. (1984), have not been established in a number of states while in Somalia difficulties in developing linkage with research stations led to the extension service taking on research functions (ibid.).

2.2.7. Training and Visit Extension System as Practised in Ghana.

The Training and Visit extension system was introduced in Ghana as a pilot project in the then Upper Region (now Upper East and Upper West regions) in 1976 and in Volta Region in 1982 (Geker et al, 1990)

The principle of the Training and Visit appears to be followed to the latter, implementing it as prescribed by Benor. The methodological approach used is that the front-line staff form farmer groups, which are critical for identifying problems militating against their farming enterprises. The front-line staff train farmers singly or in groups, to resolve such problems. This training is done on a scheduled basis through Mini-plot or Extension Test Plots (E.T.P.) demonstrations.

Front-line staff at the district level also meet monthly to discuss problems they encounter during their interactions with farmers. Front-line staff receive training by Subject Matter Specialists and other experts in the system. The Subject Matter Specialists themselves receive training from researchers at bimonthly training meetings. This training takes place at five agro-ecological zonal centres (Cassaday et al, 1995). The noticeable modifications made are as follows:

With the recommended approach, a fortnightly training is held for the extension agents.

It is during this training session that the extension agent and his Agricultural Extension Officer (AEO), learn the recommendations and their impact points for the coming fortnight. The training also serves as a venue for feedback from the field to the other

extension officers and subsequently to the research organisation (Benor and Baxter, 1984). The fortnightly training is commuted to monthly training in Ghana and the Subject Matter Specialist workshop bimonthly (Rep. of Ghana, 1992)

With the normal T & V system the farmers within the area of jurisdiction are divided into eight "farmers groups" (Benor and Baxter, 1984). In each farmers' group, the extension agent focuses on a small number of selected farmers - 'contact farmers' and meets with any other farmers who are willing to attend. The extension agent visits four contact farmers the first week and the other four during the second week (Swanson, 1984). With the implementation of the unification of extension activities, the extension agents' area of jurisdiction is to be divided into 16 groups instead of 8 groups and each group should have 8 contact farmers. Thus, increasing the number of contact farmers to 128.

In the recommended approach the Agricultural Extension Officer carries out supervisory roles and the provision of feedback to research organisation. This supervisory work is carried out by the District Extension Officer and his deputy. The Sub-divisional Extension Officer has the overall extension responsibility for effective agricultural extension in his subdivision. This position does not exist. However, with the full implementation of the unification, each district is to be divided into four zones, each zone will be supervised by an AEO.

In Ghana, the system makes use of on farm adaptive trials. These adoptive trials are carried out to determine how far recommendations are found feasible by farmers to

adopt, given the various factors such as the prevailing farming systems, available labour and farmers' resources (Rep. of Ghana, 1992). Demonstrations are then carried out to persuade farmers to adopt the recommendations on portions of their farms (ibid.).

Unlike other areas, such as India and Kenya where the emphasis had been on a single crop, it involves all agricultural extension activities of crops, animal husbandry, agro-forestry et cetera. Technological recommendations to farmers tend to be based on research done by scientists who do not generally study farmers' practices before formulating their research issues (Rep of Ghana. 1992). Programmes are planned at headquarters in consultation with the regional extension officers and executed at the district level by the District and the Field Level Extension Officer (Rep. of Ghana, 1992)

2.2.8. Characteristics of Agriculture in Ghana

Ghana inherited an extension system that was run by the Department of Agriculture, Fisheries and Forestry of the United Kingdom. During this colonial era the major objective was enforcing regulations and providing services to farmers (Geker et al, 1990). The primary focus of extension activities was on export crops (notably oil, rubber and cocoa); later emphasis was given to food crops and livestock. In response to demands for more employment and cheaper food, after independence, Ghana experimented with various approaches of agricultural extension. For instance the United Ghana Farmers Co-operatives Council (UGFCC) was formed to organise farmers into co-operatives and to provide services to the farmers (Geker et al, 1990). Other approaches include collectivised agricultural organisations, such as the Ghana State

Farms Co-operation, Ghana workers Brigade et cetera (Cassaday et al, 1995) as well as church related development schemes and several donor projects (Rep. of Ghana, 1992).

The more recent and prominent experience are the extension programmes initiated under World Bank assisted Upper Regional Agricultural Development Project (URADEP) 1976-84 Volta Regional Agricultural Development Project (VORADEP) 1982-88, the Agricultural Services Rehabilitation Project (ASRP), Global 2000, Grain and Legume Development Project et cetera. One of the main components of these programmes was strengthening of the extension services through the introductions of the Training and Visit system (Rep. of Ghana, 1992)

Ghana has six main agro-ecological zones defined on the basis of climate, reflected by the natural vegetation and influenced by the soils. These are Rain Forest, Deciduous Forest Transitional zone, coastal Savannah, Guinea Savannah and Sudan Savannah.

Rainfall distribution differs in these agro-ecological zones. In the Deciduous forest, Rain forest, Transitional and Coastal Savannah there are two seasons, the major and minor seasons. In the Guinea Savannah and Sudan Savannah there is only one season. In effect Ghana depends on rain-fed agriculture (PPMED, 1991).

Ghana's agriculture is predominantly a small holder activity. Fifty six percent (56.5%) of land holdings is less than 1.2 hectares, 26.4% is between 1.2 and 2 hectares and

17.1% is above 2 hectares. The main system of farming is traditional, with hoe and cutlass, there is relatively little mechanised farming. Crops are grown in mixtures, inter-cropped or relay cropped or alley cropped. Various types of animals are kept in greater or lesser intensity (Cassaday et al, 1995). These systems vary by agro-ecological zone. However, whatever system is practised, it is based on the rational economy and risk aversion strategies of the farmer (ibid.).

The basic farming practice is subsistence farming. Subsistence farming is a farming enterprise, which provides an individual, a family, or families with their needs for food and commodities necessary for survival (Hall et al 1979). Agricultural supplies, such as high quality seeds, fertilisers, pesticides and machinery, even when available on the market are beyond the reach of subsistence farmers because of lack of capital. This is further worsened by the governments withdrawal of subsidies on agricultural inputs.

Access to formal agricultural credit is difficult for illiterates not to mention the absence of collateral required by the banks. Interest rates in the informal sector are known to be high and the terms are merciless (Donhauser and Kipo, 1991). Farmers willing to innovate have to cope with malfunctioning rural input markets, which increase the price for the inputs considerably before they actually reach the farm gate. The same deficient market structures come into play when the farmers want to sell their produce resulting in low farm gate prices, in particular during the harvest period (Donhauser & Kipo, 1991). The result is low farm income, keeping them in perpetual poverty at the advantage of

middlemen. As a consequence cultural practices are generally relegated to manual labour techniques.

Farmers in Ghana depend on rain-fed agriculture. The pattern of rainfall is virtually unpredictable. Irrigation facilities are limited to a few areas. Only 0.03% of land area is under irrigation (Policy Planning Monitoring and Evaluation Department (PPMED), 1991)

Subsistence farmers tend to be conservative in their approach to improved technologies because their lives may depend upon the outcome. The subsistence farmer knows what has worked in the past and he is reluctant to change from the known to the unknown. Consequently it is difficult for subsistence farmers to change their cultural practices (Hall et al, 1979)

2.2.9. The Situation in Asia

In the case of Asia, unlike Ghana, technical package, such as seed, fertiliser, and pesticides is relatively simple for crops such as wheat, rice and corn. Irrigated areas allow uniform sowing dates and control of Agricultural tasks (Robert, 1989). In those circumstances messages could be sent as scheduled.

There was also a backlog of poorly disseminated technologies. Inputs and credit were freely available due to a well-developed private sector. In Ghana input-output price relationship is unfavourable due to high input prices and low income. In Asia, input-

output price relation was attractive enough for farmers to invest in new technologies. The country's infrastructure base was also sound (Robert, 1989).

The implication of Ghana's different agro-ecological zones and the mixed farming is that farmers will require different information on the various crops, animals and other practices within the system, which differ in time and space. Farmers have complex cropping systems and highly varied ecological conditions and their techniques differ by year, altitude and soil micro-conditions" (Robert, 1989). Ghana does not differ from this complex information needs. To address this problem one need to look at the concept of information transfer.

CHAPTER THREE

SYNOPSIS OF AGRICULTURE IN WA DISTRICT

3.0 Introduction

This chapter, the synopsis of agriculture in Wa district, describes the research area.

It also provides information about the agricultural situation, as well as other extension initiatives in the district. These other extension initiatives are the non-governmental organisations that are, in one way or the other, involved in extension activities.

3.1. Geographical Location:

Wa District is located in the Upper West Region of Ghana and lies between latitudes 9° 40' North and 10° 20' and Longitude 1° 40" West and 2° 45' West.

3.2. Soil types:

The main soil type in the District is savannah *Ochrosol*. At valley bottoms can be found tropical black earths, which are hard, heavy and dark coloured.

3.3. Area:

Wa District is 589.3 km square in area, which is about 32% of the total land area of the region.

3.4. Vegetation:

This is mainly Guinea Savannah, which takes the form of woodland. Most of the trees found in this area are fire resistant and have thick barks. There are several perennial woody tree species among which are several economic trees that grow wild such as Shea butter tree (*Butyrospermum parkii*), Locust bean (*Parkia biglobosa*), Black plum (*Vitax domiana*), Swamp ebony (*Diospyros mespilliformis*) baobab (*Adansonia digitata*) and Desert date (*Balanite aegyptiaca*). During the rainy season grass grow very rapidly, reaching a height of 1.5 to 3 M. These are frequently burned off during the dry season between November and April. The main crops cultivated in this area are cereals. These crops are millet, maize, sorghum and rice. The rice is cultivated in valley bottoms, which are seasonally flooded. Yam and cotton do well in this area too.

3.5. Climatic conditions:

The major elements of the weather that influence the climatic conditions are temperature, rainfall distribution and humidity.

3.5.1. Temperature:

Temperature varies greatly between the harmattan and the hot season (January - May). A temperature range of 20°C minimum and a maximum of 41°C are experienced in the district (Meteorological Services Department 1998).

3.5.2. Rainfall distribution:

Rainfall, occurs between April and September. Mean annual rainfall is 1100 mm. The rainfall distribution and intensity are unreliable (Meteorological Services Department 1998). The dry season is very long and imposes a limit to the cultivation of crops without irrigation.

3.5.3. Humidity:

The relative humidity is fairly moderate in the rainy season and very low and cold during the harmattan (dry north-easterly wind). In the wet season (May-September), it ranges between 70% and 95%. During the dry season (November - April) it ranges between 7% and 60% (Meteorological Service Department. 1998)

3.6. Land tenure system:

Land tenure systems practised in the District are mainly Freehold, Use hold, Stool and family land holding systems with a few lease lands (Department of Agricultural Extension Services, 1997). Freehold is a system whereby everybody has the right to use the land in a given locality. Use hold is the holding of land or the use of land on trust from the community with exclusive rights during the occupancy. If the occupant abandons the land, someone else can use it. In general availability of land is not a constraint for bush farm development.

3.7. Livestock rearing systems:

Livestock rearing systems practised in the District are free range and semi-intensive systems. Mostly small ruminants are reared on free range while cattle and fowls are confined in the night. The animals are allowed to roam and breed freely regardless of quality. Majority of the animals has to find their own food.

3.8. Methods of cultivation:

Types of farms in the District include compound farms, bush farms, rotational bush fallow and irrigated dry season gardening (Department of Agricultural Extension Services, 1997). All traditional food crops may be mixed cropped. Thus, a typical field is cultivated to different crops.

3.8.1 Compound farms:

Compound farms are usually cultivated around the homestead. In general they are small 0.25-1 ha. Soil fertility is maintained or improved by household refuse, ashes, crop residues and animal manure. Production of compound farms is supplementary to bush farms. Short duration crops such as maize, sorghum, millet, groundnut, cowpea and tobacco are cultivated. Vegetables such as pumpkin, and okra are also grown.

3.8.2. Bush farms:

Bush farms are considered the major farms and are cited far from home, usually 3 - 15 km. Crops grown are maize, sorghum, millet, cowpea, groundnut, bambara beans, yam,

cassava and cotton. Yields of crops tend to be lower than that of compound farms since very little is done to improve soil fertility (de Boer, 1996).

3.8.3. Kitchen gardens:

These are small gardens often made with the objective of obtaining vegetables for the house hold use. Surpluses are sold. Irrigated dry season gardening is mostly practised in valley bottoms. Small dugouts are constructed inside the gardens, taking advantage of the high level of the water table in these areas.

3.8.4. Flood land cultivation:

This is the cultivation of annually flooded alluvium. Rice is the main crop planted in these areas. Occasionally maize is planted early so that it will reach maturity before flooding occurs.

3.8.5. Rotation bush fallow:

Rotation bush fallow (where land is left to recover its fertility so that it can be used after a period of years), is the main practice of regenerating soil fertility on bush farms. The fallow period lasts from five to ten years (Boer, 1996)

3.9. Labour:

Land cultivation depends mainly on the use of family labour. Some communities in the district have labour societies often made up of two or more members who work in turns on the holding of others especially during the peak season. A member of the community may also solicit the assistance of others (communal labour) for any of the farm operations. In that case lunch and supper will have to be provided. According to Boer, (1996), farmers were complaining that communal farming was getting difficult and the cost of feeding labour force had become prohibitive. The main labour constraint is the absence of young, strong men to clear and prepare the land in April/may (Boer, 1996). Most young men migrate to the south at this time in search of work. Hired labour, however, is becoming a dominant practice.

3.10. Water bodies:

Major rivers in the district are the Black Volta to the West and Kulpawn to the East. Dams have been constructed to create water bodies for farming during the dry season. The majority of dams were constructed in the 1960s, most of which are either silted or broken down (Boer, 1996). Busa dam (constructed in 1971) is the only one with irrigation valves. However, the irrigation canals are still under construction. Due to lack of irrigation facilities, agricultural production in the District depends solely on precipitation.

3.11. Gender role in farming activities:

Traditionally, the division of labour is based on gender. Land clearing, ploughing and weeding is normally done by men, while women do the planting. Harvesting is done by both men and women (Boer, 1996:8). Men cut the stalks (e.g., sorghum, millet) and do the trashing. The women do the winnowing and carry the grain home for storage. Only men are entitled to land. For cultivation, the wife will have to seek land from the husband. Women are allocated separate fields, which form part of their husbands fields. She will grow some cash/food crops, mainly groundnut, cowpea and cotton. Men are responsible for the production of staple foods (sorghum, millet, maize and Yam). Boer, making reference to the work of IFAD (1996), stated that "women have by far the higher work load, since farming is done in addition to their normal house hold duties and income generating activities.

3.12. Programme Planning in the District:

In conformity with the objectives of the National Agricultural Extension Programme, the bottom up method and systems approach are envisaged for the programme building.

The objectives of the planning include -

- To review the previous year agricultural activities, achievements, constraints, suggested solutions (Appendix A) (Department of Agricultural Extension Service, 1997).

- To conclude on agricultural activities for the current year, areas to cover and specific impact points, technologies to transfer, training workshops, research and adaptive trials (Department of Agricultural Extension Service., 1997).

The planning process goes through four stages/levels. The first stage is the operational area level planning where farmers collaborate with Agricultural Extension Agents (AEAs) to discover felt farming problems. These problems are then collated and synthesised. The second stage is the district level planning. At this stage the farming problems gathered through participatory approach are discussed in collaboration with farmers, District assemblies, research and other Ministry of Food and Agriculture (MoFA) staff (example of the programme plan is shown in Appendix B) The third stage is dubbed the Subject Matter Specialist (SMS) level planning. At this level, the planning activities include review of the previous year's programme (Appendix A) discussions of current years programme, identification of training topics, research and adaptive trials. The objective of this level of planning is to consider the proposed current year's programme of work emanating from problems arising out of the review of the previous year's programme by SMSs, researchers, and District officers so that training topics, researchable topics and technologies for implementation are concluded. The final stage (forth stage) is the Zonal level planning. At this level efforts are made to fine-tune and endorse all the conclusions drawn at the district, SMS and regional levels. In drawing up a programme, room is created for inputs of collaborating Non-Governmental Organisations (NGOs) so as to avoid duplication whilst enhancing co-operation (Department of Agricultural Extension Service, 1997). Some of the important NGOs are described below.

3.13. Other Extension Initiatives in the District

There are several NGOs that operate in the district all aimed at enhancing the living standards of the people through improvement in their farming activities. Some of these NGOs and foreign donors are described briefly below.

3.13.1 Ghana Cotton Company Limited (GCCL):

It makes use of the "contract farmer" approach to extension. Inputs are provided to farmers and the cost of these inputs is deducted during purchase. Produce may be paid in cash or in kind to the farmer. Farmers may opt for bicycles, cloth etc. cost of which is deducted at source before payment.

The following extension activities spelt out by Geker, Fiadjoe, Sakyi-Dawson, Atengdem and Ocloo (1990) are still in operation.

- 1. The cotton production assistant (CPA) who is in direct contact with the farmers, conduct farmers' census. The CPA obtains a record of farmers who desire to grow cotton during the coming season and determine the hectares or acres the farmer can manage.
- 2. The company pre-finance land preparation, specifically, ploughing.
- 3. It provides inputs to the farmers including cottonseed, fertiliser and insecticides.
- 4. It offers extension education, advice to farmers through regular visits.
- 5. Provide market facilities. GCC purchases and evacuates seed cotton from the farm gate to the ginnery.

An important extension activity that trickles to non-cotton farmers is that of row planting and time to begin farming. Many of the farmers learn to plant in lines through the CPA (Geker et al, 1990:41)

Plantations Development limited (PDL), and Upper West limited (UWL) also use the same procedure in the production of seed cotton.

3.13.2. Suntaa - Nuntaa:

Suntaa-Nuntaa is a Non-Governmental Organisation in the District. Its activities include:

- 1. Agro-forestry:- teaching interested groups nursery management and planting of trees.
- 2. Theatre for development:- using drama and puppetry to educate people on bush fires and tree planting
- 3. Cottage industries:- helping groups, especially women to raise woodlot for cash.

3.13.3. Sasakawa Global 2000 (SG 2000)

The project came into being in 1986 and it is still on going. SG 2000 did not employ its own staff but makes use of the AEAs in the system. It is convinced that increased food production can be attained through the dissemination of simple technologies and

through the rational and effective provision of a range of services to farmers, including inputs, credit and attractive producer prices. SG 2000 still provides input on credit basis to farmers. Inputs often provided include certified seed and insecticides.

3.13.4. Techno-Serve:

It is an NGO that provides consultancy and supervision in a number of agro-processing programmes and works closely with extension in the district. Its basic function in the district is to support income-generating activities by providing credit to its clients. Beneficiaries must be in groups to qualify for credit.

3.13.5. International Fund for Agricultural Development (IFAD)

The Upper West Agricultural Development Project (UWADEP) is an IFAD and Government of Ghana-sponsored project. The project is aimed at increasing agricultural production and income through agricultural interventions, more efficient use of land and water resources and improved road access to market areas of agricultural importance.

The Project support for Extension Activities is based on

- a. Strengthening extension services to farmers groups with a view to increasing the production of groundnut and other legumes as a means of improving soil fertility and family nutrition and increasing farmer incomes.

- b Promoting wider adoption of phosphatic fertiliser in conjunction with organic fertiliser.
- c. Utilisation of the immense potential in animal traction available to the farmers
- d. Exposing farmers and AEAs to the activities of other farmers involved in similar projects in other regions (Republic of Ghana, 1996)

3.13.6. Africa 2000

Africa 2000, an NGO, provides credit facilities to groups of farmers especially women. Credit provided is expected to be paid back in small amounts. The beneficiaries pay in small amounts, as low as one thousand cedis and the amount recorded until the credit is fully repaid. However, it is expected that the beneficiaries pay back by the beginning of the next season to qualify for the next facility and for others to benefit. Other NGOs include Adventist Relief Agency (ADRA), and Catholic Agricultural Unit

3.13.7. Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ)

GTZ also started operation in the District in 1996. The executing agency of the project is MoFA. The project is implemented in conjunction with other government organisations, NGOs and community-based organisations. The goal of the project is to contribute to the improvement of living conditions of households in rural areas through permanent and easy access to water (GTZ, 1997). The project is still in the orientation phase and has therefore not attained any recognisable success.

3.14. Summary:

In summary, the district agricultural situation is characterised with low, unreliable rainfall which the farmers depend on for agricultural production. The rainfall lasts about six months with a long dry season during which bushes are burned. Irrigation facilities are lacking in the district, which pose a hindrance to dry season farming. Bush farms, compound farms and kitchen gardens are the types of farms they establish. Rotation bush fallow is the main practice of regenerating soil fertility. In the farming activities there is a gender role, where certain duties are performed by men some by women and others both gender. Many energetic young men migrate elsewhere in search of work during the long dry season resulting in shortage of labour during the beginning of the cropping season. Availability of land is not a constraint to bush farm development. However, there are other constraints to agricultural production in the district. Boer (1996), in his work identified these problems among others:

1. Poor climatic conditions,
2. Inadequate water supply for dry season gardening,
3. No market outlets to buy farm inputs at community level. Previously AEAs sold farm inputs to farmers during their visits and later through Farmers Services Company (FASCOM) stores.
4. High cost of drugs and farm inputs such as pesticides and fertilizer.
5. Lack of credit facilities
6. Lack of labour

7. Bush burning, which not only destroys biomass and degrades the soil but frequently destroys farm produce.
8. Declining crop yield per acre.
9. Lack of technical support from AEA's.

Agricultural Programme Planning (APP) is done to meet the national objectives.

Planning within the District is done at the operational level and the District level, involving all stakeholders. The stakeholders include the AEA's, NGOs, District directors of Agriculture (DDAs), the District Assembly, and the farmers. Farmers involved are well-to-do contact farmers who make little contribution to deliberations during the planning session.

The location of Wa district, in relation to Ghana, is indicated in figure 2b. The figure shows the regions and the regional capitals. Wa district is the shaded area in the Upper West Region.

A detailed map of the district is shown in figure 2a. It shows the major towns and villages of agricultural extension importance.

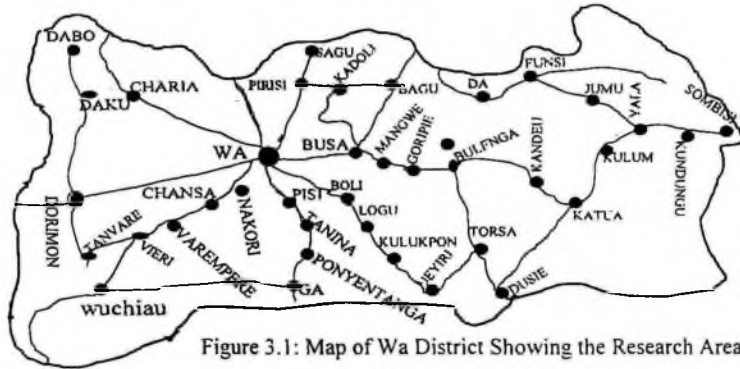


Figure 3.1: Map of Wa District Showing the Research Area



Figure 3.2. Map of Ghana Showing Location of Wa District (The research area)

CHAPTER FOUR

METHODOLOGY

4.0 Introduction

The purpose of this chapter is to describe the method used in carrying out the study. It is organised into the following headings - the research area; research design; population, method of sampling and sample size; data collection instruments and pre-testing; data analysis; delimitation; and limitations to the study.

4.1. The Research Area

The research area, Wa District was chosen because of the following reasons: -

- i. It is within the savannah zone where multiple cropping system is practised. It depends solely on precipitation for agricultural production. This makes the area a good representation of most parts of Ghana and Sub-Sahara Africa at large for that matter.
- ii. It is one of the areas where the Training and Visit extension system was introduced as a pilot project in 1978. The system has been in operation since then. This period was considered long enough for farmers in the district to have adequate knowledge of the Training and Visit extension messages.

is an area where per capita food production had been reported to be falling (De Boer, 1996). This make it appear to be true that the system is only suitable to homogenous conditions like that in India and not heterogeneous conditions such as that of Ghana (Adams, 1990 and Robert, 1989), thus prompting the selection of the area for the study.

4.2. Research design

The design selected for the study was the survey research design. This was because the study involved asking a group of people (respondents) questions. Selected respondents were asked questions and how the respondents distributed themselves among the variables of the study was determined.

4.3. Population, Method of Sampling and Sample Size.

The population from which the sample was taken for the study comprised all farmers living and farming within the district. This farming population was selected because the Training and Visit targets all farmers in the district.

Three samples were drawn for the study. These were -

- (i) The contact farmers - the farmers chosen by the extension agent in the T & V approach to serve as a link between the agent and the other farmers
- (ii) The non-contact farmers;
- (iii) The agricultural extension agents (AEAs) in the Wa District.

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... farmers were needed to: - (i) determine the relevance of the content of messages delivered by the extension agents to their situation, (ii) help determine whether the messages are timely enough to meet their requirements. They were also needed because only farmers who received information from the extension workers can evaluate their relevance. In this way the farmer may be in a better position to say which messages are time bound and relevant to their situation. (iii) Problems they face in the implementation of the messages. (iv) Find out how they relate to non-contact farmers.

The non-contact farmers were used to find out the flow of information between them and the contact farmers. It was also used in assessing the effectiveness of the messages they received.

Inclusion of the extension agent was to aid the finding out of the problems they encounter, and their relations with the farmers. Their inclusion was necessary because ineffectiveness of the messages could stem from problems related to the extension delivery rather than at the point of implementation.

Simple random sampling technique was used to select the contact farmers since a sampling frame could be obtained from the district office. Sampling of the non-contact farmers was purposive. This was because enumeration of all farmers in the district was not feasible to facilitate probability sampling. The contact farmers selected were then traced to their respective homes or villages. In any village that

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a contact farmer was sampled for the study, a non-contact farmer was also selected from the same village. The idea was that it would aid in a better assessment of the flow of information between the contact and noncontact farmers. All the extension agents (15), operating in the area before the unification were used for the study.

Fifty (50) contact farmers and fifty noncontact farmers, giving a sample size of 100 farmer respondents were used for the study. Even though a larger sample would have been a better representation of the population, the issues of time and cost were restrictions on the sample size.. The table below (Table 4.1) indicates the concepts and information that was necessary to assess objectives and the sources of information.

Table 4.1: Concepts, information, and source of information

OBJECTIVE	INFORMATION NEEDED	SOURCE OF INFORMATION	DATA GATHERING TECHNIQUE
Whether information delivered is adequate for the needs of farmers	Farmers' participation in information need identification	Contact farmers	Interview
	Farmer/extension agent relationship	Contact farmers & Extension Agent	Interview & Questionnaire
	Consideration of Farmers socio-economic situation	Extension Agents	Questionnaire
	Farmers interest in information received	Contact farmers	Interview
	Timing of information	Contact farmers	Interview
	Mode of Presentation of information	Contact farmers	Interview
Implementation of messages received	Opinion about suitability of messages	Contact farmers	Interview
	Problems encountered in the implementation of messages	Contact & non-contact farmers	Interview
Contact with extension messages	Extent of contact with extension messages	Non-contact farmers	Interview
Delivery of messages	Opinion about suitability of messages to farmers	Extension agents	Interview
	Problems faced in the delivery of messages	Extension agents	Interview
Effectiveness of extension messages and farming system	Various crops grown on the same farm	Contact & non-contact farmers	interview
	Kinds of animals raised	Contact & non-contact farmers	interview
	Information on which impact points have been implemented	Contact & non-contact Farmers	interview

4.4. Data Collection Instruments and Pre-Testing.

The instruments used for the data collection consist of:

- a) A structured interview schedule - used to solicit information from both groups of farmers. This was necessary to minimise response effect that may contribute to biasing of data obtained from the interview. It was also

illiterates. The instrument was arranged into four sections consisting of the demographic background of the farmers, relevance of information to farmers, problems emanating from the implementation of messages received and farming systems practised. Administration of the instrument was done by trained enumerators under a close supervision of the researcher.

- b) A self administered questionnaire was developed and administered to the extension agents. The use of this instrument was appropriate since all the extension agents could read and write. The focus was on opinion about messages delivered to farmers and problems encountered in information delivery.

A pre-test consisting of twelve survey instruments, four for each group was conducted in the district to detect ambiguity and flaws in the questions. The responses facilitated revision of the questions and reduction in time spent during the interview. Since the results of the pre-test was not to form part of the study, the twelve instruments were adequate in serving the purpose of piloting.

4.5. Source of Data:

Only primary source of data was used for the study. This was because the findings were based only on responses of the respondents.

4.6. Data Analysis.

Data collected was coded and analysed both qualitatively and quantitatively using statistical methods. For instance, inferential statistics such as chi-square analysis

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was used to determine the association between effectiveness of messages and various cropping systems farmers are engaged in. The findings are presented in simple percentages, means, modes, frequency distributions and bar charts

4.6.1. Cropping systems:

Frequencies and percentages were used in the analysis of data on farming systems. The responses were categorised into multiple cropping, and sole cropping since they are the basic cropping systems.

4.6.2. Analysis of impact points data.

A list of impact points was collected from the Department of Agricultural Extension Services (D.A.E.S.). The respondents were asked to indicate whether they had received information on the various impact points. The data was analysed using frequencies to determine the major impact points on which information was passed to them. The average of the information received was then calculated and the responses re-categorised into those above the average and those below the average. The same procedure was used for the analysis of information received and carried out. This was done to facilitate discrete categorisation of the responses, which will facilitate the use of chi-square.

4.6.3. Determination of relevance

Determination of relevance was based on the modal response to the factors relationship with the agent, participation in needs identification, presentation, interest, timeliness of information and relevance

The farm sizes of the respondents were measured in acres, which was a common measure. Where the actual farm size could not be given in acres, it was given in traditional measures. These are.

"Bankagli" --¼ of an acre

"Kagli" --- ½ of an acre

"Baraa" ---- 1 acre

4.6.5. Statistical analysis

Chi-square was used to determine whether there was significant relationship or differences between the variables. The chi-square was seen suitable because the data were in discrete categories, making it the appropriate statistical test.

4.7. Delimitation:

It is a well-known fact that extension is only one of the cogwheels in the agricultural machine. Training and Visit cannot increase production unless the complementary parts of the small-farmer development packages, such as input supply and credit, market mechanisms, and price incentives are in place (Roberts, 1989). Favourable climatic conditions are also necessary for successful implementation of extension messages by farmers. In addition to these, the extension messages must be relevant to the beneficiaries so that they will have the desire to use the information. This study sought to determine the relevance of the extension messages delivered to farmers practising the various cropping systems. Because of that, there was no in-depth study of the other factors.

This section deals with limitations to the study and it is organised under extension agents, contact farmers, noncontact farmers, response, and transportation and spatial distance.

4.8.1. Extension Agents:

As a result of the unification of the Ministry of Food and Agriculture and the decentralisation process embarked by the Government of Ghana, the various departments of the ministry had been merged. New operational areas had been created to absorb the additional extension agents. These new extension Agents, as at the time of the data collection, had neither selected their contact farmers nor any educational programme initiated. Some had not reported to their new stations.

To solve this problem the previous operational areas were used. Before the unification and the implementation of the decentralisation process the district was divided into 15 operational areas, called Farmers Services Centres (FSC). Each FSC was staffed by an extension agent. The extension agent that had been working or worked in the FSC for the past one or more years were made reference to when it came to issues related to extension agents.

4.8.2. Contact Farmers:

There were some occasions where some contact farmers were changed by a succeeding extension agent and yet were selected for the study. In such occasions the contact farmers were interviewed with reference to the former extension agent and the information he delivered to them. In some occasions, the selected contact

farmer could not be located or found. In such situations the available contact farmer was used for the study.

4.8.3. Noncontact farmers:

Several other extension agents such as those of NGOs, were operating within the research area. These extension agents and those of the Ministry of Food and Agriculture extension agents (called, Agricultural extension agents to differentiate them from the other extension agents), all target the same clientele. As such, the respondents were often confused about which of the extension agent one was referring to when talking about extension agents. The green attire of the agricultural extension agents was used to distinguish the Agricultural Extension Agent (AEA) from the other extension agents who also provide extension messages.

4.8.4. Response:

Some respondents did not want to provide answers to some questions. The reason was that answering the questions would mean betraying the extension agent. In such situations one had to make inferences, repeat the question in another form afterwards or explain the purpose of the research and assure the respondent that the answers being provided were confidential.

4.8.5. Transportation and spatial distance:

Many of the operational areas were far apart. Because of this spatial distance and lack of transportation market days were relied upon to get in contact with the farmers. The result was an increased time frame for the data collection.

CHAPTER FIVE

RESULTS AND DISCUSSION

5.0 Introduction:

This chapter deals with the results of the study and discussion. It is organised into five parts. Part one deal with the demographic background of the respondents and part two, relevance of information. The other parts are Contact with information, cropping systems, and adequacy of information delivered and cropping systems.

5.1. Part One: Demographic Background

The demographic background, such as age, gender, marital status, and level of education of an individual is likely to influence his or her needs and perception. These demographic characteristics of the respondents are examined in this section

5.1.1 Age:

i. Contact farmers

It was found that the ages of the contact farmer respondents ranged between 22 and 65 years. Their modal age class were 40 and 55 years, with a mean age of 47.5 years. Most of them aged between 51 and 60 years (32%) and only 4% (2) below 31 years.

ii. Noncontact farmers:

The ages of the noncontact farmers ranged between 21 years and 65 years. Mean age was 43.4 and a modal age of 40 years. The age composition of all the respondents is provided in Figure 4.1. The mean age of the total respondents was 45 years with a modal age of 40 years.

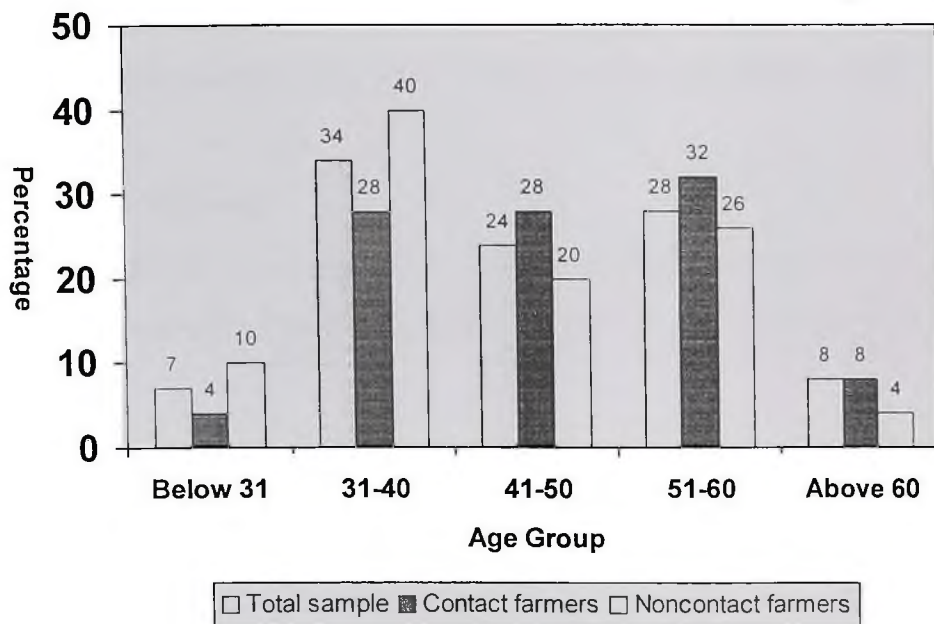


Figure 5.1. Distribution of farmers by Age

5.1.2 Gender:

i. Contact farmers:

In the study 84% (42) of the Contact farmers interviewed were male and 16% (8) were female. Since simple random sampling was used to select the contact farmers the lower number of female respondents was because of fewer women being contact farmers. It is an indication of low level of women involvement in agricultural extension education and the likelihood of misdirected female related farming activities such as planting and harvesting as reported by de Boer (1996). De Boer observed that, there is gender role in farming activities in Wa District. For instance men normally do land clearing, ploughing and weeding, while women do the planting and winnowing.

ii. Noncontact farmers:

The Noncontact farmers consisted of 74% (37) males and 26% (13) females. For both contact and Noncontact farmers the total sample consisted of 79% males and 21% females.

5.1.3 Marital Status

Contact and Noncontact farmers:

Ninety-two percent (46) of the contact farmers were married and the same number (46) of Noncontact farmers were also married. The details are shown in Table 5.1 below.

Table 5.1: Distribution of contact and noncontact farmer respondents by marital status

Marital Status	Contact Farmers		Noncontact Farmers		Total Respondents	
	Freq.	Percent.	Freq.	Percent.	Freq.	Percent.
Married	46	92	46	92	92	92
widow	3	6	1	2	4	4
Single	1	2	3	6	4	4
TOTAL	50	100	50	100	100	100

Source: *The Survey study*

5.1.4 Level of Education:

In the study it was found that majority of both contact and noncontact farmers, 78% and 70% respectively, did not attend school. Fourteen percent (14%) of the contact farmers and 10% of the Noncontact farmers ended their formal education at Junior Secondary School or Middle school (JSS/MS) level. The findings suggested low level of education of the respondents. This low level of education is likely to influence utilisation of technological information. This is because education influences the way farmers think about and solve problems. It provides skill for processing information (Eisemon, 1992), thereby providing individuals with a tool to accept positive changes.

The findings are summarised in Table 5.2 below.

Table 5.2: Distribution of contact and noncontact farmer respondents by level of education

Level Of Education	Contact Farmers		Noncontact Farmers		Total Respondents	
	Freq.	Percent.	Freq.	Percent.	Freq.	Percent.
None	39	78	35	70	74	74
Primary	3	6	5	10	8	8
JSS/Middle sch.	7	14	5	10	12	12
SSS/Sec Sch.	1	2	4	8	5	5
Tertiary			1	2	1	1
TOTAL	50	100	50	100	100	100

Source: *The Survey study*.

5.2. Part Two: Relevance of Information

This section sought to determine the relevance of information. It is organised under the following subheadings: Farmers participation in needs identification, Farmer extension agent relationship, Presentation of information, Timing of information, and Relevance of the information received.

5.2.1 Farmers' participation in needs identification.

When the contact farmer respondents were asked about their involvement in need identification, majority (74%), said they were not involved in need identification while 26% said they were always involved in their need identification. The responses are indicated in Table 5.3. This implies a significantly low level of farmers' participation in their need identification. This low level of participation is consistent with Albrecht et al (1989) contention that state development institutions (in this case extension services) fail to put participation into practice. They allow themselves to be seduced into authoritarian instruction-oriented behaviour towards the contact farmers.

However, involvement and participation of farmers in their needs identification is necessary to increase the relevance of extension messages to farm people's needs. It is also necessary for the extension agents to adjust the recommendations to meet the needs of the people thereby enhancing learning by the contact farmers. All these are necessary to increase the efficiency and effectiveness of extension delivery to the contact farmers. Therefore, the low level of contact farmers involvement will reduce the

relevance of the information, recommendations tend not to be suitable, thus, may reduce the efficiency of extension delivery

Table 5.3: Distribution of contact farmers by involvement in needs identification

Involvement in need identification	Frequencies	Percentages
Yes	13	26
No	37	74
Total	50	100

Source: The survey study

Since the objective of farmers participation is to make the extension messages relevant thereby solving their farming problems, the contact farmers were asked to state whether the information they received was able to solve their farming problems. Majority (62%), said it sometimes provide solutions to their needs and 36% of the contact farmer respondents said it always provide solutions to their needs. Details are shown in figure 5.2.

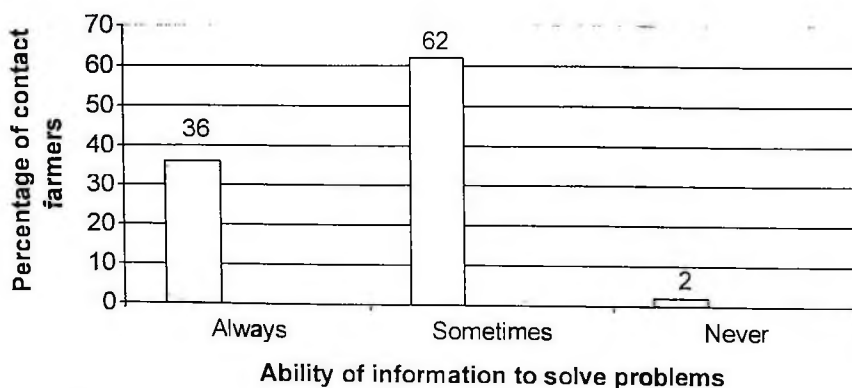


Figure 5.2: Percentage distribution of contact farmers by level of ability of information to solve problems

Since the objective of every extension activity is to provide solutions to farmers' problems, at least most of the time, majority of the contact farmer respondents saying it sometimes provides solutions does not indicate good extension delivery.

When the extension agents were asked about the involvement of their contact farmers in the planning process, majority (74%) indicated they were sometimes involved in the planning process. Thirteen percent (13%) said they were always involved in their need identification and the remaining 13% said they never involved their farmers. Figure 5.3 shows the percentage distribution of the extension agents according to the involvement of the contact farmers in need identification.

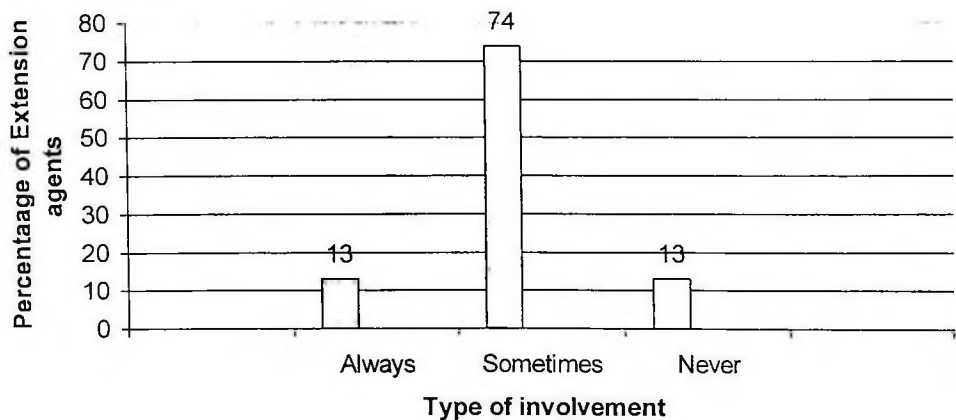


Figure 5.3: Distribution of extension agents according to type of involvement of contact farmers in needs identification

Source: The Survey study

To make the extension messages relevant to the contact farmers needs, the contact farmers must always be involved in their need identification. Therefore, 13% of the extension agents stating they always involve their contact farmers is an indication of low level of contact farmers involvement. This confirms the contact farmers assertion that majority of them were not involved in their need identification.

Majority (80%), of the extension agents also said they sometimes had time to listen to the farming problems of the contact farmers. Twenty percent (20%) said they always have time. The fact that up to 80% of extension agents said they only sometimes listen to farmers' problems is an indication that it is not mandatory and left at agents whims. A situation where agents may not care about farmers problems may not be productive, as such problems may hinder farmers interest in extension programme.

Majority (53%), of the extension agent respondents also indicated that the communication method they used sometimes allow for the incorporation of farmers problems in their extension programmes. A significant percentage (47%), also stated that the communication method always allow for the incorporation of the farmers' farming problems. (See Table 5.4)

Table 5.4: Distribution of extension agents by their listening and incorporating farmers' problems.

Listening tp & incorporating farming problems	Yes	No
Listen to farmers problems	20	80
Incorporate farmers problems	47	53

Source: *The survey study.*

One of the principles of extension as stated by Bradfield (1966) is that extension bases its programmes on people's needs. Therefore, a large proportion of the extension agents indicating they sometimes incorporate the farmers problems is not good. It further supports the fact that the contact farmers' involvement in need identification is low.

The study therefore, revealed that the contact farmer respondents participation in their need identification is low. Theoretically, this is not appropriate as one would have expected that farmer problem would form the basis of extension programme. However, the low involvement of the contact farmers is not strange, as this is one of the major weaknesses of the T & V extension system

5.2.2. Farmer extension agent relationship

a. Contact Farmer

The contact farmer respondents were asked to describe their relationship with the agent. Thirty percent (30%) described the relationship as very cordial. Sixty-four percent (64%) described it as cordial and 6% percent not cordial (Figure 5.4).

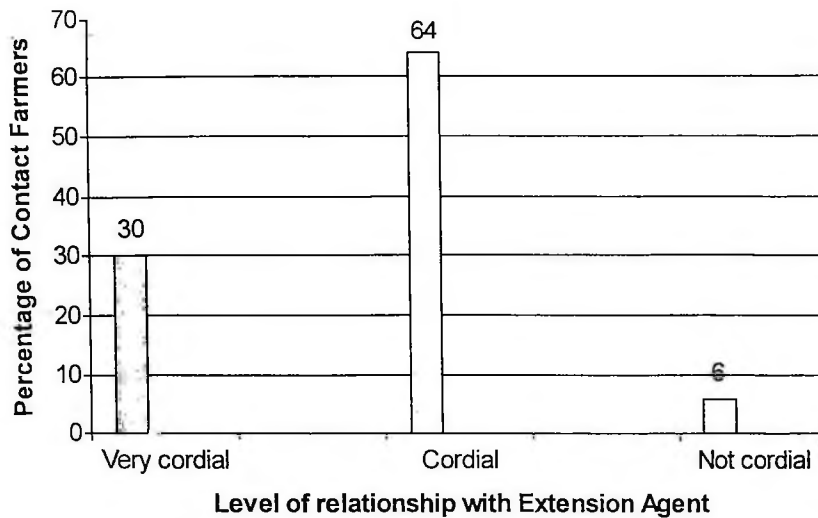


Figure 5.4: Percentage distribution of contact farmers by level of relationship with extension agent

From the study therefore, majority (94%) (cordial & very cordial) of the contact farmer respondents had cordial relations with the extension agent. This cordial relationship is necessary for the contact farmers to establish confidence with the extension agent, which is necessary for effective extension work. Albrecht et al, (1989) noted that successful extension work is not feasible on any other basis other than humanistic ethics. Whale (1989), also noted that a closer, more intensive relationship pays off in more effective adoption of new technology. Therefore, this cordial relationship would enhance the acceptance of extension messages.

When the contact farmers were asked to express their opinion about the extension agents visits, majority (96%), said they like being visited by the extension agent. The remaining 4% however, said they do not like being visited by the extension agent. This desire of majority of the contact farmers to be visited by extension agents further indicates the cordial relationship between the contact farmers and the extension agent.

Using Feder and Slade (1986) measure of demand for extension service, the desire by majority of the contact farmers to be visited by the extension agents also indicated a high demand for extension services. Feder and Slade measured the demand for extension by the frequency of interaction of farmers with extension agents.

b. Extension agents

The extension agents were asked to describe their relationship with their contact farmers. Sixty percent (60%) said there was cordial relationship between them and their contact farmers and 40% stated the relationship between them and the contact farmers was neutral.

Table 5.5: Distribution of extension agents by the relationship and co-operation of contact farmers

Responses		Frequency	Percentage
Relationship	Cordial	9	60
	Neutral	6	40
Co-operation of contact farmers	Sometimes	12	80
	Always	3	20

Source: The survey study

Majority of the extension agents stating that they had cordial relations with the contact farmers confirms the contact farmers' assertion that cordial relations exist between

them and the extension agents. This relationship is essential for good extension delivery. Albrecht et al, (1989: p.22) wrote that "only someone with a personal relationship with and affection for people and the reason he wants to assist will be able to do good work as an extension officer by helping not only to change and develop but also to preserve, nurture and restore." Therefore, majority of the extension agents having good relationship is likely to promote extension delivery. Further, majority (80%) of the extension agents said their farmers were sometimes co-operative while 20% indicated they were always co-operative. Majority of the extension agents indicating that their contact farmers were sometimes co-operative is not strange. One would not expect the contact farmers to be co-operative all the time.

5.2.3. Presentation of Information

When the respondents were asked to express their opinion about the extension agent, various responses were provided as indicated in Table 5.6. From the table it can be seen that majority of the respondents (94%) stated the AEA were always relaxed and takes his time and 88% said the visits were useful.

Table 5.6. Distribution of contact farmers by description of extension agents visits

Description of visit	Frequency	Percentage
Relaxed and takes his time	47	94
Visits are useful	44	88
Visits are not useful	2	4
Always in a hurry	1	2

There were multiple responses

Source: The survey study.

Fifty-eight percent (58%) of the contact farmers said they were given very much opportunity to express themselves during meetings, 26% said moderate opportunity was given and 16% said not much opportunity was given. Thus, majority was given opportunities to express and contribute at meetings. The opportunity to express themselves will lead to the incorporation of their farming problems, promote learning, and for the extension agent to adjust his technical recommendations to suit their contact farmers situation.

The contact farmers also mentioned the venue of meeting with the extension agent (see Table 5.7. below), 74% of them indicated they meet at home, 18% said they meet both at home and on the farm. To find out the mode of contact, as indicated in Table 5.7 seventy-two percent (72%) reported they meet in a group while 20% said the extension agent meet them both in a group and individually. Although the responses show that group meeting is the major mode of contact, it is not suitable in all situations. Group meetings may successfully promote awareness but they are woefully inadequate as a source of specific information that meets a particular farmer's needs (Blackburn, 1989). Majority (98%) of the contact farmer respondents liked the way information was passed on to them. This will promote receptiveness of extension messages.

Table 5.7: Distribution of contact farmers by mode of contact, place of meeting, participating at meetings, presentation

Mode of contact, Meeting place, Participation and presentation	Responses	Frequency	Percentage
Mode of contact	Individual	4	8
	Group	36	72
	Group & individual	10	20
Place of meeting	Home	37	74
	Farm	4	8
	Farm & home	9	18
Participating at meetings	Very much opportunity	29	58
	Moderate opportunity	13	26
	Little opportunity	8	16
Likeness of presentation	Yes	49	98
	No	1	2

Source: The survey study.

The most popular teaching method employed was demonstration (84%), speech/talk was the second most popular method. This is indicated in Figure.5.5. The indication is that, in the Training and Visit extension system practised in the district, the extension agents tend to employ demonstration, group meeting and discussion as the main teaching methods. Other means of communication such as visual and audio visual aids, which could be used to create awareness, are neglected.

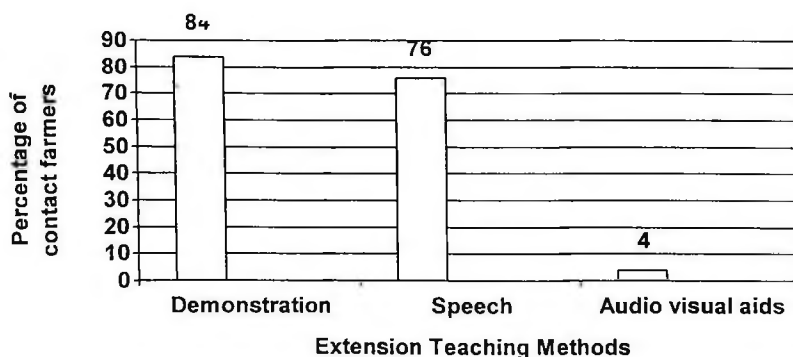


Figure 5.5: Percentage distribution of contact farmers by extension teaching method (N=50)

5.2.4. Interest in information

A greater proportion (70%) of the contact farmer respondents said they were always interested in the information they received from the extension agent (Table 5.8) The interest of farmers are their needs as perceived by themselves (Muller, 1993). Maunder (1972) also noted that the interest of the receiver (the contact farmer) are the things that are relevant to them. Therefore, majority of the contact farmers were interested in the messages because the content addressed their needs.

A significant proportion (30%) of the contact farmers also stated that they were sometimes interested in the messages they received from the extension agents. Gentile (1989) reported that farmers in many countries, including Ghana, have complex cropping systems and highly varied economic conditions. Under differing conditions one will not expect all the contact farmers to be interested in all the messages all the time

Table 5.8: Distribution of contact farmers by their interest in information.

Interest in information	Frequency	Percentage
Yes	35	70
No	15	30
Total	50	100

Source: The survey study.

5.2.5. Timing of information

a: Contact farmer respondents

Sixty-two percent (62%) of the contact farmer respondents said the information was usually received before the time they needed it. Thirty percent (30%) indicated the information was not timely because they received it before the time they needed or after the time they needed it. Albrecht et al (1989), wrote that a timely information should be sent well before the critical date. Table 5.9 indicates the responses. This shows that the information sent to the farmers was timely to majority (62%) of the contact farmers, which is in agreement with Albrecht et al (1997) assertion. Timing is however one of the key features of the training and visit extension system. Regular scheduled visits are made by the extension agents to contact farmers. These visits are made on fixed days known to both the contact farmers and the extension agents (Benor et al, 1984).

A significant proportion saying the information is not timely is not good enough since timing is the key feature of the training and visit extension system one would have expected the information to be more timely than the responses of the contact farmers indicated.

Table 5.9: Distribution of contact farmers by timing of information

Timing of information	Frequency	Percentage
Timely	31	62
Untimely	19	38
Total	50	100

Source: The survey study

b. Extension agent respondents

From the extension agents view point, 67% said the information was timely. Sixty percent (60%) also said their visits were sometimes announced while 40% said their visits were always announced. Again, 67% said when visits were announced, the visits were always made at the appointed time. In probing further, they were asked to state at what time of an operation the information of that operation was sent to the contact farmers. Sixty-seven percent (67%) said it was always sent before the operation starts while 33% said during the operation. The extension agent view is consistent with that of the contact farmers (See Table 5.10).

Table 5.10: Distribution of extension agents by their perception of the characteristics of information delivery.

Timing of information	Category	Freq.	Percent
Timing of information	Timely	10	67
	Not timely	5	33
Visits announced	Announced	9	60
	Not announced	6	40
Visits Made	Appointed time	10	67
	Not appointed time	5	33
Time information was sent	Before operation begins (timely	10	67
	After operation begins (not	5	33

Source: *The survey study*

5.2.6. Relevance of the information received**a. Contact farmer respondents**

As shown in Table 5.11, 44% of the contact farmers said the extension messages were not relevant while 34% and 22% said the information was relevant and very relevant respectively. Thus, majority 56%, (relevant and very relevant) found the information they received to be relevant. The success or failure of an extension

programme depends on the relevance of its content and the degree of popular interest it generates (Adams, 1990). Pickering (1989), noted that the T & V messages are relevant. He gave reasons why information under the T & V system is relevant. The T & V disseminate innovations and technical recommendations. It takes as its starting point the farm and its immediate difficulties and potential, addressing both food and cash crops to the extent that relevant information is available. The viewpoint of majority of the contact farmers about relevance of the information received is in agreement with the views of Pickering. Dejeney, (1989) reporting on his work done in Kenya also found that all the T & V contact farmers interviewed said that the recommendations they learned from their agent were relevant.

However, it is worth noting that a high percentage (44%) indicated that the messages are not relevant. This suggests that the messages were not relevant to the farmers. Adams, (1990) reported that the T & V approach is suitable only for homogenous conditions. The contact farmers live and operate under different and complex systems. They will, therefore, require different information at different times. As such, one may attribute the lack of relevance of the messages to 44% of the respondents to the lack of homogeneity in their conditions. It has also been reported in the staff appraisal report (Republic of Ghana, 1992) that in some cases the extension messages lack relevance. This finding suggests the lack of suitability of the Training and Visit system to heterogeneous conditions like that of the research area.

Under the training and visit system in Ghana, technologies recommended to farmers are simple uniform, and mono crop based and also limited to maize, sorghum, cowpea and rice (Rep. of Ghana, 1992). These are the crops grown by majority of the contact farmers in the research area. This might have contributed to the extension messages being relevant to majority of the contact farmers.

Table 5.11: Distribution of contact farmers by relevance of information received.

Relevance of information	Frequencies	Percentages
Not relevant	22	44
Relevant	17	34
Very relevant	11	22
Total	50	100

Source: The survey study

In probing further, as shown in Table 5.12 below, 42% said the information they received was satisfactory. Majority (56%) said the information was just satisfactory and 2% said it was not satisfactory. With majority of the contact farmers (56%) saying the information is just satisfactory and a high proportion (42%) also indicating the information was satisfactory, one can conveniently say that the information was satisfactory to majority of the contact farmers. This is consistent with the findings of Feder and Slade (1986) who found in their work done in Kairah state, India (where T & V was perfected after its initiation in Turkey) wrote that almost all contact farmers were aware of a change in extension operations and the change was beneficial.

Only 2% of the contact farmers indicated the information was not satisfactory. Feder and Slade reported that Moore (1984) and Jaiswal (1983) claimed that farmers see little benefit in the T & V system. This study does not agree with Moore and Jaiswal's claim.

Table 5.12: Distribution of contact farmers by level of satisfaction.

Level of Satisfaction	Frequency	Percentage
Satisfactory	21	42
Just satisfactory	28	56
Not satisfactory	1	2
Total	50	100

Source: *The survey study*

b. Extension agent respondents

The extension agents were asked to indicate whether the information was able to satisfy the needs of the contact farmers. The following responses in table 5.13 were provided.

Table 5.13: Distribution of extension agents by contact farmers' satisfaction with information

Contact farmers satisfaction with information	Frequencies	Percentages
Always	6	40
Sometimes	6	40
Never	3	20
Total	15	100

Source: *The survey study*.

From the table it can be seen that 40% of the extension agents' view was consistent with that of majority of the contact farmers that the T & V messages were satisfactory. Forty percent (40%) said it was sometimes satisfactory while 20% said it was never satisfactory. In finding out why the information do not or only sometimes satisfy the information needs of the target group, the following reasons were mentioned as the reasons for the information not being satisfactory or not satisfactory sometimes -

- i. Unavailability of inputs to combine with information
- ii. Some information does not meet the needs of the farmers
- iii. Lack of credit to the farmers
- iv. High extension farmer ratio - fewer extension agents for too many farmers
- v. The group concept is difficult to work in some communities

From the study, one can conclude that lack of involvement of the contact farmers in their need identification is likely to be a contributory factor to some of the information not meeting the contact farmer respondent needs.

This was confirmed by the fact that programmes are planned at headquarters in consultation with the regional extension agents and executed at the district level by the District Officer and AEAs (Rep. of Ghana, 1992). Input availability to the farmers is also necessary for success of the extension system. It was stated by Hulme (1991), that even in India, where the T & V was perfected, despite formal job statements, the extension agents were widely involved with input supply.

5.2.7. Relevance of Information and Social Characteristics of contact farmer respondents.

It is important for information to be relevant to the clients' situation. It is also likely that the social characteristics of the client influence the client's situation and therefore the relevance of the information. The social characteristics dealt with are age, gender, marital status and education.

5.2.7.1. Age and relevance of information

Relevance of information was cross-tabulated with the age of the contact farmer. The frequencies and percentages are presented in Table 5.14. From this, the chi-square analysis shows that there was no relationship between those above and those below the average age of the contact farmers (47.5) ($\chi^2=0$, $p>0.05$). What it means is that relevance of an information does not depend on the age of the contact farmer. Theoretically, younger adults tend to look for more information than older adults. Onu (1991) reported that information source use declines with increasing age. It is also worth noting that in the theory of diffusion (Bohlen, 1966) the laggards are the aged. One would have expected a significant difference between the two age groups which is not the case in this study. This is probably due to the fact that both age groups operate under the same environmental conditions.

Table 5.14: Distribution of contact farmers by age and relevance of information.

Relevance of information	Age			
	Below average		Above average	
	Frequency	Percentage	Frequency	Percentage
Not relevant	11	44	11	44
Relevant	14	56	14	56
Total	25	100	25	100

$\chi^2 = 0$ $df = 1$ $p=1$ (NS)

5.2.7.2: Gender and relevance.

Table 5.15 shows the relationship between gender and relevance of extension messages to contact farmers. It was found that 48% of the males indicated the information was not relevant while 25% of the females indicated it was not relevant.

It was also observed that 75% of the females indicated it was relevant while 52% of the males indicated it was relevant. It was therefore found that the information was relevant to a greater percentage (75%) of the females than the male respondents (52%). However, the difference was not statistically significant ($\chi^2 = 1.4$, $p>0.05$), implying that the relevance of an information does not depend on the gender of the contact farmer. De Boer (1996) reporting on his work done in the research area, noted that women cultivate cash crops while the men cultivate staple food crops. These cash crops are often mono-cropped making the cropping somewhat homogeneous. Thus, making their farming better suitable for the Training and Visit system (Adams, 1990

Table 5.15: Distribution of contact farmers by relevance and gender

Relevance	Gender			
	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Not relevant	20	48	2	25
Very relevant	22	52	6	75
Total	42	100	8	100

$$\chi^2 = 1.4 \quad df = 1 \quad p = 0.24 \quad (\text{NS})$$

5.2.7.3: Marital status and relevance of information.

In matching marital status with relevance of information (Table 5.16), it was noted that 59% of those who were married indicated that the information was relevant. Seventy five percent of those who were single said it was relevant. Proportionately, more married respondents (59%) said it was relevant than those who were single. However, there was no significant relationship between marital status and relevance of extension messages ($\chi^2 = 1.7$, $p > 0.05$). Since married people have a greater responsibilities, such as feeding the whole family, one would expect that they will be unwilling to try new ideas while the unmarried can venture into new ideas with less risk. Thus, creating a significant difference in their perception of the extension messages received. However, since both groups are confronted with similar environmental conditions and received similar extension messages one would not expect any significant difference between them.

Table 5.16: Distribution of contact farmers by marital status and relevance of information

Relevance of information	Marital status			
	Married		Single	
	Freq	Percent	Freq	Percent
Not relevant	19	41	3	75
Relevant	27	59	1	25
Total	46	100	4	100

$\chi^2 = 1.7$ $df = 1$ $p=0.19$ (NS)

5.2.7.4 Education and relevance of extension messages.

From the study it was noted that more of those who had no formal education (46%) indicated the messages they received were not relevant than those who had formal education (40%). Fifty four percent of the respondents who had no formal education also indicated that the information was relevant. Sixty percent of those who had formal education said the information was relevant. Details of the responses are provided in Table 5.17. It was found that the extension messages delivered were more relevant to those who had formal education (60%) than those who had no formal education (54%). It was however, found that there was no statistically significant relationship between relevance of information and educational level of the respondents ($\chi^2 = 0.14$, $p>0.05$). This result implies that the contact farmers' educational level tells nothing about the relevance of information received from the extension agent. Theoretically, people who had education have a greater ability to interpret and apply information and would therefore see the information to be more relevant than those who had not been to school.

Table 5.17: Distribution of contact farmers by relevance of information and educational level.

Relevance of information	Educational level			
	No formal		Formal	
	Freq	Percent	Freq	Percent
Not relevant	16	46	6	40
Relevant	19	54	9	60
Total	35	100	15	100

$$\chi^2 = 0.14 \quad df = 1 \quad p=0.1 \quad (NS)$$

5.2.8. Influence of Presentation, Timing, Relationship, Interest, and need identification on Relevance of Information.

This subsection sought to find out whether the mode of presentation of an information, timeliness of the information, interest in the information, involvement in the need identification and nature of relationship existing between the client and the extension agent has any impact on the relevance of information presented to them.

5.2.8.1. Need identification and relevance of information

From the study, it was revealed that 15% of those who were involved in their need identification said the information was not relevant while 85% of them said it was relevant. Fifty-four percent (54%) of those who were involved in their need identification said the extension messages were not relevant while 46% of them said it was relevant. The difference was statistically significant ($\chi^2 = 5.6, p < 0.05$). Thus, there is a significant relationship between the contact farmers involvement in need identification and the relevance of information received by the contact farmers. Table 5.18 below provides the details.

Table 5.18: Distribution of contact farmers by relevance and need identification.

Relevance of information	Involvement in need identification			
	Involved		Not involved	
	Freq	Percent	Freq	Percent
Not relevant	2	15	20	54
Relevant	11	85	17	46
Total	13	100	37	100

$$\chi^2 = 5.6 \quad df = 1 \quad p=0.02 \quad (S)$$

It was therefore, found that the extension messages delivered to the contact farmer respondents was more relevant to those who were involved in their need identification (85%) than those who were not involved. This implies that the relevance of extension messages to the contact farmers depends on the involvement of the contact farmers in their need identification. This is consistent with the work of Axinn, (1988), who noted that farmers' involvement and active participation in need identification is to increase the relevance of the extension messages to them.

5.2.8.2: Presentation and relevance

It was found that majority of those respondents who said they liked the way information was presented to them (57%), also said the information was relevant. Forty three percent however said it was not relevant to them. Table 5.19 above shows the findings. It was found that there was no statistical significant relationship between relevance and presentation of extension messages ($\chi^2 = 1.29, p>0.05$). Therefore, the relevance of a message does not depend on its presentation. Presentation as noted by Maunder

(1972), does influence the receivers understanding of the message. It also makes the message interesting or boring.

Table 5.19: Distribution of Contact farmers by their perception of presentation and relevance of information

Relevance of information	Perception of Presentation			
	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Not relevant	21	43	1	100
Relevant	28	57	0	0
Total	49	100	1	100

$\chi^2 = 1.29$ $df = 1$ $p=0.25$ (NS)

5.2.8.3. Farmers Relationship with extension Agent and relevance of information

When relationship and relevance of extension messages were cross tabulated, it was found that 45% of those who had cordial relationship with the AEAs said the information was not relevant and 55% of them said it was relevant. Sixty seven percent (2) of those who said they had no cordial relationship said the information was relevant while 33% (1) said it was not relevant. No significant statistical relationship was found between farmers relationship with the extension agent and the relevance of information send to the respondents ($\chi^2 = 0.2$, $p>0.05$). Table 5.20 provides the details.

Table 5.20: Distribution of relevance and relationship with extension agent.

Relevance of information	Relationship with extension agent			
	Not cordial		Cordial	
	Frequency	Percentage	Frequency	Percentage
Not relevant	1	33	21	45
Relevant	2	67	26	55
Total	3	100	47	100

$\chi^2 = 0.15$ $df = 1$ $p=0.7$ (NS)

Thus, it is concluded that the cordiality of relationship between the contact farmers and the extension agents does not result in farmers having access to relevant information. It however, makes it easier for the contact farmer to approach the extension agent. It also enhances the credibility of the extension agent.

5.2.8.4. Timing of information and its relevance

In finding out the influence of the timing of information delivery and its relevance to the farmer, timeliness and relevance were cross tabulated. Sixty-eight percent (68%) of those who found the information timely also found it relevant to their situation. Thirty two percent (32%) of them indicated the information was not relevant. It was observed that 63% of those who said the information was not timely also said it was not relevant. The details are shown in Table 5.21 below.

Table 5.21: Distribution of contact farmer respondents by timing and relevance of information.

Relevance of information	Timing of information			
	Timely		Not timely	
	Frequency	Percentage	Frequency	Percentage
Not relevant	10	32	12	63
Relevant	21	68	7	37
Total	31	100	19	100

$\chi^2 = 4.56$ $df = 1$ $p=0.03$ (S)

The information received was relevant to majority of those that found the information timely (68%) while not relevant to majority of those that found the information not to be

timely (63%). It was also noted that there was a statistical significant relationship between timing of information and its relevance ($\chi^2=4.56$, $p<0.05$) implying that the timing of information has influence on the relevance e of information. Blackburn (1989), noted that the meaning a technology has for a farmer varies from one point in time to another. Therefore, for an information to be relevant it must be timed in such a way that it has meaning for the farmer. As such, those who found the information relevant are likely to be those who found it properly timed.

It was noted that 97% of those who found the information timely also said it was useful. Seventy four percent (74%) of those who said the information was not timely also noted that it was useful while 26% noted it was not useful. There was a statistically significant relationship between timeliness of information and its usefulness ($\chi^2=5.6$, $p<0.05$). This confirms that because the information was properly timed, the recipients were able to use it and therefore found it useful.

Table 5.22: Distribution of contact farmers by usefulness and timing of information

Usefulness of information	Timeliness of information			
	Timely		Not timely	
	Frequency	Percentage	Frequency	Percentage
Useful	30	97	14	74
Not useful	1	3	5	26
Total	31	100	19	100

$\chi^2=5.6$ $df=1$ $p=0.02$ (S)

5.2.8.5: Interest in information and its relevance.

When interest in the information received was cross tabulated with relevance of information, 51% of those that indicated they were always interested in the information said it was not relevant while 49% said it was relevant. Twenty seven percent (27%) of those that indicated they were sometimes interested in the information said it was not relevant. Seventy three percent of them (73%) said it was relevant (Table 5.23 below)

Table 5.23: Distribution of contact farmers by interest in information and its relevance

Relevance of information	Interest in information			
	Always interested		Sometimes interested	
	Frequency	Percentage	Frequency	Percentage
Not relevant	18	51	4	27
Relevant	17	49	11	73
Total	35	100	15	100

$$\chi^2 = 2.6$$

$$df = 1$$

$$p = 0.1$$

(NS)

It was found that more of those who were sometimes interested in the information (73%) said the information was relevant than those who said they were always interested in the information. It was noted there was a relationship between interest in information and its relevance ($\chi^2 = 2.6, p > 0.05$). This implies that relevance is independent of interest. Rather, an information will have to be relevant to elicit interest. The purpose of making an information relevant is to make it suitable to the contact farmer thereby arousing his interest in the information.

It was found that there was a significant relationship between relevance and need identification as well as timing of information (see Table 5.24). This means that

relevance of information to the Contact farmers depends on their involvement in their need identification and the timing of presentation of the information. This means that the relevance of information depends on involving the contact farmers in their need identification and timing the information in such a way that meets the contact farmers needs. Theoretically it has been accepted that, to make information relevant and acceptable to the receiver (the contact farmers), the receiver must be involved and actively participate in the information need assessment. The Training and Visit is however, criticised for its top-down approach. The training and visit has regular scheduled visits as one of its basic principles. This can contribute to the relevance of information to the contact farmers. However, there was no significant relationship between relevance of information and relationship with the AEA, presentation of information, education, interest in information, age and marital status. From theory these factors contribute to the understanding interest and acceptance of the information.

Table 5.24: Summary table of chi-square values and probability values

Relevance of information by	Chi-square (χ^2) value	'P' value	Significant (S)/ Not Significant(NS)
Age	0	1	NS
Gender	1.4	0.24	NS
Marital status	1.7	0.19	NS
Education	0.14	0.1	NS
Farmers need identification	5.6	0.02	S
Presentation of information	1.29	0.25	NS
Farmer Relationship with AEA	0.15	0.7	NS
Timing of information	4.56	0.03	S
Farmers Interest in information	2.6	0.1	NS

Source: *The survey study.*

5.3. Part Three: Noncontact Farmers Contact with Extension Messages

Noncontact farmers contact with extension messages is indicated by Knowledge about AEAs, mode of receiving information, type of information received, and relevance of the information

5.3.1 Knowledge about AEA and contact farmers

Table 5.25 indicates the percentage distribution of the noncontact farmers according to their knowledge of the extension agent, the work the extension agent does, knowledge about contact farmer and information received from the contact farmers.

Table 5.25: Distribution of contact farmers by knowledge about AEA, AEA's work, Contact farmer, and information received from contact farmer

Knowledge about AEA, AEAs' work, contact farmer, and information received.	Yes		No	
	Freq	Percent	Freq	Percent
Knowledge about AEA	42	84	8	16
Knowledge about the work of the AEA	37	74	13	26
Knowledge about contact farmer	26	52	24	48
Information received from contact farmer	5	10	45	90

Source: *The survey study.*

The noncontact farmers were asked whether they know the extension agent that operate in their area. Majority (84%), of them said they knew the agricultural extension agent. Seventy four percent (74%) of them also knew the kind of work he does. Thus, knowledge about the extension agent and the kind of work he does was high among the noncontact farmers. This high knowledge is likely to promote direct contact with extension messages since it will be easier for the noncontact farmers to consult the

extension agent. This is because Feder and Slade (1986) noted that, the easier it is to consult extension agent, the more likely the extension agent was to be the source of information. However, the findings of this study indicates that, in spite of the high knowledge about the extension agent and his work by the noncontact farmers, majority of the noncontact farmers (90%) did not receive information from the extension agent (see Table 5.25)

The noncontact farmers knowledge about contact farmers (farmers the extension agents visit) was also found to be high (52%). It was however, noted that majority of the noncontact farmers (90%) did not receive information from the contact farmers (Table 5.25). The 10% that received information from the contact farmers include those who received information from the extension agent as well. Thus, from the responses the information does not flow from the contact farmers to the noncontact farmers.

These findings are supported by Albrecht et al., (1989). They wrote that experience had shown that, the flow of information frequently stops at the contact farmer level or a few farm families profit from the information flow. It has also been observed by Moore (1984), and Jaiswal (1983), as reported by Feder and Slade (1986), that in many parts of India covered by T & V, farmers see little benefit in the system and that noncontact farmers may not even know that there were contact farmers. The implication is that, the farmer-to-farmer information exchange necessary to cause information to trickle down does not take place sufficiently between the contact farmers

and noncontact farmers. Diffusion of innovations will be limited under such circumstances.

5.3.2. Mode of receiving information by noncontact farmers.

The twenty-two percent (11) that indicated they received information from the contact farmers, gave various ways in which they received the information. This is shown in Figure 5.6 below. Majority (90%) of those noncontact farmers, who received information, received it during farmers meetings. Forty-five percent (45%) made office calls. This suggests that demand driven extension existed between these noncontact farmers and the extension agent. Feder and Slade (1986) suggested that, interaction between noncontact farmers and extension agents is likely to be determined by demand from noncontact farmers

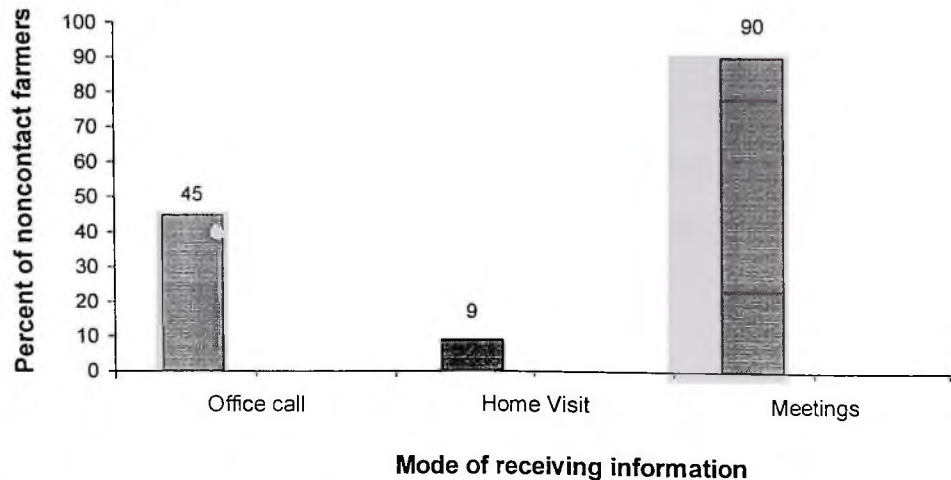


Figure 5.6: Percentage distribution of noncontact farmers by mode of receiving information

.Source: The survey study

5.3.3. Type of information received by noncontact farmers

When it was enquired to know from the noncontact farmers, who received information from the contact farmers, what sort of information they received, three categories of information were provided. These were information about farming, about credit and group formation. Frequencies and percentages of responses are shown in table 5.26 below.

Table 5.26: Distribution of contact farmers who received information by information received (N=11).

Type of Information	Frequency	Percentage
Farming	11	100
Credit	1	9
Group formation	2	18

Source: The survey study.

From the table it can be noted that all the eleven farmers, who received information from the contact farmers, received information about farming - an indication that only production recommendations were delivered. This is consistent with the Training and Visit system principle that extension agents are only responsible for production recommendations (Benor et al, 1984).

5.3.4. Relevance of information

When the contact farmers that received information were asked about their judgement of the relevance of the information they received from the contact farmers, 37% of

them said the information was just relevant and 63% said it was very relevant. Thus, majority of the farmers found the information obtained relevant. Ninety percent (90%) of them also said they shared the information with other farmers. The other farmers expressed interest in the information they shared with them, 45% of the respondents said sometimes and another 45% said always (see table 5.27 below).

Table 5.27. Distribution of noncontact farmers who received information with regards to relevance, sharing of information with others and interest in information.

Relevance, sharing and interest in information		Frequency	Percentage
Relevance	Just relevant	4	37
	Very relevant	7	63
Share information with others	Yes	10	90
	No	1	10
Interest in information by others	Always	5	45
	Sometimes	5	45
	No	1	10

Source: The survey study.

In summary, majority (84%) of the non-contact farmers knew the extension agent. Seventy-four percent (74%) knew the kind of work he does. Majority (52%) also knew the contact farmers in their area. Only 22% received information from the contact farmers in their respective areas. Majority (90%) of those who received the information, received it during farmers meetings. All those who received information from the contact farmers (22%) found the information relevant to them. Information flow from the contact farmers to noncontact farmers was however, very low.

5.4. Part Four: Cropping Systems

To minimise losses due to unfavourable weather conditions, diseases and pest, and to obtain a variety of products, many crops are planted in any one season. It is unlikely that many different species of crops will be subjected to the same amount of damage in any one year (Reijntzes et al, 1981). This section sought to determine the cropping systems, types of crops grown, livestock reared and those crops and animals on which extension messages were received.

5.4.1 Crops cultivated

The study found that different crops were planted within the same season. The major crops cultivated in the District as indicated in Table 5.28, were cowpea (87%), sorghum (86%), maize (86%), groundnuts (80%), millet (79%), and yam (76%). Minor crops cultivated included rice (40%), cashew (28%), soybeans (34%), cassava (40%), bambara beans (10%) and vegetables (okra, tomato, pepper and pumpkin) (34%). The implication of cultivating so many different crops is that, different information will be required at different times since the agronomic practices are not exactly the same and period of the various cultural practices differ.

Table 5.28: Distribution of contact and noncontact farmers by crops cultivated

Crops cultivated	Contact farmer		Noncontact farmer		Sample total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Sorghum	7	94	39	78	86	86
Cowpea	46	89	41	82	87	87
Maize	43	86	43	86	86	86
Millet	42	84	37	74	79	79
Yam	42	84	34	68	76	76
Groundnut	40	80	40	80	80	80
Rice	20	40	20	40	40	40
Cashew	19	38	9	18	28	28
Soy bean	16	32	18	36	34	34
Vegetables	12	24	22	44	34	34
Cotton	24	48	22	44	46	46
Cassava	15	30	20	40	35	35
Bambara beans	3	6	8	16	11	11

Source: The survey study

5.4.2 Crop mixture

From the study, 12 major different crop mixtures (two or more crops planted on the same piece of land) were identified. There were other crop mixtures that were identified but these other crops were considered not important because the frequency of responses was small. These crop mixtures and the frequency of responses are tabulated in Table 5.29 below. From the table, it can be noted that the major crop mixtures planted were cowpea and sorghum (70%), maize and sorghum (57%), yam and millet (49%) and groundnut and millet (35%). The table indicates both the responses of contact farmers and noncontact farmers as well as the mean acreage of the multiple crops. The numerous multiple crops planted at the same time indicate the complexity of the information needs of the farmer respondents since information on innovations on all crops will be required.

Table 5.29: Distribution of contact and noncontact farmers according to crop mixture cultivated

Crop mixtures cultivated	Contact Farmers		Noncontact Farmers		Sample Total	
	Freq	%	Freq	%	Fre	%
Cowpea and sorghum	36	72	34	68	70	70
Maize and sorghum	31	62	26	52	57	57
Yam and millet	24	48	25	50	49	49
Groundnut and millet	15	30	20	40	35	35
Groundnut and sorghum	5	10	7	14	12	12
Maize and rice	5	10	2	4	7	7
Cowpea and millet	4	8	7	14	11	11
Sorghum and millet	2	4	1	2	3	3
Yam and cassava	2	4		-	2	2
Yam, okra and millet	2	4	2	4	4	4
Yam, okra, millet and Bambara beans	2	4	-	-	2	2
Bambara beans and sorghum	1	2	-	-	1	1

Source: The study.

5.4.3 Sole cropping

Sole cropping is the method where only one crop is grown in a field at any one time.

Mechanisation use of pesticides and timing of cultural operations are easier to determine with only one crop in the field. (Hall et al, 1979). Sole cropping has become the trend in the development of farming. This cropping system was also identified with both contact and noncontact farmers. Table 5.30 provides the findings.

Table 5.30. Distribution of farmer respondents by crops grown as sole crops

Crop	Contact Farmer		Noncontact Farmer		Sample Total	
	FREQ	%	FREQ	%	FREQ	%
Maize	25	50	11	22	36	36
Groundnut	19	38	18	36	37	37
Sorghum	12	24	16	32	28	28
Millet	7	14	1	2	8	8
Yam	7	14	5	10	12	12
Rice	11	22	9	18	20	20
Cowpea	6	12	6	12	12	12
Cashew	3	6	2	4	5	5
Soy bean	9	18	13	26	22	22
Cotton	8	16	4	8	24	24

Source: The survey study

From the table, it was noted that groundnut (37%), maize (36%), sorghum (28%) and soybean (22%) were the most common crops planted as sole crops by both contact and Noncontact farmers. It is also worth noting that 24% of the total sample were cultivating cotton as a sole crop. Cotton is however a specialised commodity, information on which is presented by either the Ghana Cotton Company (GCC) or Plantations Development Limited (PDL). It was noted that more contact farmers cultivate sole crops than noncontact farmers as indicated by the total frequencies of 107 and 85 respectively.

The approximate land holding (mean acreage) by the contact farmers and noncontact farmers was found to be 3.2 for multiple crops, and sole crop 2.66. The findings are shown in Table 5.31.

Table 5.31 Average land holdings of contact and Noncontact farmers in acres by cropping system

Cropping System	Contact Farmer	Noncontact Farmer	Total mean acreage
Multiple cropping	3.26	3.14	3.2
Sole cropping	3.23	2.08	2.66
TOTAL	3.25 (=1.31 ha)*	2.61 (=1.06 ha)*	2.93(= 1.19 ha)*

**Sum of the mean acreage of the cropping systems*

From the table, the contact farmers put more land under cultivation (3.25) than the noncontact farmers (2.61). The total mean acreage put under cultivation by the farmers sampled was found to be 2.93 acres (1.19 hectares).

5.4.4. Cropping Systems

In categorising the respondents into distinct cropping systems it was found that 14% of the contact farmer respondents were practising only multiple cropping while 26% of the noncontact farmer respondents were practising only multiple cropping. Thus, more noncontact farmer respondents (26%) were practising only multiple cropping than the contact farmer respondents (14%). It was noted that more contact farmers were practising only sole cropping (26%) as compared to noncontact farmer respondents (8%). A greater percentage of the noncontact farmer respondents (66%) were also found to practise both multiple and sole cropping than the contact farmer respondents (62%). Table 5.32 shows the details.

Table 5.32: Distribution of contact and noncontact farmers by cropping systems

Cropping System	Contact Farmers		Noncontact Farmers	
	Freq.	Percent.	Freq.	Percent.
Only multiple cropping	7	14	13	26
Only sole cropping	13	26	4	8
Both multiple and sole cropping	30	60	33	66
TOTAL	50	100	50	100

Source: The survey study

For the purpose of this study, the respondents were re-classified into those practising multiple cropping only and those that practice only sole cropping. Thus, those who practice both sole and multiple were considered multiple croppers. On this basis Table 5.33 provides the cropping systems, frequencies and percentages for both contact and noncontact farmers and that of the total sample.

Table 5.33: Distribution of respondents by nature of contact and cropping system

Cropping systems	Mode of contact				Total sample	
	Contact farmers		Noncontact farmers		Freq.	Percent
	Freq.	Percent	Freq.	percent		
Multiple cropping	38	76	46	92	84	84
Sole cropping	1	24	4	8	16	16
Total	50	100	50	100	100	100

$\chi^2 = 3.47$ $df = 1$ $p = 0.05$ (S)

From the table, it can be seen that the major cropping system practised in the district was multiple cropping (84%), where two or more crops were planted together on the same piece of land. It can also be noted that more noncontact farmers (92%) were practising multiple cropping than contact farmers (74%). There is a significant

difference between the contact farmers and noncontact farmers in relations to the cropping systems practised ($\chi^2=3.47$, $p>0.05$). This difference results from the contact with extension agents since the sole cropping is promoted by the extension agents. These cropping systems, multiple cropping and sole cropping were also identified by the department of Agricultural extension as the cropping systems practised in the District (D.A.E.S, 1997). De Boer (1996) also noted multiple cropping to be the dominant practice in the district. Multiple cropping has been the practice of the people of the District before the inception of the T & V and it was still practised. The respondents continued with this practice probably as a result of ecological limitations such as climatic factors, the inputs and technologies at his disposal. Reijntzes et al (1993), and Komalafe et al (1981), also noted that the practice has its peculiar advantages. There is higher harvestable product per unit area as compared to sole crop, failure of one crop to produce can be compensated by the other crop.

5.4.5. Livestock production

From the study, it was found that 96% of the contact farmer respondents were keeping livestock and 4% were not keeping any kind of livestock. Seventy six percent of the Noncontact farmer respondents were also keeping livestock while 24% were not keeping any livestock. Fourteen percent of the total sample was not keeping any livestock. Thus, a greater number of contact farmer respondents (96%) were keeping livestock than noncontact farmer respondents (76%) (Table 5.34. below)

Table 5.34: Distribution of contact and noncontact farmers by livestock farming

Livestock farming	Contact farmers		Noncontact farmers		sample Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	48	96	38	76	86	86
No	2	4	12	24	14	14
Total	50	100	50	100	100	100

Source: The survey study.

It was found that, fowls (71%), goats (57%), cattle (45%) and guinea fowls (45%) were the animals mainly raised by both the contact and noncontact farmer respondents. Table 5.35 indicates the responses.

Table 5.35: Distribution of the contact and noncontact farmers by livestock reared

Livestock reared	contact farmers		noncontact farmer		Sample total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Fowls	38	76	33	66	71	71
Goats	33	66	24	48	57	57
Cattle	27	54	18	36	45	45
Guinea fowls	20	40	21	42	41	41
Sheep	14	28	11	22	25	25
Pigs	10	20	8	16	18	18
Ducks	11	22	7	14	18	18
Rabbits	2	4	0	0	2	2
Turkey	2	4	4	8	6	6

Source: The survey study.

From the study it has been noted that the Contact farmers:

- practise a greater variation of cropping mixtures than Noncontact farmers.
- had larger areas of multiple crops than Noncontact farmers
- cultivate more sole crops than Noncontact farmers
- cultivate larger areas than Noncontact farmers
- a greater number of them keeping livestock than noncontact farmers.

More noncontact farmers practise multiple cropping than contact farmers. This suggests that the contact farmers are more wealthy or successful than the noncontact farmers. This is because from the researchers experience farmers who are wealthier are often chosen as contact farmers and this could be the result of the above findings.

From this study, two main cropping systems were identified, these are the multiple cropping and sole cropping systems. It was noted that a greater percentage of noncontact farmer respondents were practising multiple cropping than contact farmer respondents. A greater percentage of contact farmer respondents were practising sole cropping than noncontact farmer respondents. Though different varieties of crops were planted in one season the major crops grown by the respondents were cowpea (87%), sorghum (86%), maize (86%), groundnut (80%), millet (79%) and Yam (36%).

The most important crop mixture planted as multiple crops was cowpea and sorghum mixture 57%. Groundnut was also found to be the major crop planted as sole crop.

The study revealed that the major livestock owned by the people were fowls (71%) goats (57%), cattle (45%) and guinea fowls (45%). More contact farmers (96%) owned livestock than noncontact farmers (76%). Eighty six percent of the total sample owned livestock.

5.4.6 Social Characteristics of Respondents and Cropping Systems practised.

The social characteristics indicated here are age, gender, marital status, and education.

5.4.6.1 Age and cropping systems

In the study, it was discovered that 76% of the respondents below the average (47.5) and 72% of those above the average (47.5) were practising multiple cropping. Twenty four percent of those below the average were also practising sole cropping while 28% of those above average were practising sole cropping. Table 5.36 below presents the findings. Thus, more of those below average age of the contact farmers (47.5) were practising multiple cropping than those above average and those above average were also practising sole cropping than those below average. The difference between the two age groups with regards to the type of cropping system practised was not significant ($\chi^2 = 0.1$ $p > 0.05$). This means that the type of cropping system practised does not dependent on age. Since both age groups are confronted with the same environmental conditions, it is usual for them to adopt the same or similar solutions to reduce risk.

Table 5 36: Distribution of contact farmers according to age by cropping system

Cropping system	Age			
	Below average(47.5)		Above average(47.5)	
	Frequency	Percentage	Frequency	Percentage
Multiple cropping	19	76	18	72
Sole cropping	6	24	7	28
Total	25	100	25	100

$$\chi^2 = 0.1 \quad df = 1 \quad p=0.74 \quad (NS)$$

5.4.6.2. Gender and Cropping Systems

To ascertain whether there was any difference between male and female respondents with regards to the cropping systems practised, gender was cross tabulated with cropping systems. It was observed that, 83% of the males and 25% of the females were practising multiple cropping. Seventeen percent (17%) of the males were practising sole cropping while 75% of the females were practising sole cropping. More females (75%) were therefore found to practise sole cropping than males (17%). More males (83%) also practise multiple cropping than females (25%). The difference between the two sexes in relation to cropping system was found significant ($\chi^2 = 11.9$, $p < 0.05$). Table 5.37 provides the details. The difference results in majority of the women practising sole cropping whilst the men practice multiple cropping. De Boer (1996), noted that women grow cash crops and men are responsible for the production of staple food crops. This could be the reason why majority of the women was practising sole cropping resulting in the significant difference. It also suggests that information delivered to the contact farmers was more relevant to the sole crop farmers since the women were practising sole cropping.

Table 5.37: Distribution of contact farmers according gender by cropping system practised

Cropping system practised	Gender			
	Males		Females	
	Frequency	Percentage	Frequency	Percentage
Multiple cropping	35	83	2	25
Sole cropping	7	17	6	75
Total	42	100	8	100

$$\chi^2 = 11.9 \quad df = 1 \quad p=0.0006 \quad (S)$$

5.4.6.3. Marital status and cropping systems

To compare marital status in relation to the cropping systems, single and widows were combined as single (Table 5.38). It was detected that 74% of the married respondents were multiple croppers. Seventy five percent (75%) of the single respondents were multiple croppers. Twenty six percent (26%) of the married respondents were also practising sole cropping. It was noted that there was no statistical difference between the married and the non-married respondents ($\chi^2 = 0.4$, $p>0.05$). It implies that marital status has no influence on the cropping system practised by the contact farmer respondents. Cropping system is as a result of the response to climatic conditions and to ensure against loss. As such it is not influenced by marital status.

Table 5.38: Distribution of contact farmer according to marital status by cropping system practised.

Cropping system	Marital Status			
	Married		Single	
	Frequency	Percentage	Frequency	Percentage
Multiple cropping	34	74	3	75
Sole cropping	12	26	1	25
Total	46	100	4	100

$$\chi^2 = 0.4 \quad df = 1 \quad p=0.96 \quad (NS)$$

5.4.6.4. Education and Cropping system

In the study, it was detected that 77% of those respondents who had not attended school were practising multiple cropping. Twenty three percent (23%) of them were practising sole cropping. It was also found that, 67% of those who had formal education were practising multiple cropping and 33% of them were practising sole cropping. It was, therefore, found that more of those who had no formal education were practising multiple cropping than those who had formal education. Also, more of those who had formal education were practising sole cropping (Table 5.39 below). A greater proportion of those who attended school practising sole cropping is expected because its adoption in the developing world is seen as a symbol of development of farming. The difference was, however, not statistically significant ($\chi^2 = 0.6, p>0.05$). It means that the cropping system practised by the contact farmers does not depend on the educational level. There was no difference because both the contact farmer respondents (those who had been to school and those who did not) need to ensure against total loss due to unfavourable whether conditions (Komalafe et al, 1981).

Table 5 39: Distribution of contact farmers according to their education by cropping system practised.

Cropping system	Educational level			
	No formal education		Formal education	
	Frequency	Percentage	Frequency	Percentage
Multiple cropping	27	77	10	67
Sole cropping	8	23	5	33
Total	35	100	15	100

$$\chi^2 = 0.6 \quad df = 1 \quad p=0.43 \quad (NS)$$

5.4.7. Relevance of information and cropping systems.

Relevance of information was cross tabulated with the cropping systems (multiple and sole cropping) with the objective of finding out which cropping system the information was more relevant to. The results are tabulated in Table 5.40 below. The table indicates the frequency of responses and their percentages.

Table 5 40: Distribution of contact farmers according to cropping systems they practice by relevance of information.

Relevance of information	Cropping systems			
	Multiple cropping		Sole cropping	
	Frequency	Percentage	Frequency	Percentage
Not relevant	20	54	2	15
Relevant	17	46	11	85
Total	37	100	13	100

$$\chi^2 = 5.8 \quad df = 1 \quad p=0.015 \quad (S)$$

It was discovered that a greater percentage of multiple croppers said the information was not relevant (54%) than those who were practising sole cropping (15%). More of those who were sole croppers (85%) also found the information relevant than those who were practising multiple cropping (46%). Therefore, the information received was

found more relevant to the sole croppers than the multiple croppers. The difference between the two cropping systems with reference to relevance of information under the T & V system was found statistically significant ($\chi^2 = 5.8, p < 0.05$). This implies that the relevance of an extension message to the contact farmer is dependent on the cropping system practised. The difference in relevance of the extension messages could be from the complexity of multiple cropping systems, which require varied information needs and different environmental conditions. Gentile (1988), noted that unlike in Asia where technical information are suitable to the crops and allow uniform planting dates and control of agricultural practices, it is not so in the Sahel and elsewhere. Farmers in these countries have complex cropping systems and highly varied ecological conditions. Adams (1990), also noted that the system which emphasises the package deal approach and the mechanical organisation of a large number of village-level staff who are told what to do every fortnight, is suitable only for homogenous conditions and narrow range of crops. The result is that, information that will be relevant to sole croppers with uniform dates of agricultural practices will not be relevant to multiple croppers.

5.5 Part Five: Adequacy of information delivered and cropping systems.

This section sought to find out whether the information delivered by AEs was adequate to farmers practising the various cropping systems. It is organised under the AEs source of information, information received and implemented by farmers and limitations to the delivery of extension messages.

5.5.1. Agricultural extension agents' sources of information.

When the extension agents were asked to list their main sources of information they deliver to the contact farmers, 13% of them stated they obtain their information from reading materials. Thirty-three percent said they use their personal knowledge and majority, 87% obtain information from their superior officer (see Table 5.41)

Table 5.41: Distribution of extension agents by source of information.

	Response	Freq	Percent
Source of information	Reading materials	2	13
	personal knowledge	5	33
	Superior officers & SMS	13	87
Who decides on what information to deliver to farmers	Subject matter specialists	13	87
	District development officers	2	13

Source: The survey study.

This implies that most of the information delivered to the contact farmers is obtained from the superior officers. With regards to who made the decision on what information to deliver to farmers, majority of the extension agents (87%) reported that it was the Subject Matter Specialists (SMSs) who decided on what information to give to the farmers whilst 13% said it was the District Development Officers (DDOs). Thus, the information sent to the farmers was from top-down.

5.5.2. Consideration of farmers socio-economic situation in extension delivery.

The system of farming practices in any area is influenced by many factors. Such factors include environmental factors, biological factors and socio-economic factors. For the AEA to effectively bring about change he must be knowledgeable about these factors. He should consider them in the delivery of his information. When the AEAs were asked about the factors they consider in the delivery of their information the following factors tabulated in Table 5.42 below were stated.

Table 5.42: Distribution of extension agents by factors considered in the delivery of extension message

Factors considered in the delivery of extension messages	Frequencies	Percentage
Farmers resources	12	80
Farmers beliefs	5	33
Climatic conditions	8	53
Taboos of the people	7	47
Traditional rules & regulations	1	7

Source: *The survey study.*

There were multiple responses

From the table it can be noted that 80% of the AEAs interviewed considered the farmers' resources, and only 7% considered the traditional rules and regulations of the target group. Fifty three percent considered the climatic conditions. Thus, the factors they considered in the delivery of their extension information were the farmers' resources and climate. Consideration of the farmers' resources may influence their selection of the contact farmers - selecting the rich of the community.

5.5.3 The Extension Workers Perception on Effectiveness of T & V

The extension agents were asked how they consider the T & V extension system in the delivery of extension messages. Eighty percent (80%) of the extension agents said that the system was effective while 13% said it was very effective. That is, with reference to the opinion of the extension agents the T & V extension system was effective in the delivery of extension messages. This is in line with the contact farmers' view that the Training and Visit system is effective. It is also supported by Albrecht et al. (1989) who wrote that many elements from Training and visit catalogue of recommendations can be applied successfully provided they have been checked for suitability and tried out under the prevailing conditions.

Table 5.43: Distribution of extension agents by their perception of effectiveness of extension delivery.

Perception of effectiveness of extension delivery.	Frequency	Percentage
Very effective	2	13
Effective	12	80
Not effective	1	7
Total	15	100

Source: The survey study.

5.5.4. Information received and implemented

a. Crops on which information was received:

In determining the crops on which information was received, it was found that maize (82%), sorghum (68%), and cowpea (72%) were the major crops on which information was commonly provided to contact farmers. For noncontact farmers only 22% said

they received information from the contact farmers (see Figure 5.10). Those who received information from the contact farmers mentioned maize (90%), cowpea (90%) and sorghum (72%) as the crops on which they received information. Figure 5.10 below indicates the crops and the frequency of responses. This indicates that maize, Sorghum, Cowpea, and Groundnuts are the crops Extension Agents base their information on. It has been noted, in the World Bank staff appraisal report (1992), that the main focus of the T & V has been on maize, sorghum, groundnuts, millet, and cowpea. This may be why the respondents received low information on the other crops. The contact farmers also reported that they receive information only on crops they cultivate.

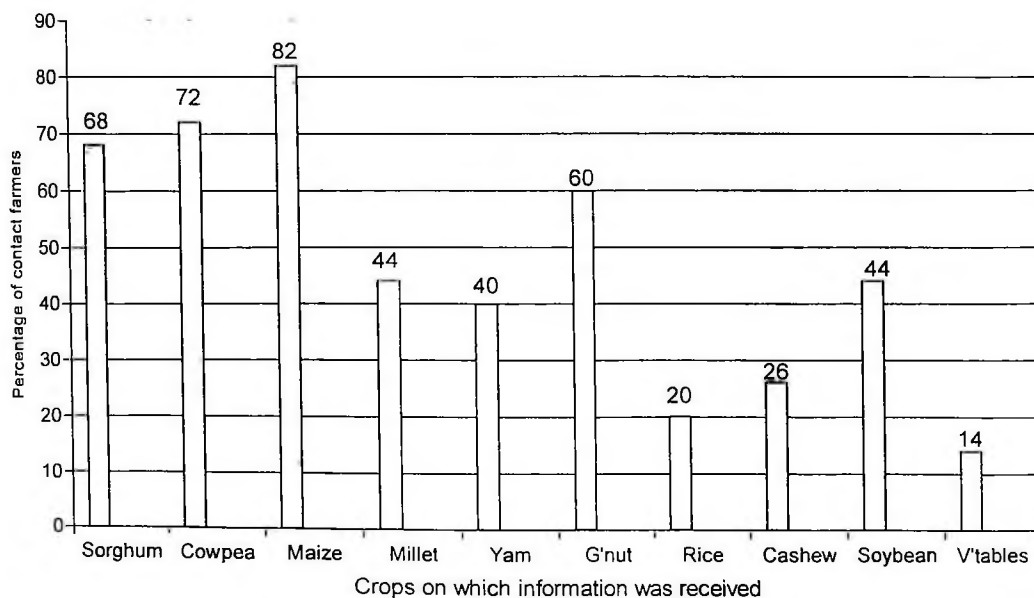


Figure 5.7: Percentage distribution of contact farmers by crops on which information was received

b. Animals on which information was received:

It was noted that goats, sheep, poultry and cattle were the animals on which much information was received. The responses are tabulated in table 5.44. From the table it can be noted that there was inadequate information on livestock to the contact farmers. This is indicated by the very low responses. Except information on goats, less than 40% of the contact farmers received information on the animals they rear. It was also noted, during the survey, that fowls and goats were being promoted in the district by International Fund for Agricultural Development (IFAD). The goats were imported from Burkina Faso and were to be given to selected contact farmers for cross breeding. This might have accounted for the high percentage of goats and fowls.

Table 5.44: Animals on which information was received

ANIMALS	FREQUENCY	PERCENTAGE
Goats	25	50
Fowls	19	38
Sheep	17	34
Cattle	14	28
Guinea fowls	9	18
Pigs	6	12
Ducks	4	8
Turkeys	3	6
Rabbits	3	6
Fish	2	4

*There were multiple responses

Table 5.45 indicates the various categories of information delivered to contact farmers (obtained from MOFA). It shows the frequencies and percentages of the information

received and that of the information implemented. Analysis was based on the frequencies of responses.

From the table it can be seen that the most popular information sent to farmers in the area of crops were row planting, fertiliser application, the use of tractor to plough, timely weeding and information on improved varieties of crops. Thus, most of the information provided to majority of the contact farmers was based on arable crop cultivation (52-100%). Information on animal production is moderate as compared to arable crops (54-68%) while fish production is the least information delivered (36-40%)

The most common information that was implemented by majority of the respondents were information on storage (76%), timely weeding and planting (86%), information on the various crop varieties (maize, cowpea, rice etc) (74%), and the use of tractor for ploughing which has been a practice before the inception of the T & V. The results of these findings agreed with the principle of the T & V that simple recommendations that farmers can afford are made to the farmers (Adams, 1990). These simple recommendations are planting in rows(98%), timely weeding (86%),storage (76) and improved varieties (74%).

Table 5.45: Distribution of contact farmers by Information received and information implemented.

Information received and implemented	RECEIVED		IMPLEMENTED	
	Freq.	Percent	Freq.	Percent
Row planting	50	100	49	98
timely weeding	47	54	43	86
storage	44	88	38	76
Tractor cultivation	48	96	37	74
improved crop varieties	46	52	37	74
Soy utilisation	41	82	31	67
Fertiliser application	49	98	26	52
Tree crop cultivation	37	74	24	48
Pesticide application	37	74	21	42
Soil and water conservation	27	52	21	42
Agro-forestry	26	48	18	36
Animal traction	42	84	7	14
Human nutrition	33	66	27	54
Animal health	34	68	25	50
Food preservation	27	54	25	50
Home management	28	56	23	46
Animal feed	31	62	19	38
Animal housing	34	68	18	36
Animal management	28	56	16	32
Improved animal breeds	34	68	13	26
Processing of fish	24	40	12	24
Fish pond construction	20	38	3	6
Rearing fish	19	36	0	0
Harvesting fish	18	36	1	2

5.5.5. Limitations to the delivery of extension messages

For efficient and effective transfer of information the AEAs must be facilitated to carry out their work. The following limitations were mentioned as constraints to their effective delivery of information

1. Inadequate logistics, such as travelling expenditure.
2. Unavailability of inputs to go with information
3. Unfulfilled promises made to farmers by previous authorities
4. Excessive work load
5. Farmers involvement in funerals and other customary practices.

Inadequate logistics has been identified by Moris (1991) as one of the causes of AEA's low moral. This often occurs when senior officers try to safe-guard payment of salaries as department revenue shrink. A more serious stage he stated is that of the inability to keep staff mobile. Such constraints have severe impacts on extension delivery.

Excessive workload was bound to occur since work that was done by several organisations are to be handled by one agent, as a result of the merger of the various departments into one. This coupled with scattered clientele living in remote areas and cultivating multiple crops in diverse ecological zones, make extension work tedious.

Unavailability of inputs to match with information is a basic setback to proving the benefits of the information to the learner. Some inputs are needed to facilitate demonstrations. Farmers involvement in funeral and other customary practices has also been identified by Bradfield (1966) as a social barrier to extension delivery.

5.5.6. Limitations to the implementation of information

The contact farmers were asked to state whether there were any problems that hinder the ability to make use of the information that was passed on to them by the AEAs. Seventy-six percent (76%) of the contact farmers stated there were problems that limit the utilisation of the information received. Seventy three percent (73%) of the noncontact farmers that received information also agreed they face problems. To find out what these problems were, an open question was asked to provide the respondents opportunity to mention their problems without influence of the prompts that would have been provided. The limitations mentioned by both the contact and noncontact farmers are tabulated in table 5.46.

Table 5.46 Distribution of contact and noncontact farmer respondents by limitations to the implementation of information

Limitations to implementation of information	Contact Farmer		Noncontact Farmer	
	Freq.	Percent	Freq.	Percent
Erratic rainfall	50	100	11	100
Lack of credit	35	92	4	36
Lack/cost of input	14	37	-	
Lack of labour	7	18	2	18
Lack of adequate knowledge	3	8	-	
Sickness	2	5		
Difficulty to meet	-	-	2	18

There were multiple responses

Source: the survey study

The findings tabulated were supported by the work done by de Boer, (1996) in Busa which is within Wa District. Climatic conditions, high cost of farm inputs, lack of

capital/loans, and lack of labour were the major problems found to be the cause of low food production in the area.

Credit was seen to be the most single factor limiting the implementation of information received. The respondents noted that with money they could hire a tractor to plough and purchase the other inputs. The inputs were either not available or too costly. As one of the respondents put it "those days the fertiliser was affordable and we could buy but now it is impossible for me to buy" This is supported by the assertion of the AEAs that lack of inputs is one of the difficulties they encounter in the delivery of information.

Information must be followed with the inputs that will facilitate the use of the information. Roberts (1989) also noted that T & V cannot increase production unless the complementary parts, inputs supply and credit, market mechanisms and price incentives, are in place. This is, however, not the case in the District. Migration has been identified by de Boer (1996) to be the cause of lack of labour in the district.

Climatic factors such as drought was universally accepted as a problem. It was also asserted that there was nothing they could do about that. Erratic rainfall reduce the harmonious way of sending information to the farmers since the information needs will be influenced by weather.

5.5.7. Farmers' sources of information

To assess the various sources of information, the respondents were asked to rank their various sources of information. A four point scale was used:- first important

source, second, third and fourth important source. First important being the most important. Their responses are tabulated in table 5.47.

Table 5.47: Distribution of contact farmers by their sources of information

Source of information	Ranking of sources of information by level of importance							
	First source		Second source		Third source		Forth source	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Extension agent	24	48	18	36	7	14		-
Farmers/Neighbour	23	46	17	34	7	14		-
Radio programmes	3	6	4	8	8	16	4	8
Salesmen/agencies	-	-	9	18	20	40	10	20
Demo/Field days	-	-	-		2	4	2	4
Journals & books		-	1	2	-		-	

Source: *The survey study*

There were multiple responses

From the table it can be noted that the first important source of farm information to the contact farmers was the AEA as indicated by the high percentage of responses (48%). Their second most important source of information was their fellow farmers (46%) and the third was salesmen and agencies. Journals and books were the least source of information because majority of the respondents did not go to school and could not read. These findings agreed with the work of Feder and Slade (1986) in India. They found that contact farmers consider extension to be their primary source of information and that farmers also obtain a lot of information from each other. Blackburn, (1989), noted that the higher the level of education the greater the tendency to identify journals and books as a source of information. From the study the educational level of the people was low and therefore journals and books as their source of information was also low.

Table 5.48: Sources of noncontact farmers' information

Source of information	Ranking of source of information by level of importance							
	First source		Second source		Third source		Forth source	
	Freq	%	Freq	%	Freq	%	Freq	%
Extension agent	9	18	5	10			3	6
Other farmers/neighbours	23	46	8	16	6	12	2	4
Radio programmes	12	24	7	14	3	6		-
Salesmen & Agencies	3	6	9	18	2	4	2	4
Demo/Field days	2	4	2	4	4	8	2	4
Journals & books	1	2	4	8	1	2	4	8

Source: *The survey study.*

. There were multiple responses

The pattern of source of information differs from that of the contact farmers. From Table 5.48 the first source of information of the contact farmers was other farmers and neighbours (46%), The second source of information was Salesmen and agencies (18%). Feder and Slade (1986), also observed in their study in Kairana, India, that the most important source of information to noncontact farmers was other farmers.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.0. Introduction

This chapter provides summary of the study, findings, implication of the study, conclusion, and recommendations.

6.1. Research procedure

To increase food production to cope with the increasing population and to achieve agricultural development, through promoting the use of improved technologies, the Training and Visit extension system was introduced in the two Upper Regions of Ghana in 1978 as a model. The system was eventually implemented throughout the country in 1993. In spite of the introduction of this system in Wa District for more than fifteen years, per capita food availability is rather decreasing. This is contrary to India's case where the introduction of the system led to 56% increase in food availability within three years.

Decrease in food availability could result from many factors. These include cost and lack of inputs, unfavourable weather conditions including erratic rainfall and decreasing soil fertility. It could also be that the information delivered to farmers by the Agricultural Extension Agents is not relevant to their cropping system. As such, they do not use the

information. The study was conducted to determine the relevance of the extension messages delivered in the Training and Visit extension system practised in Wa District of the Upper West Region of Ghana.

The convergence model of communication was used in the study to determine the relevance of the messages. The model was used because it was seen as most successful in the transfer of technology.

The sample size consisted of 100 contact and noncontact farmers, who are living and farming in the Wa district of the Upper West Region. Fifteen extension agents were also interviewed. Random sampling was used to select the contact farmers and purposive sampling for the noncontact farmers. Interview schedules were used to collect information from both the contact and noncontact farmers. A questionnaire was administered to the AEAs.

The data obtained were analysed using frequencies and percentages. The chi-square was used to determine the significant differences or relationships between the variables.

6.2. Findings of the study.

The findings of the study are presented under the subheadings demographic background information of the respondents, relevance of information, relevance of

information to the contact farmer respondents, and relevance of information and social characteristics of the respondents. Others are cropping systems, relevance of information and cropping systems, and important sources of information.

6.2.1. Demographic background information of the respondents.

It was found that the mean age of the respondents was forty-five years. Majority of them were aged forty years. Most of them (92%) were also married, 4% widowed and 4% single. The level of education of the respondents was found to be very low.

6.2.2 Relevance of information

The findings of the relevance of information are presented under the following subheadings – Involvement in need identification, ii. Farmer extension agent relationship, iii. Presentation of information, iv. Interest in information, and v. Timing of information.

6.2.2.1. Involvement in needs identification

It was found that:

- Majority of the respondents (74%) were not involved in their need identification.
- Sixty-two percent said the information was sometimes able to solve their farming problems
- Seventy percent of the AEAs said they sometimes involve the contact farmers.

6.2.2.2. Farmer extension agent relationship

It was found from the study that

- Ninety-four percent (94%) of the contact farmer respondents had cordial relationship with the AEA operating in their area.
- Sixty percent of the AEAs also said they had cordial relationship with their farmers.

6.2.2.3. Presentation of information

- It was found that majority of the respondents liked the way information was presented to them.
- Majority of the AEAs considered only the resource of the farmers when presenting information to them.

6.2.2.4. Interest in information

- It was found that, most of the respondents (70%) were always interested in the information.

6.2.2.5. Timing of information

- Majority (62%), of the contact farmer respondents said the information was timely.
- Sixty seven percent of the AEAs said it was timely.

6.2.3. Relevance of information to the contact farmer respondents

It was found that

- the information received was relevant to majority (66%) of the respondents.
- the information was also satisfactory to 42% and just satisfactory to 56%.
- the visits made by the extension agents were found useful by the contact farmers.
The method of teaching used was demonstration.
- the extension messages delivered to the respondents were more relevant to those who were involved in their need identification (85%) than those who were not involved (46%). There was a significant relationship between involvement in need identification and relevance of information ($\chi^2 = 5.6, p < 0.05$).
- majority of those who liked the way information was presented to them (57%), said the information was relevant. However, there was no significant relationship between mode of presentation and relevance of information ($\chi^2 = 1.29, p > 0.05$).
- majority of the contact farmer respondents had cordial relations with the extension agent. There was no significant relationship between relevance of information and relationship ($\chi^2 = 0.52, p > 0.05$).
- the information received was relevant to majority of those that found the information timely (68%) than those that found the information untimely (63%). The relationship between timing of information and its relevance to the respondent was statistically significant ($\chi^2 = 4.03, p < 0.05$).
- More of those who were sometimes interested in the information (73%) found the information relevant than those who said they were always interested (49%). There

was no significant relationship between interest in information and its relevance to the respondent ($\chi^2 = 2.6$, $p > 0.5$).

6.2.4. Relevance of information and social characteristics of the respondents

From the study it was found that

- Equal number of those below average age (47.5) and those above average age found the information relevant.
- The information was more relevant to majority of the females (75%) than males (52%) The difference was not significant.
- Proportionately more married respondents (59%) found the information relevant than those who were single (25%).
- No significant difference was found between the social characteristics of the respondents in relations to relevance of the information.

6.2.5.. Noncontact farmers contact with Extension messages

Majority (84%) of the noncontact farmers knew the extension agent. Seventy-four percent knew the kind of work he does. Majority (52%) knew the contact farmers in their areas. Only 22% received information from the contact farmers in their area. Majority (90%) of those who received the information, received it during farmers' meetings. All those (22%) who received information from the contact farmers found the information useful and relevant to their situation. Information does not flow from the contact farmers to noncontact farmers.

6.2.6. Cropping systems

From the study it was found that

- Two main cropping systems were practised, these are the multiple cropping and sole cropping systems. More noncontact farmer respondents were practising multiple cropping than contact farmer respondents. Sole cropping was practised more by contact farmer respondents than noncontact farmer respondents.
- Though different varieties of crops were planted in one season, the major crops grown by the respondents were cowpea (87%), sorghum (86%), maize (86%), groundnut (80%), millet (79%) and Yam (36%).
- The most important crop mixture planted as multiple crop was cowpea and sorghum 70%. Groundnut was also the major crop planted as sole crop.
- It was found that the most important crops on which information was provided by the extension agents to contact farmers was on cowpea (72%), and maize (82%).
- The major livestock owned by the people were fowls (71%), goats (57%), cattle (45%) and guinea fowls (45%). More contact farmers (96%) owned livestock than noncontact farmers (76%). Eighty-six percent of the total sample owned livestock.

6.2.6.1. Cropping system and social characteristics.

It was found that,

- A greater percentage (76%), of the respondents below the average age were practising multiple cropping than those above the average age (72%).

- More of those above the average age were practising sole cropping than those below the average. However, the difference was not significant ($\chi^2 = 0.1$, $p > 0.05$).
- More females (75%), were found practising sole cropping than males (17%). The difference was statistically significant ($\chi^2 = 11.9$, $p < 0.05$).
- There was no significant difference between marital status (married and single) in relations to the cropping systems ($\chi^2 = 0.4$, $p > 0.05$).
- More of those who had no formal education were practising multiple cropping than those who had formal education. Those who had formal education were also practising sole cropping than those who had no formal education ($\chi^2 = 0.6$, $p > 0.05$).

6.2.6.2. Relevance of information and cropping systems.

It was found that:

- Most of the sole croppers (85%) found the information relevant than multiple croppers (46%).
- There was a significant relationship between relevance of information and the cropping system practised by farmers ($\chi^2 = 5.8$, $p < 0.05$).
- Those respondents who were practising sole cropping were able to use the information better than those who were practising multiple cropping. The differences was significant ($\chi^2 = 6.25$, $p < 0.05$).

6.2.7. Information delivery and implementation

It was found that:

- Most of the information provided to majority of the contact farmers was based on arable crop cultivation (74-100%). Information on animal production was moderate as compared with arable crops (62-68%) while fish production was the least of information delivered (36-38%)
- The most common information implemented by majority of the respondents was information on storage (76%), timely weeding, row planting (86%), information on the various crop varieties (maize, cowpea, rice etc.) (74%), and the use of tractors for ploughing
- The information commonly sent to farmers was on row spacing, storage, improved crop varieties, timely weeding, use of tractor and fertiliser application. The information they could use was row planting, tractor cultivation, timely weeding, improved crop varieties and storage as well as soy utilisation.

6.2.7.1. Limitations to the delivery of extension

The factors that limited the deliveries of extension messages were found to be:

- i. In-adequate logistics to extension agents.
- ii. Unavailability of inputs to go with the information carried by the agents
- iii. Unfulfilled promises made to farmers by previous authorities
- iv. Excessive work load to extension agents

- v. Farmers' involvement in socio-cultural activities, and
- vi. Difficulty to bring farmers together for a meeting.

6.2.7.2. Limitations to the utilisation of information

Limitations to the implementation of information were

1. erratic rainfall,
2. lack of credit,
3. lack or high cost of inputs,
4. lack of labour,
5. lack of adequate knowledge to use the information and
6. difficulty to meet as a group

6.2.8. Important sources of information for contact and noncontact farmers.

- For contact farmers their most important source of information was the AEA, other farmers being their second source of information and salesmen/Agency as their third important source of information.
- For noncontact farmers their most important source of information was their fellow farmers, radio as second important source and sales agents and agencies as their third source important source of information.
- In the opinion of the AEAs, the information they send was timely, they had good relations with their farmers. They considered the farmers resources and climatic conditions when delivering information. Training and Visit extension system, in their opinion, is effective.

6.3. Summary

- The farming population in the District is an aging one. Majority of the farmers had no formal education.
- Females and the youth were not involved in extension activities
- The farmers were not involved in their needs identification and information was top-down
- They had good relation with the AEA's. The information was timely, the farmers liked the way information was presented to them and it was satisfactory to them.
- The information delivered to farmers was more relevant to sole croppers than mixed croppers. There was a significant difference in relevance of information to farmers practising the various cropping systems,
- They found the information to meet their needs.
- The availability of inputs, credit and rainfall were the basic hindrances to the utilisation of the information.
- Information does not flow from the contact farmers to the noncontact farmers.
- There was very low contact between the extension agents and noncontact farmers.
- The main source of information to the contact farmers was the extension agent and that of the noncontact farmers, other farmers and neighbours.

6.4. Implications of the findings

Relating the findings to the conceptual framework:

All the factors that will make the information relevant and effective in the transfer of technology were available in the T & V extension system except that the farmers were not involved in the information need assessment. Thus, making the information relevant to 56% of the respondents and not relevant to a significant proportion (44%) of the contact farmers.

The information was relevant to majority of the contact farmers. Those who found the information relevant had the desire to use the information. Though they had the desire to use the information, its utilisation was hindered by lack of inputs

The resultant output was also found to be influenced by unfavourable climatic conditions, which influenced their satisfaction. The level of satisfaction influences the adoption of the information/technology. The result was majority of the respondents using below average of the information received although it was relevant to them.

6.5. Conclusion

It is therefore, concluded that the extension messages delivered under the cropping systems of the Wa District were relevant to majority of the contact farmers. The extension messages were also found to be more relevant to sole croppers than the multiple croppers and the difference was significant.

Other factors that were not the focus of the study were found to influence the use of extension messages. These factors included lack of credit, unavailability and cost of inputs, labour, lack of adequate knowledge, and erratic rainfall. With these are the constraints that affect the AEAs, performance in the delivery of their information.

6.6. Recommendations

Even though it was found that all the factors that will make the information relevant was present in the T & V, a significant proportion of the contact farmers did not find the information relevant. Therefore, since the objective of extension is to make the information relevant to all farmers, farmers must necessarily be involved in the process of need diagnosis. When the needs are collaboratively identified specific interventions should be developed to meet the needs and not general interventions from the heard quarters.

From the study the extension messages were found to be more relevant to sole croppers than mixed croppers who are the majority. It is therefore, recommended that (i) more research work is done to make the information relevant to the mixed croppers who are the majority, or (ii) one major crop in an area could be focused on with some attention to other crops. This may make the delivery of information closer to that of sole cropping.

Information on animal production needs to be properly integrated with arable crop production since most of the farmers raise livestock as well.

Information could probably "trickle down" better if the selection of contact farmers is left to the farmers themselves. The role of the AEA should be to aid in the process of selection. This may let the farmers see the contact farmers as their representative and not some one imposed by extension agents. The contact farmer may also have some commitment to the others. Thus, allowing the flow of information from the contact farmer to the noncontact farmers.

There is the need of formal linkages of the Training and Visit system with input suppliers. The Farmers Services Company could be supported to provide inputs at reduced prices to the farmers. Inputs could also be provided on credit and beneficiaries pay back by instalments. In this case the personnel of FASCOM should be solely responsible for the credit recovery. From the researchers experience, provision of credit in the form of cash is often diverted to other activities or nonfarmers tend to obtain such a facility, which does not go into farming.

6.7. Suggestion for Further Studies

Making extension messages relevant to farmers is only one factor among several others that contribute to the success of the Training and Visit extension system, and therefore, agricultural production. It is therefore, suggested that further studies be conducted to determine the effect and/or level of influence of input availability/supply on the utilisation of extension messages and to find ways of making it better accessible to farmers.

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APPENDIX : A

TABLE I: 1996 PROGRAMME REVIEW - WA DISTRICT

INTERVENTION /ACTIVITY/ SMS RECOMMENDATION	TARGET	ACHIEVEMENT	PROBLEMS ENCOUNTER	SUGGESTED SOLUTIONS / MODIFICATIONS	RESPONSIBLE AGENCY
Encourage ridging with bullocks along slope	28	20	-insufficient training for AEAs -Cattle rustling	-Need to train tractor operators on appropriate ploughing techniques	AESD, farmers, AEAS.
Bonding in rice fields	28	0	No training for AEAs	AEAs to be trained	AESD, CSD
Encourage the use of improved varieties - - maize - groundnut - cowpea - soybean - sorghum - cassava	140 56 112 84 28 112	77 27 86 60 6 0	- high cost of improved varieties - High cost of accompanying inputs	Encourage more local seed growers	PPRS, AEAs, CSD.
Encourage the production of micro-livestock eg. rabbits, guinea pigs etc.	28	28	Breeding stock not readily available	Explore avenues for breeding stock	APD, WIAD, AEAs
Intensify dry season gardening	28	101	-Rotation not practiced -improved seeds not available	Farmers to rotate the various crops	

Source: Dept of Agric. Ext. Upper West Region. 1997 programme of work

APPENDIX : B

TABLE II: 1997 PROGRAMME OF WORK, WA DISTRICT

Present situation	Extension objective	Main activity	Time frame	Strategy	Responsibility	Production target	Constraint
Low response by farmers to the use of Animal traction	Response to animal traction increased	Step up education on animal traction -train AEAs and Farmers on animal traction	Jan - Dec.	-On-farm demonstration -institute awards for best traction farmers	DAEO, AESD, AEAs, farmers and Dist. Ass. NGOs	30 farmers	
Low knowledge in bonding techniques	AEAs Trained in bonding techniques	Train AEAs on bonding techniques	Jan - Dec.	On field training	AESD, AEAs	15 farmers	
Low use of improved seed varieties	Use of improved varieties increased	-Intensify education advantage on the use of improved seeds: groundnut, maize, cowpea, soybean, cassava, sorghum -Organic farmers into groups for credit -Ensure availability and accessibility to seed sources	April - July	minidemo	farmers, AEAs CSC	CROP NO maize 100 G'nuts 56 cowpea 120 S'bean 90 Sorghum 15 cassava 30	
Low use of (OM) organic manure	Use of OM increased	-Intensify education on the use of OM -Encourage housing of livestock	Jan - Dec.	Demonstration and minidemos	DAES, Farmers	100 farmers	

SOURCE: DEPT OF AGRIC. EXT. UPPER WEST REGION. 1997 PROGRAMME OF WORK

EVENT/ACTIVITY/MOMERABLE OCCASION	DATE
Death of Wa-Naah Seidu Wala	14 th March 1961
Installation of Wa-Naah Sisique Bomi	27 th May 1961
First attempt at assassinating Nkrumah(Kulungungu bomb)	1962
Second attempt at assassinating Nkrumah (Flagstaff House Accra)	1964
National referendum on one party state	1964
First Coup d'etat	24 th Feb.1966
Counter coup (Kotoka killed)	April, 1967
Second Republic- K. A. Busia as prime minister(PP)	1 st Oct. 1969
Second Coup de'etat (Busia's Government overthrown.	3 th Jan. 1972
Death of Nkrumah in exile	27 th April,1972
Death of Wa Naah Sidique Bomi	21 st Nov. 1978
Installation of Wa-Naah Momory Bundiri II	18 th Jan. 1979
Upper Region sub-divided into Upper East and Upper West Regions	1983
Death of Dorimon-Naah Abudu Mumuni	1988
Death of Wa-Naah Momory Buniri II	16 th Jan. 1998

Source: *Courtesy of Attengdem P. B. (1997), and Wa Traditional Council.(1998)*

Section B: Adequacy of Information**i. Farmers participation in needs identification**

5. Do you discuss with the extension agent what your farming problems are before he brings information to you? a. Yes [] b. No []

6. If you do not discuss your farming problems with the extension agent before he brings you information how often does the information he brings you able to solve your farming problems?

a. Always [] b. Sometimes [] c. Never []

7. Do you discuss other problems outside farming with your extension agents?

a. Always [] b. Sometimes [] c. Never []

ii. Farmer - extension agent relationship

8. How will you describe the relationship between you and the Extension agent?

a. Not cordial [] b. Cordial [] c. Very cordial []

9. Will you like the Extension Agent to be changed?

a. Yes [] b. No []

10. Do you like being visited by the Extension agent?

a. Yes [] b. No []

11. If no, please explain... ..

12. How would you describe his visits (you may tick more than one).

a. Relaxed and takes his time [] c. Not useful [] b. Always in a hurry []
d. Useful []

13. How much do you have opportunity to express yourself at such meetings?

a. Very much [] b. Moderate [] c. Not much []

iii. Farmers interest in information

14. Are you interested in the information he brings to you?

- a. Always [] b. Sometimes [] c. Never []

15. If no, what are your reasons.....

iv. Presentation of information.

16. Where does the extension agent always meet you?

- a. At home [] b. On farm [] c. Both farm and home []

17. Does he meet you?

- a. Individually [] b. In a group [] c. Individually and group
[]

18. Which of the following ways does the Extension agent use in passing information to you? (Tick where applicable)

- a. By demonstration [] b. Talking only []
c. Use visual aids [] d. Use visual aids and talking [].

19. Do you like the way he passes on information to you? a. Yes [] b. No []

20. If yes, how satisfactory do you find his information?

- a. Very satisfactory [] b. Satisfactory [] c. Not satisfactory []

v. Timing of information

21. Are messages on specific farm operations (such as planting insect control, etc.) received

- a. Before the time you need it []
b. At the time you actually need it []
c. After the time you needed it []

Section C: Effectiveness of Messages & Farming Systems

22. What type of farming system do you practice on your farm?

- a. Mixed cropping (growing more than one crop on the same land without row spacing) - []
- b. Sole cropping (only one crop planted on the land) []
- c. Agro-forestry (food crop and tree crop) - - - - - []
- d. Mixed farming (raising both crops and animals) []
- e. Inter cropping (growing more than one crop in rows) []
- f. Others (specify)-----

23. Tick all the crops you grow in one season.

- a. maize [] e. cowpea [] i. soy beans []
- b. sorghum [] f. rice [] j. vegetables []
- c. millet [] g. Cotton [] k. Groundnuts []
- d. yam [] h. Cashew [] l. others specify-----

24. Give the various crop mixtures you plant as mixed crops. Indicate farm size

Crop	Area
1-----	-----
2-----	-----
3-----	-----

25. List the crops you grow together as intercrops. Indicate farm size

Crop	Area
1-----	-----
2-----	-----
3-----	-----

26. Which of these crops do you plant as sole crops?

- a. Maize [] e. Cowpea [] i. Soy beans []
- b. Sorghum [] f. Rice [] j. Vegetables []
- c. Millet [] g. Cotton [] k. Groundnuts []
- d. Yam [] h. Cashew [] k. Others specify-----

27. On which crops do you receive information?

- a. Maize [] e. Cowpea [] i. Soy beans []
- b. Sorghum [] f. Rice [] j. Vegetables []
- c. Millet [] g. Cotton [] k. Groundnuts []
- d. Yam [] h. Cashew [] k. Others specify-----

28. To what extent does the information able to address the problems you face in growing the crops a. Limited extent [] b. Moderate extent [] c. Large extent []

29. Which of these animals do you rear?

- a. Cattle [] d. Pig [] g. Fish -- []
 b. Sheep [] e. Rabbits [] h. Guinea fowls []
 c. Goats [] f. Turkey [] i. Ducks --- []
 j. Fowls [] k. Others (specify)-----

30. Which of the animals have you received information on?

- a. Cattle [] d. Pig [] g. Fish []
 b. Sheep [] e. Rabbits [] h. Guinea fowls []
 c. Goats [] f. Turkey [] i. ducks []
 j. Fowls [] k. Others (specify)-----

31. Is the information able to address the problems you face in raising the animals? a. Yes [] b. No []

32. How satisfactory do you consider the way he works with you?

- a.. Very satisfactory [] b. Just satisfactory [] c. Not satisfactory []

33. If no, what improvement will you suggest?

- a. -----
 b. -----

34. Do you always share the information with other farmers?

- a yes [] b. No []

35. If no, why -----

36. Does the extension agent ever have cause to give specific information to other members of your family? a. Yes [] b. No []

37 Indicate (tick) in the space provided which of the information listed below you have

(i) received (ii) implemented

INFORMATION	RECEIVED	IMPLEMENTED
Improved varieties		
Animal drawn cultivation		
Tractor cultivation		
Row planting		
Organic manure application		
Fertilizer application		
Timely weeding		
Pesticide application		
Harvesting		
Agro-Forestry		
Storage		
Tree crop(cashew, mango, etc.		
Soil & water conservation		
Home management		
Human nutrition		
Soy utilization		
Food preservation		
Improved animal breeds		
Feed		
Management		
Housing		
Animal health		
Pond construction		
Rearing fish		
Harvesting fish		
Processing of fish		
others (specify		

Section D: Problems Faced in Information Utilization

38. Do you encounter any problems in making use of the information the agent discusses with you? a. Yes [] b. No []

39. If yes, to question 38 what are these problems?

.....
.....

40. Which of the following is your most important source of information?(indicate the order of importance)

- a. Advice from extension agents []
- b. advice from other farmers []
- c. Agricultural radio programs []
- d. Salesmen & agency personnel []
- e. Journals & books []
- f. Demonstration/field days []
- g. Others

specify.....

41. What is your judgment about the information you receive?

- a. Not relevant []
- b. Just relevant []
- c. Very relevant []

Section B: Contact with Extension Messages

5. Do you know the extension agent that visit your area?
a. Yes [] B. No []
6. If yes, do you know the farmers he visits?
a. Yes [] b. No []
7. What does the extension agent visit the farmer to do?
a. I do not know []
b. Usual social visit []
c. To discuss issues related to farming []
d. Others (specify)-----
8. Do you often receive information from the farmers the extension agent visits?
a. Yes [] b. No []
9. If yes, in what way do you receive the information? (You may tick more than one.)
a. I go to him [] c. During farmers meetings []
b. He comes to me [] d. during market days []
e. Others (specify)-----
10. What sort of information do you receive? -----

11. Do you find the information you receive from the farmer useful?
a. Not useful [] b. Sometimes useful [] Always useful []
12. Do you share the information with other farmers?
a. Yes [] b. No []
13. If no, what are your reasons-----

14. If yes, does the other farmers express interest in the information?
a. No [] b. Sometimes [] c. Always []

15. Do you encounter any problems in making use of the information you receive?
 a. Yes [] b. No []
16. If yes, what are some of these problems?-----

17. If no, what do you suggest should be done to make it easier to use?

18. What is your judgment about the information you receive?
 a. Not relevant [] b. Just relevant [] c. Very relevant []
19. Has the extension agents ever visited you? a. Yes [] b. No []
20. If yes, how many times?
 a. Only once [] b. Twice [] c. Three times []
 d. Four times [] e. Several times []
21. What are the sources of your farm information? (indicate in order of importance
 a. Advice from the extension agent [] b. Advice from other farmers []
 c. Advice from contact farmers [] d. Demonstration/field days []
 e. Radio programs [] f. Salesmen & Agencies []
 g. Journals & books [] h. Others specify-----

Section C: Effectiveness of Messages & Farming Systems

22. Which of these farming systems best describes your type of farming (Tick only one option)
- a. Mixed cropping (growing more than one crop on the same land without row spacing) ---- []
- b. Sole cropping (only one crop planted on the land) []
- c. Agro-forestry (food crop and tree crops) ---- []
- d. Mixed farming (raising both crops and animals) .. []
- e. Inter cropping (growing more than one crop in rows) []
- f. Others (specify)-----

23. Tick all the crops you grow in one season.

a. Maize [] e. Cowpea [] i. Soy beans []

b. Sorghum [] f. Rice [] j. Vegetables []

c. Millet [] g. Cotton [] k. Groundnuts []

d. Yam [] h. Cashew []

i. Others specify-----

24. What are the various crop mixtures you plant as mixed crops. (Indicate farm size.)

	Crop mixture	Acreage
1	-----	-----
2	-----	-----
3	-----	-----
4	-----	-----

25. Which crops do you grow as intercrops? (Indicate the farm size.)

	Crops	Acreage
1	-----	-----
2	-----	-----
3	-----	-----

26. Which of these crops do you plant as sole crops? Indicate farm size

Crop	Acreage	Crop	Acreage
a. Maize		g. Cotton	
b. Sorghum		h. Cashew	
c. Millet		i. Soy beans	
d. Yam		j. Vegetables	
e. Cowpea		k. groundnuts	
f. Rice			
k. Others specify			

27. Which of these animals do you rear or keep?
- a. Cattle [] e. Rabbits[] h. Guinea fowls []
 b. Sheep [] f. Turkey [] i. Ducks []
 c. Goats [] g. Fish [] j. Fowls []
 d. Pig [] k Others (specify)-----
28. On which crops do you receive information
- a. Maize [] e. Cowpea [] i. Soy beans []
 b. Sorghum[] f. Rice [] j. Vegetables []
 c. Millet [] g. Cotton [] k. Groundnuts []
 d. Yam [] h Cashew []
 l. Others specify-----
29. To what extent does the information able to address the problems you face in growing the crops
- a. Limited extent [] b. Moderate extent [] c.Large extent []
30. Which of the animals have you received information on?
- a. Cattle [] e. Rabbits[] h. Guinea fowls []
 b. Sheep [] f. Turkey [] i. Ducks []
 c. Goats [] g. Fish [] j. Fowls []
 d. Pig [] k Others (specify)-----
31. Is the information able to address the problems you face in raising the animals? a. Yes [] b. No []

- 32 Tick in the space provided which of the information listed below
You have (i) **received** (ii) **implemented**.

INFORMATION	RECEIVED	IMPLEMENTED
Improved crop varieties(1=maize 2=cowpea, 3=sorghum, 4=rice, 5=soybeans,6=groundnuts, others .		
Animal drawn cultivation		
Tractor cultivation		
Row planting		
Organic manure application		
Fertilizer application		
Timely weeding		
Pesticide application		
Harvesting		
Agro-Forestry		
Storage		
Tree crop(cashew, mango, etc.		
Home management		
Human nutrition		
Soy utilization		
Food preservation		
Improved animal breeds		
Animal feed		
Management of animals		
Housing		
Animal health		
Pond construction		
Rearing fish		
Harvesting fish		
Processing of fish		
Others (specify)		

APPENDIX F:

**AGRICULTURAL EXTENSION DEPARTMENT
UNIVERSITY OF GHANA, LEGON****RELEVANCE OF THE TRAINING AND VISIT EXTENSION MESSAGES IN
THE MULTIPLE CROPPING SYSTEM OF FARMERS IN WA DISTRICT OF
THE UPPER WEST REGION, GHANA****QUESTIONNAIRE FOR
EXTENSION AGENTS**

This Questionnaire is meant to solicit information and opinions of Extension Agents about the relevance of the Training and Visit extension messages in the farming systems practiced in Wa District of the Upper West Region. Note that all information provided will be treated as private and confidential.

Name of respondent

i. Farmers Participation in Need Identification.

1. Do you involve farmers in the initial planning of your extension activities?
a. Never { } b. Some times [] c. Always []

2. Do you have enough time to listen to their problems?
a. Never { } b. Some times [] c. Always []

3. Does your communication method allow for the incorporation of farmers' problems in your extension programme?
a. Never [] b. Some times [] c. Always []

4. Who decides on what information to pass on to the farmer?

- a. Regional Director: []
- b. Subject Matter Specialist []
- c. District Director []
- d. Extension Agent []
- e. Farmers themselves []
- f. Others specify.....

ii. Farmer-Extension Agent Relationship

5. How will you describe the relationship between you and the farmers?

- a. Not cordial [] b. Cordial [] c. Very cordial []

6. Are your farmers cooperative in extension activities?

- a. Never [] b. Some times [] c. Always []

iii. Consideration of Farmers Socio-economic situation.

7. In the delivery of your information which of the following do you consider as important? (You may tick more than one option)

- a. The farmer's resources that will aid him to put the information into practice []
- b. His beliefs about the information []
- c. The conditions (climate, soils, etc.) of the area []
- d. Taboos of the people within your operational area.[]
- e. Traditional rules and regulations of the people []

8. Do you consider the above situations on the basis of

- a. Individuals [] b. Group [] c. Both []

9. Is the information you send to farmers based on

- a. crops [] b. animals [] c. Both []

10. If both, is the information able to aid them in solving problems related to both?

- a. Yes [] b. No []

iv. Timing of Information

11. Is the information you send always timely (send at the right time) for all the farmers activities?

- a. Yes [] b. No []

12. Are visits to the farmers announced?

- a. Never [] b. Some times [] c. Always []

13. If announced are the visits usually made at the appointed time?

- a. Yes [] b. No []

14. Is information of an operation sent -

- a. Before the farmer begin to implement the operation? []
b. At the time the farmer is implementing the operation? []
c. After the farmer has implemented the operation? []

15. Do you send information according to a cropping calendar?

- a. Yes [] b. NO []

vi. Suitability of Messages

16. How do you obtain the information you pass on to the farmers?

- a. through reading materials []
b. from personal knowledge []
c. from superior officers []

17. Does the information you often send to your farmers satisfy the needs of the farmers?

- a. Never [] b. Some times [] c. Always []

18. If never or sometimes, what could be the cause?

19. How useful does your farmers find the information you send to them?

- a. Never useful [] b. Sometimes useful []
c. Always useful [] d. Others specify -----

20. Please list the problems you meet in the delivery of information to farmers

- a. -----
b. -----
c. -----

21. How will you consider the Training and Visit extension system in the delivery of extension messages?

- a. Not effective [] b. Effective [] c. Very effective []