UNIVERSITY OF CAPE COAST

FARMERS' AND EXTENSION STAFF PERCEPTIONS OF FACTORS AFFECTING THE EFFECTIVENESS OF AGRICULTURAL EXTENSION DELIVERY IN THE ASHANTI REGION OF GHANA

BY

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ABSTRACT

Agricultural production and yields of farms in Ashanti Region are perceived as generally low because most farmers produce crops, using traditional methods or low resource technologies. This situation can be overcome or improved through an intensive and effective agricultural extensive delivery to step up adoption rates of improved technologies by farmers.

The study was conducted at Atwima, Sekyere West, Ahafo-Ano North, Asante Akim North and Adansi East Districts in the Ashanti Region to investigate farmers' and extension staff perceptions of factors affecting the effectiveness of agricultural extension delivery.

Using a descriptive-correlational design, the demographic characteristics of farmers and AEAs, agro-enterprises of farmers, characteristics of technologies, extension information delivery and logistical support factors were examined. The overall effectiveness of agricultural extension delivery was also assessed as well as identification of problems associated with agricultural extension delivery in the Ashanti Region. Furthermore, relationships between the effectiveness of agricultural extension delivery (the dependent variable) and the independent variables of the study were determined.

The results revealed that the mean ages of farmers and AEAs were 55.8 years and 38.9 years respectively. Many, 53.0% and 81.9% of the farmers and AEAs who responded possessed Middle School Leaving Certificate and Certificate in General Agriculture respectively. Majority (74.5%) of the farmers established their farms on family and purchased lands with their personal savings and assistance from money lenders. Over 72.0% of the farmers depended on hired and family labour for farming operations and received one or two visits in a month

from the AEAs. Funding of extension programmes was fairly adequate. Farmers' participation in the planning of extension programmes was high. The AEAs frequently used group discussions and farm visits for education of farmers. Over 60.0% of the farmers perceived the recommended practices as compatible, easy-to-apply with a high relative advantage. The level of competence, motivation of the AEAs and overall effectiveness of agricultural extension delivery (EOAED) was low in the districts.

The EOAED correlated significantly with the number of monthly visits to farmers by AEAs, the overall relative advantage, compatibility of recommended practices, farmers' satisfaction with the overall performance of AEAs, method and result demonstrations. The EOAED also correlated significantly with the level of competence, job satisfaction of AEAs, farm visits and contributions of farmers during group discussions at the 0.05 alpha level.

The results of regression analysis revealed that the compatibility of recommended practices to farmers, farmers' satisfaction with the overall performance of AEAs, use of result demonstrations, job satisfaction of AEAs and contributions of farmers during group discussions were the best predictors of the effectiveness of agricultural extension delivery in the study area.

CANDIDATE'S DECLARATION

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Candidate ..... Date 13/09/05

JOSEPH BERNARD DANKWA

SUPERVISORS' DECLARATION

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines of supervision of thesis laid down by the University of Cape Coast.

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SUPERVISOR

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DEDICATION

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AAGDS - Accelerated Agricultural Growth and Development Strategy

AEA - Agricultural Extension Agent

COCOBOD – Ghana Cocoa Board

CRIG - Cocoa Research Institute of Ghana

CSD - Cocoa Services Division

CSIR - The Council for Scientific and Industrial Research

DADU - District Agricultural Development Unit

DAES - Directorate of Agricultural Extension Services

DDA - District Director of Agriculture

DDO - District Development Officer of MOFA

EOAED - Effectiveness of Agricultural Extension Delivery

EPI - Extension Programme Implementation

EPME - Extension Programme Monitoring and Evaluation

EPP - Extension Programme Planning

FAO - Food and Agriculture Organization

FES - Field Extension Staff

FLEP - Field-level Extension Personnel

GCSDS - Ghana Cocoa Sector Development Strategy

GDP - Gross Domestic Product

GEM - Group Extension Method

GOG - Government of Ghana

GTZ - German Technical Co-operation

IEM - Individual Extension Method

IFAP - International Federation of Agricultural Producers.

ISSER	- Institute of Statistical, Social and Economic Research
KNUST	- Kwame Nkrumah University of Science and Technology
MEM	- Mass Education Method
MES	- Ministry of Environment and Science
MOF	- Ministry of Finance
MOFA	- Ministry of Food and Agriculture
MTADP	- Medium Term Agricultural Development Programme
NAEP	- National Agricultural Extension Project
NARP	- National Agricultural Research Project
NGO	- Non-Governmental Organization
PTD&E	- Participatory Technology Development and Evaluation
RAD	- Regional Agricultural Director
RELC	- Research Extension Linkage Committee
RTIP	- Root and Tuber Improvement Project
SFSP	- Sedentary Farming System Project
SMS	- Subject Matter Specialist
SPSS	- Statistical Package for the Social Sciences
TD	- Technical Department of MOFA
T & V	- Training and Visit Extension System
UAES	- Unified Agricultural Extension System

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Agricultural and rural development in Ghana is important because the vast majority of her people live in rural areas and gain part or all of their livelihoods from some form of agriculture. The development of agriculture implies the shift from traditional methods of production to new, science-based methods of production that include new technological components such as new varieties, commercial fertilizers and pesticides, new crop and new farming systems.

The agricultural sector is the dominant and, by far, the largest sector of Ghana's economy (MOFA, 2003). The sector is made up of cocoa, non-cocoa crops, fisheries, forestry and livestock sub-sectors. The crops sub-sector accounts for over 50% of all agricultural production in Ghana (MOFA, 2003). The sector contributes about 40.5% of the country's Gross Domestic Production (GDP) and 38.6% foreign exchange earnings.

The Government of Ghana (GOG) has adopted an Accelerated Agricultural Growth and Development Strategy (AAGDS) as an important component of its development agenda which aims at increasing the growth rate of agriculture to about 5-6% from the current rate of about 3% (MOFA, 2003).

Sustained agricultural production and incomes are not possible without effective agricultural extension service supported by agricultural research that is relevant to farmers' needs (Benor and Baxter, 1984). Although there can be agricultural development with weak agricultural extension and research services,

continued and widespread improvement requires professional, effective extension and research.

It may not always be possible to quantify precisely the contribution of extension to agricultural development. There is however little doubt that an effective extension contributes significantly and immensely to agricultural development. Effective investment in agricultural extension contributes directly to national wealth through increased agricultural production and enhanced national food security.

In addition, increasing the technical and managerial skills of farm households accelerates the adoption and use of improved technology. Increasing the skills of the farm households also increases the ability of the household members to compete successfully for jobs off the farm when agricultural development occurs and few people are needed in direct agricultural development (Benor and Baxter, 1984).

Most farmers in Ghana have smallholdings and produce crops using traditional methods and low technologies. It is estimated that about 31% of the farm holdings are less than 1.6ha while only 18% are more than 4.0ha per farmer (MOFA. 2003). This signifies the importance of smallholdings in the agricultural production and food security in the country. Effective extension can therefore contribute to agricultural development through both technology transfer and human resources development, particularly among large members of small-scale farmers. The government's overall vision for Ghana is that, over the next ten years, agricultural extension will see a consolidation of existing trends towards a pluralistic service. The commercial farmers will pay for their extension services and subsistence farmers will benefit from public subsidy (MOFA, 2003)

In the short term, the government's vision is that agricultural extension will begin to see a replacement of inefficient, supply-driven, top-down approaches with efficient, demand-oriented, bottom-up approaches based on outputs and outcomes. This, the government envisages, can be achieved through support for a process whereby farmers can benefit from a range of different types of services provided by the private sector, by NGOs or by the public service (MOFA, 2003).

In the medium term, the government anticipates that commercial farmers will source majority of their extension advice from private sector practitioners, and will pay for the services themselves while clusters of outgrowers and farmer-based organizations will pay for an increasing proportion of their extension advice. The Directorate of Agricultural Extension Services (DAES) is therefore charged with the mission to work with the Regional and District Administrations to ensure that extension services contribute in an effective way towards social and economic development of Ghana through:

(i) raising agricultural productivity;

(ii) addressing the specific needs of the rural poor; and

(iii) ensuring that farmers adopt environmentally sustainable approaches.

The DAES is also to evolve sound and pragmatic policies that will assist the government in achieving its vision (MOFA, 2003).

1.2 STATEMENT OF THE PROBLEM

Agricultural development in Ghana has been supported by extension services through the government, the private sector and non-governmental organizations (NGOs). In the early 1990s, the Training and Visit (T & V) system of extension delivery was rationalized through the establishment of a unified

extension service. The unified extension service eliminated duplication of activities whereby the Ministry of Food and Agriculture (MOFA) provided separate services. The MOFA also withdrew from procurement of agricultural inputs (MOFA, 2003).

The available production figures in Ghana indicate that there have been increases for both traditional and non-traditional crops. For instance, cassava, the biggest non-cocoa crop produced in the country, recorded constant increases in production and reached 7.8 metric tons in 1999. Together, starchy crops produced 14.8 million tons in 1999 as against 11.3 million metric tons in 1993. For the same period, cereals (maize, sorghum, rice and millet) showed increases in production (MOFA, 2003). There was also an increase in cocoa production from 312,000 metric tons in 1993 to 420,000 metric tons in 1999.

Production statistics for many of the non-traditional agricultural commodities are not available. However, data on export quantities of the major commodities (cotton seed, cashew nuts, pawpaw, pineapples, kola nuts and banana) showed considerable increases. With the exception of pigs, there were also increases in livestock (cattle, sheep, goats, and poultry) production.

Despite the continual and steady increases, production and yields of crops and livestock in Ghana are generally low and fall short of expectation. For instance, Ghana imports more than $100 million worth of rice annually despite the fact that conditions exist in the country for the production of rice to meet local consumption and for export (Daily Graphic Editorial, 2001).

Agricultural extension delivery in the country has often been criticized and blamed for being one of the causes of the low production and yields. The main criticism levelled against agricultural policy, as a whole, is that it is rigid and not

responsive to the national need. The policy which is meant to be implemented by the field extension staff (FES) is not pluralistic; it is unregulated and not well-co-ordinated from headquarters (MOFA, 2001). There is little or no consultation with the FES on how the policy should be implemented, thus making implementation of the policy difficult.

The management of extension human resources is perceived to be poor by the public. The agricultural extension agents (AEAs) are not enough, aged and aging with a heavy workload, thus resulting in infrequent visits to some farmers. The public also argue that the professional competence of the AEAs is low. The AEAs have poor and unpleasant working conditions and they are less motivated to enable the AEAs perform well.

Furthermore, the extension service is beset with financial constraints. The flow of budgeted resources and release of funds from the Ministry of Finance (MOF) are said to be inadequate and untimely. A well-organized seed money to assist farmers financially is non-existent and farmers have difficulty in procuring credits from financial institutions.

Also the extension service and research institutions are under separate ministries and that creates ineffective co-ordination. Linkages between research, extension and farmers are not well-defined. Farmers intimate that they are inadequately represented on Research-Extension Linkage Committees (RELC) in the Regions and they are seldom involved in the planning of extension programmes.

The public perception of the extension delivery in the Ashanti Region is that the delivery is poor (CSD, 1995). Sometimes, farmers complain, criticize and unreservedly air their misgivings about the extension delivery in the region. This

calls for the need to investigate factors that affect the effectiveness of the agricultural extension delivery in the region and make recommendations for improvements

1.3 RESEARCH OBJECTIVES

1.3.1 Overall Objective

The overall objective of the study is to examine factors that affect the effectiveness of agricultural extension delivery in the Ashanti Region of Ghana.

1.3.2 Specific Objectives

Specifically, the study was to:

1. Examine selected demographic characteristics of farmers and agricultural extension agents of the Ministry of Food and Agriculture (MOFA) and their effects on the effectiveness of agricultural extension delivery (EOAED).
2. Examine agro-enterprises of farmers in the Ashanti Region in terms of:
   i. Modes of land acquisition;
   ii. Types and sizes of agro-enterprise;
   iii. Access to and cost of labour;
   iv. Availability of farm inputs and distances to sources of farm inputs;
   v. Farmers' source (s) of capital for the agro-enterprise;
   vi. Farmer access to credit; and
   vii. Relationships between EOAED and some variables of agro-enterprises.

3. Examine extension information delivery and support factors in terms of :

i) Professional competence and motivation of AEAs;

ii) Farmers' contact with AEAs;

iii) Extension policy and funding of programmes;

iv) Farmers' participation in extension programme planning and implementation;

iv) Logistical support to AEAs;

v) Extension methods used by AEAs;

vi) Linkages between research, extension and farmers;

vii) Reliability of AEAs as perceived by farmers;

viii) Extent of satisfaction with the overall performance of AEAs by farmers;

ix) Availability of markets for farm produce; and

x) Relationship between EOAED and some variables of extension information delivery.

4. Examine characteristics of technologies from farmers' point of view in terms of:

i. Relative advantage;

ii. Compatibility;

iii. Complexity;

iv. Trialability and

v. Observability.

vi. Relationships between EOAED and technological characteristics of recommended practices.

5. Determine farmers and AEAs' perceptions of the overall effectiveness of agricultural extension delivery (EOAED) in the Region;
6. Identify farmers and AEAs' perceived problems associated with extension delivery in the Ashanti Region.

1.4 RESEARCH QUESTIONS

1. Do the demographic characteristics of farmers and the extension staff have any relationships with the effectiveness of agricultural extension delivery (EOAED) in the Ashanti Region?
2. What are the modes of land acquisition, types and sizes of agro-enterprises in the Ashanti Region?
3. Are labour and farm inputs easily available to farmers for establishing and maintenance of their farms/agro-enterprises in the Region?
4. What sources of capital are available to farmers for agro-enterprises?
5. Do the farmers in the Ashanti Region have access to financial credits?
6. Are there any relationships between EOAED and the variables of agro-enterprises?
7. How do the extension staff of MOFA perceive their professional competencies and motivation in the Ashanti Region?
8. Do farmers in the Ashanti Region have contacts with AEAs?
9. Is the agricultural extension policy of MOFA pluralistic, regulated and well co-ordinated for easy implementation?
10. agricultural extension delivery adequately funded in the Region?
11. tent do farmers participate in extension programme planning

12. Are the extension staff supported adequately with logistics for extension delivery in the Ashanti Region?
13. What methods and how effective are the methods used by the extension staff for extension delivery in the Region?
14. What linkages exist between the Research Institutions, Extension and farmers?
15. Are the AEAs reliable in the performance of their duties?
16. To what extent are farmers satisfied with the performance of the AEAs in the Region?
17. Do farmers have ready markets for their farm produce?
18. Are there any relationships between EOAED and the variables of extension information delivery examined?
19. How compatible, complex, trialable, observable and relative advantageous are the recommended practices to farmers in the Region?
20. Are there any relationships between EOAED and technical characteristics of recommended practices?
21. How effective is the agricultural extension delivery in the Ashanti Region?
22. What do farmers and AEAs perceive as problems associated with the extension delivery in the Region?

1.5 THE VARIABLES OF THE STUDY

1.5.1 The Dependent Variable

The dependent variable of the study was 'Effectiveness of agricultural extension delivery' (EOAED).

1.5.2 The Independent Variables

1. Selected demographic characteristics of farmers and extension staff:
   - i. Sex
   - ii. Age
   - iii. Level of education
   - iv. Working experience
2. Agro-enterprises factors of farmers:
   - i. Acquisition of land
   - ii. Types and sizes of agro-enterprise
   - iii. Access to labour and cost of farm inputs
   - iv. Availability of farm inputs and distances to inputs
   - vi. Access to financial credits
   - v. Source(s) of capital
   - vi. Access to financial credit
3. Extension information delivery factors:
   - i. Professional competence of AEAs
   - ii. Motivation of AEAs
   - iii. Farmers' extension contact
   - iv. Extension policy and funding of programmes.
   - v. Farmer participation in extension programme planning and implementation
   - vi. Logistical support for AEAs
   - vii. Extension education methods used
   - viii. Linkages between research institutions, extension and farmers
   - ix. Availability of market

1.6 HYPOTHESES

1. H_o: There are no significant relationships between EOAED and the demographic characteristics of farmers and AEAs.

   H_1: There are significant relationships between EOAED and the demographic characteristics of farmers and AEAs

2. H_o: There are no significant relationships between EOAED and availability of labour and farm inputs.

   H_1: There are significant relationships between EOAED and availability of labour and farm inputs.

3. H_o: There are no significant relationships between EOAED and the professional competence and motivation of the AEAs.

   H_1: There are significant relationships between EOAED and the professional competence and motivation of the AEAs.

4. H_o: There is no significant relationship between EOAED and farmers' contact with AEAS.

   H_1: There is a significant relationship between EOAED and farmers' contacts with AEAs.

5. H_o: There is no significant relationship between EOAED and the farmer participation in planning of extension programmes.

   H_1: There is a significant relationship between EOAED and the farmer participation in planning extension programmes.

6. H_o: There are no significant relationships between EOAED and the extension education methods used by AEAs and farmers' contribution at group meetings.

H_1: There are significant relationships between EOAED and the extension education methods used by AEAs and farmers' contribution at group meetings.

7. H_o: There are no significant relationships between EOAED and reliability of AEAs and farmers' satisfaction with the overall performance of extension staff.

   H_1: There are significant relationships between EOAED and reliability of AEAs and farmers' satisfaction with the overall performance of AEAs.

8. H_o: There is no significant relationship between EOAED and the availability of markets for farm produce/agro-enterprises.

   H_1: There is a significant relationship between EOAED and the availability of markets for farm produce/agro-enterprise.

9. H_o: There are no significant relationships between EOAED and the technological characteristics of recommended practices.

   H_1: There are significant relationships between EOAED and the technological characteristics of recommended practices.

1.7 ASSUMPTIONS

The goals and objectives of an effective agricultural extension delivery are to provide positive changes in the knowledge, skills and attitudes of farmers. This will eventually lead to increases in productivity and production from farms. It is assumed that the sampled farmers and AEAs gave sincere responses to questions that were asked.

1.8 JUSTIFICATION FOR THE STUDY

The agricultural sector plays an important role in the economic development of Ghana. The sector contributes about 41% of Gross Domestic Product (GDP) and accounts for over 40% of export earnings for the country (MOFA, 2001). As most of the poor are dependent on the rural economy for their livelihoods, the performance of the agricultural sector has far-reaching implications for food security, poverty reduction and income generation. Therefore, the importance of agriculture in the national economics and productivity improvement has become more urgent.

Agricultural production and farm yields in Ghana are low (MOFA, 2001). These low production and farm yields are of concern to the government of Ghana (GOG), the Ministry of Food and Agriculture (MOFA), Cocoa Research Institute of Ghana (CRIG), non-governmental organizations (NGOs) and farmers. One of the important factors attributable to the low production and farm yields has been an ineffective agricultural extension service and delivery.

To achieve a higher productivity and significant growth in the agricultural sector, there is the need for a shift in emphasis of farmers from traditional and subsistence production methods to an improved and high level of production. This can be done through intensive and effective agricultural extension services and delivery to step up adoption rates of the improved technologies which have been developed by the Council for Scientific and Industrial Research (CSIR), the Technical Department of MOFA and CRIG (MOFA, 1998). Therefore, the need to resolve the problem of the low production from farms through an effective agricultural extension delivery cannot be over-emphasized since many of the rural people depend on agriculture for a living. There would be increase in food

production, food security, income generation, poverty reduction, among some rural poor and improvements in the standard of living of the people.

The findings of the study will be important and beneficial to the GOG, CSIR, MOFA, CRIG and NGOs in the agricultural sector and farmers. The GOG uses agricultural extension as one of its policy instruments to stimulate agricultural development. From the findings of the study, the GOG will get to know more about farmers' demographic characteristics, farmers' access to credits, extension delivery problems as perceived by AEAs and farmers, among others. With this knowledge, the GOG will be further assisted to formulate realistic and far-reaching policies for agricultural development in the Ashanti Region.

To MOFA, the knowledge about the AEAS and farmers' demographic characteristics, the types and sizes of agro-enterprises, farmers' access to labour and costs of farm inputs, the AEAS' perceived professional competence and their motivation, logistical support and the extent of farmers' participation in extension programmes will help planners and executors in future planning and implementation of programmes.

Research institutions will also benefit from the findings of the study. The findings will guide researchers to make their research to be more adaptive. Furthermore, the findings will throw more light on linkages that exist between research, extension and farmers in the region. The non-governmental organizations (NGOs) and other stakeholders in the agricultural sector will gain more knowledge about agricultural development activities and areas in the Ashanti Region where they will be of assistance.

Farmers' constraints to the effectiveness of agricultural extension delivery (EOED) in the Ashanti Regions will be known. The constraints will be fed to the

research institutions for solution. Significant predictors of EOED will be revealed and this will guide future planners and executors of extension programmes in the region.

1.9 LIMITATIONS OF THE STUDY

The study covered five Districts in the Ashanti Region due to limited resources including time, logistics and funds.

1.10 DEFINITION OF TERMS

This section indicates the meanings of terms used in the study.

Agricultural Extension Agent (AEA): An extension employee of MOFA who is in direct contact with farmers in the field and responsible for providing knowledge and skills in agriculture to them.

Adoption: Defined in this present context as acceptance and use of agricultural technology for one season or more.

Adoption rate: The number of farmers using technologies divided by the total number interviewed multiplied by 100 in a given year.

Contact farmer: A farmer who has been selected by the AEA, the District Director of Agriculture (DDA) and District Development Officer (DDO) of MOFA with the assistance of other farmers to lead and demonstrate farming practices to farmers.

Effectiveness: Defined in this present context as the degree to which the result of agricultural extension delivery is perceived or observed by farmers and AEAs through extension education, adoption of improved agricultural technologies and yields of farms.

Extension technology: Improved and recommended practice on agro-enterprise developed by CSIR, TD of MOFA or CRIG which is extended to farmers by AEA(s).

Extension Staff: Defined in this present context to represent collectively the DDA, DDO and AEAs of MOFA.

Motivation: Functions that supervisors perform to get their employees to achieve goals and objectives

Participation: The process of direct involvement of farmers and the FES in a range of extension activities under programme planning, implementation and evaluation.

Perceptions: Personal indications to disregard some things emphasize others and put meanings in one's own way. Perceptions, opinions and attitudes have the same meaning in this study

Size of agro-enterprise: The crop farm as measured in hectares or total population in the case of livestock.

Agro-enterprise: The word 'agro-enterprise' represents either crop farm or livestock.

Supervisors: Used in this context to refer to the DDAs and DDOs of MOFA in the districts.

1.11. THE STUDY AREA

The research was conducted in the Ashanti Region of Ghana. The Region is bounded on the north by the Brong-Ahafo Region, on the south by the Central Region; on the east by the Eastern Region and on the west by the Brong-Ahafo and Western Regions (Figure 1).

The Ashanti Region has a land area of 24,389km. It is the most populous region in Ghana with a human population of 3.6 million (Ghana Statistical Service, 2002). About 50.3% of its population are males and 49.7% females. Approximately, 1,69 (53.2%) and 1.91(46.8%) millions in the region live in urban and rural areas respectively (Ghana Statistical Service, 2002). The Region has eighteen agricultural districts. Each of the eighteen agricultural districts is manned by a District Director of Agriculture (DDA) and assisted by District Development Officers (DDOs). The DDOs are the immediate supervisors of the agricultural extension agents (AEAs).

Two rainy seasons, interspersed with minor and dry harmattan seasons, are experienced in the Ashanti Region. The rains are experienced from April to July and from September to November every year. The dry harmattan season occurs from December to March. The amount of rainfall recorded annually ranges between 1,000 and 1,800mm (MOFA, 2002). The vegetation cuts across a dense forest zone in the south through marginal and fringe semi-deciduous zones in the north.

About 21.1% of the people in the Ashanti Region are engaged in agriculture and forestry (Ghana Statistical Service, 2002). The farmers grow cash as well as food crops. The crops grown include: cocoa, coffee, oil palm, plantain, cassava, maize and yam. Tomato, egg plant and onions are the vegetables grown.

In the northern sector, farmers grow sorghum, millet and groundnuts, among others. Livestock reared include cattle, sheep, goats, pigs and poultry.

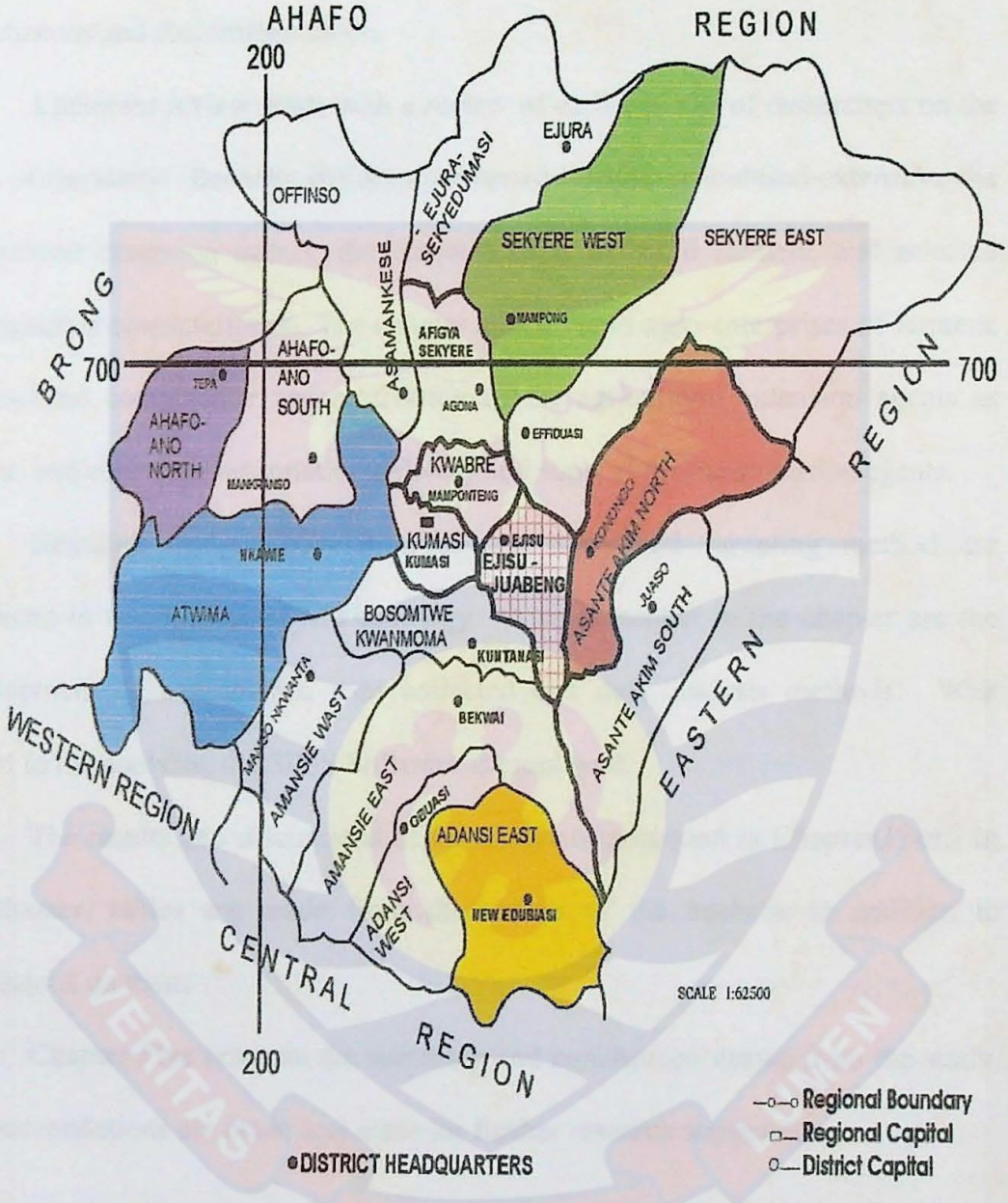

FIG 1: ASHANTI REGION AND THE STUDY AREA

1.12 ORGANISATION OF THE STUDY

From the introduction, the study was organized into the following chapters: Literature review, Methodology, Results and Discussion and Summary, Conclusions and Recommendation.

Literature review deals with a review of earlier works of researchers on the topic of the study. Broadly, the areas reviewed include agricultural extension, the agricultural extension agents, the characteristics of small farmers, and selected demographic characteristics. The chapter also reviews agro-enterprises of farmers, professional competence and motivation of the agricultural extension agents as well as and extension information delivery and support for the extension agents.

Research design, population of the study and sampling method are presented in the chapter of Methodology. Also presented in the chapter are the development of instruments, data collected and data analysis methods. With regard to the analysis, the SPSS Software is employed.

The results and discussions of the study are presented in Chapter Four. In the chapter, tables are made from the results of the analysis in addition to discussions on them.

Chapter Five presents the summary and conclusions drawn from the study. Recommendations are made and areas for further research suggested.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, an attempt is made to review relevant aspects of work done by earlier researchers, as a prelude to the present study. They include the review of books, bulletins, articles and other written accounts which have been published on agricultural extension and delivery.

2.2 AGRICULTURAL EXTENSION

Different people view agricultural extension differently and have defined and interpreted extension differently. However, in all these interpretations, there are common features.

Savile (1965) regards agricultural extension as an evolution of the agricultural advisory service which is regarded as a form of community development effort with an agricultural bias and an educational approach to the problem of rural community. The agricultural advisory service is designed to advise the farmers on improved farming techniques which would be of help to them and also to assist them to implement a benevolent government's plans for the development of the country's economy.

In 1973, Maunder also defined extension as a service or system which assists farm people through educational procedures in improving farm methods and techniques, increasing production efficiency and income, and bettering their levels of living.

The Food and Agriculture Organisation (FAO) (1975) defines agricultural extension as an informal out-of-school educational service for training and influencing farmers (and their families) to adopt improved practices in crop and livestock production, management, conservation and marketing. Extension is also viewed as a teaching process by which information about improved methods of farming is passed on to farmers who have no knowledge about such methods (GTZ, 1977). Thus, according to Swanson (1984), extension is an on-going process of getting useful information to people and then assisting those people to acquire the necessary knowledge, skills and attitudes to utilize effectively the information or technology. Vanden Ban (1986) on his part, has defined extension as 'purposeful assistance to decision making and opinion formation'.

2.2.1 The Role of Agricultural Extension

Sustained high levels of agricultural production and incomes are not possible without effective agricultural extension services supported by agricultural research that is relevant to farmers' needs (Benor and Baxter, 1984). Although there can be agricultural development with weak agricultural extension and research services, continued and widespread improvement requires professional, effective extension and research.

In many developing countries, rural farm households and their agricultural land collectively represent the most important national resources; yet, in too many countries, these human and natural resources remain stagnant and largely untapped. An adequate and sustained instrument in agricultural research and extension is the most effective means of transferring these under-used resources into sustained agricultural development for national economic growth.

It may not always be possible precisely to quantify the contribution of extension to agricultural development. There is however, little doubt that an effective extension contributes significantly and immensely to agricultural development. Effective investment in agricultural extension contributes directly to national wealth through increased agricultural production and enhanced national food security.

In addition, increasing the technical and managerial skills of farm households, not only accelerates the adoption and use of improved technology but also increases the ability of farm household members to successfully compete for jobs off the farm when agricultural development occurs and few people are needed in direct agricultural production.

Extension can contribute to agricultural development through both technology transfer and human resources development, particularly among large members of small-scale farmers of developing countries. These roles are not mutually exclusive. Agricultural extension aims at the following:

i. It teaches farmers in rural communities how to identify and assess their needs and problems;

ii. It helps farmers acquire knowledge and skills required in coping with their needs;

iii. It inspires farmers to actions that improve the quality of their lives;

iv. At its best, extension focuses on helping people to convince themselves of the benefits of scientific information, new technologies, practices and alternative approaches to solving problems or managing their own affairs;

v. Extension links farmers to research based and tested technology, practices and inputs that are expected to benefit them. Savile (1965), was of the view that without the help of extension, the research findings would remain hidden in reports;

vi. According to Swanson (1984), since agricultural development implies a shift from the traditional method of production to new resource based methods of production that include new technological components, (such as new crop varieties, cultural practices etc) agricultural extension should teach farmers management and decision making skills as new technology is developed and also to help rural people develop leadership and organizational skills. They can then better organize, operate and participate in co-operatives, credit associations and other support organizations and also to participate fully in the development of their local communities; and

vii. Extension provides farm management advisory service.

2.2.2 The Development of Agricultural Extension in Ghana

Agricultural extension started in Ghana at Aburi Botanical Gardens in 1890 in the nineteenth century where few school leavers were trained and sent out as travelling instructors to teach farmers in Akwuapim Hills on improved production technology of some important crops, with emphasis on cocoa (MOFA, 2003). La-Anyane (1985) states that this training was done for about 20 years before the Basel Missionaries started with their extension services in Ghana. A number of re-organisations occurred within the extension service in the past, which led to the creation of parallel extension departments. The farmer is therefore confronted with

different extension agents who talk to him on different technical contents and approaches. Following the launching of the Economic Recovery Programme (ERP) in 1983 there has been a major re-organization of the extension service.

In 1992, a Unified Agricultural Extension System (UAES) was established. The primary objective of the UAES is to achieve sustainable increase in agricultural production, and to improve the nutrition and incomes of extension clientele through the enhanced adoption of technology, using one agricultural extension agent (AEA) who has been given a multi-disciplinary training. The system has the following specific objectives:

i. to improve efficiency in management and delivery of extension services;
ii. to improve the relevance of technology available to farmers, and in particular, indigenous technologies developed by farmers themselves;
iii. to organize farmers into groups and associations in order to improve their income through better access to inputs, credit and markets for their produce;
iv. to increase the involvement of farmers in the identification of areas where further research is needed, and develop technology with their collaboration; and
v. to strengthen the existing framework for human resource development in the sector and forge linkages between research, teaching and extension

(Korang-Amoako et al, 1994).

A draft report on orientation workshop that was held in Winneba, 1997 states that, the Unified Agricultural Extension System was supposed to address the weaknesses in the general extension. The report indicates that the main feature of the unified extension system is the Training and Visit (T & V). It stresses the importance of organization management, systematic training, research-extension

linkages and strong field orientation where the main focus is on extension educational activities. The report concludes that the main features of the unified extension have enough ingredients to motivate any extension agent to improve upon his/her performance.

2.2.3 Model of Extension in Ghana

The Unified Agricultural Extension System (UAES) employs a modified version of the Training and Visit (T&V) model of extension developed for the World Bank by Daniel Benor, a former director of Israeli Extension Service (Benor, 1984). As recommended by Benor (1984), it is an effective management model that enables the efficient implementation of known extension principles. Van den Ban and Hawkins (1996) have stated that, the T&V has been one of the most significant organizational developments in the world during the last two decades and indicated that billions of dollars have been invested in this system by the World Bank since 1975. The model is perceived basically as being top-down in the transfer of technology from research-extension-farmer. Top managers plan extension programmes, and regions and districts implement them

2.2.4 The Main Features of the T&V System

Benor and Baxter (1984) suggest that the T&V system must be adapted to fit local conditions. They further advise that certain features of the system can not be changed significantly without adversely affecting its operation. They include: (i) professionalism, (ii) a single line of command, (iii) concentration of effort, (iv) time-bound work, (v) field and farmer orientation (vi) regular and continuous training, and (vii) close linkages with research.

i. Professionalism: Appropriate advice and support of farmers to enable them increase their incomes can only come from an extension service that is professional at all levels. Extension staff must keep in close touch with relevant scientific developments and research in order to formulate specific recommendations that will be useful to the farmers in all kinds of resource situations. They must have the ability to identify production constraints in the field and to develop appropriate measures to counter them. This can be achieved only if each extension worker is fully and continuously trained to handle his particular responsibilities in a professional manner.

ii. Single Line of Command: The extension service must be under a single line of technical and administrative command. All extension workers should be responsible administratively and technically to a unit within only one department.

iii. Concentration of Effort: Effective training and visit extension is based on a concentration of effort. Only by concentration on the tasks at hand can the impact of extension become visible and can progress be sustained. Concentration of effort is a feature of all aspects of the system. All extension staff work only on agricultural extension. The staff are not responsible for the supply of inputs, data collection, distribution of subsidies, processing of loans, or any other activity not directly related to extension (Benor and Baxter, 1990). Non-extension activities dilute concentration of effort and undermine the professionalism of the service and its credibility among farmers; hinder single line of command; interrupts work and training schedules; and weakens the required two-way linkage with research.

iv. Time-bound Work: Messages must be taught to farmers in a regular, timely fashion, so that they will make the best use of the resources at their command.

The village extension agent must visit his farmers regularly on a fixed day. All other extension staff must make timely and regular visits to the field, as required, to fulfil their job responsibilities.

v. Field and Farmer Orientation: An extension service must be in contact with farmers to serve them effectively. The farmers served by the village extension worker are to be divided into groups, each group visited on a fixed day once in two-weeks by the village extension worker (VEW). Trainers and District Extension Officers and other senior staff, must visit the field often and regularly to understand the problems faced by farmers and extension workers. To enable extension workers to spend time in the field, their administrative and report-writing responsibilities should be minimal.

vi. Regular and Continuous Training: Regular and continuous training is required both to teach and discuss with extension staff, the specific production recommendations required by farmers and to upgrade and update their professional skills (Benor and Baxter, 1990). The basic fortnightly training and monthly workshops are a key means of bringing actual farmers' problems to the attention of research, of identifying research findings of immediate relevance to farmers, and of developing production recommendations that would fit specific local conditions. The training should impart the necessary extension knowledge to trainees and

assist in the exchange of information among staff and help them learn from each other's experiences.

vii. Close Linkages with Research: Rogers (1983) defines a link as a communication relationship between two units in a system. Benor and Baxter (1990), argue that agricultural extension and research are mutually dependent. They depend on one another for their successful operation. Extension requires the findings of research to teach to farmers, as well as the support of research in solving farmers' problems. Without research involvement, it is unlikely that extension will be able to teach significantly improved practices (including new varieties, crops, and cropping patterns) that lead to the market increase in productivity required for rapid, sustained agricultural growth. Similarly, research requires extension's guidance on problems that farmers face and on new issues that become apparent from field exposure and on which research attention should be focused.

2.2.5 The Strengths of the T & V Extension System

Benor and Baxter (1990) identify the following strengths of the T & V extension system/model:

i. The T & V model has been widely adopted and has proven results and adaptability to a wide range of agricultural and administrative environments in developing countries. It has been taken up either explicitly or implicitly at national or local levels by about forty (40) countries in Eastern and Western Africa, South and Southeast Asia, the Middle East, Europe and Central and South America. One reason for the rapid spread of the system, developed only in the mid-1970s, has been the impressive increases in

agricultural production that have been associated with its introduction (Benor and Baxter, 1990).

ii. The T&V system appeals to policy-makers because it proposes a method whereby large and moribund extension organization could be mobilized at a small incremental recurrent cost.

iii. The T &V system upgrades the calibre of extension agents by means of continual on-the-job training and increases contact between extension agents and farmers. It is often able to ensure that available research data are actually used; this can reorient research to focus properly on problems of importance to farmers.

iv. The T&V system changes the attitudes of extension staff because of rigid training and control of extension agents.

v. The T&V system effectively mobilizes the relevant results derived locally from participatory farming systems because it has the ability to organize public servants for the broad dissemination of information (Roberts, 1989).

2.2.6 Critique of T&V Extension System

i. The T&V system is basically top-down in its orientation and that it responds more to the desired modus operandi of the bureaucrat than to the needs of a community and its farmers.

ii. Sometimes, the upward flow of information does not take place or takes place sporadically because the extension system is set up to permit information to flow downward from those who know to those who, supposedly, do not know.

iii. The T&V extension depends on the use of contact farmers. These contact farmers are usually selected by the extension service and are supposed to represent the range of socio-economic groups found in a particular locality. Howell (1984) argues that in practice, local pressures and staff performances often tend to bias selection in favour of the richer or more powerful farmers.

iv. For the T&V system to have an impact, research must support it strongly, co-ordinate with extension, and tackle farmers' immediate problems; production recommendations taught to farmers must be relevant to their needs and resource conditions, be economically viable; and regular and special training of extension staff must be timely and specific to their needs.

v. The T&V development has involved either a major build up of personnel in the extension service or the injection of critical funds to cover operating costs, which extension has been denied; a relatively costless re-organization of an existing programme is not enough. The concentration of effort associated with a successful T&V system therefore tends to be expensive, and under today's constrained budgetary scenarios, it is not generally something that governments (of developing countries) can afford without a good deal of external assistance.

vi. The economic benefits from the T&V system may indeed be considerable but they may not be captured as government revenue, let alone reflected in greater budgetary allocations to extension (Roberts, 1988).

vii. It is argued that by adopting the T&V system, governments run an implicit risk that the resultant cost burden may not be easily sustainable without

continued external assistance. The cost of actual recovery is one that has so far elicited little real interest from T&V system designers.

2.3 AGRICULTURAL EXTENSION AGENTS (AEAs).

According to Van den Ban and Hawkins (1996), the most important resource available to an extension service is its staff members. Different and usually higher standards are expected of them under conditions of change. A great deal of responsibilities of bringing about change in farmers and other clientele rest on the shoulders of the agricultural extension agents (AEAs). The AEAs are the contact men and women at the field level who are in direct contact with farmers.

Swanson, Bahal and Farmer (1990) report on the worldwide percentage of extension personnel by position and state that the ratio of field staff (AEAs) is low in Africa and Asia and varies from 1:11 to 1:14 as compared to from 1:1.5 to 1:1.6 for European and North American countries. In Ghana, AEAs form about 90 percent of the total manpower resource of the extension system with an AEA : Farmer ratio of about 1:1200 (MOFA, 2002).

The AEAs are responsible for the implementation of extension programmes at the field level; and their effectiveness can often determine the success or failure of an extension programme, as they are the critical elements in all agricultural extension activities. Benor, Harrison and Baxter (1984) have asserted that the responsibility of all other extension staff is ultimately to make the AEAs more effective in their work.

Vijayarajaran and Singh, (1997) assign three basic functions to the AEAs in general:

1. they make regular and systematic visits to villages and farms to develop rapport with the clientele to understand their problems,
2. they undertake educational activities in the form of meetings, campaigns, demonstrations, field days, training sessions and exhibitions and
3. they provide advisory service to farmers and solve their production problems.

In Ghana, the AEAs perform the following duties and responsibilities:

- Compile base line geo-climatic, socio-cultural and economic (including agriculture) data on the area of operation.
- Identify or establish contact Farmer Groups for purposes of achieving wider coverage in crops, livestock, fisheries and related activities or services.
- Prepare route maps and visit schedules in collaboration with the Field supervisor.
- Assist farmers in the diagnosis of farm and farming related problems and advise on solution to such problems.
- Participate with researchers and SMS in the establishment of On-Farm Adaptive Trials and collect relevant data for analysis by SMS or researcher.
- Assist farmers in the establishment of Mini-Demos and arrange field days for contact groups and assess the results with farmers and SMS.
- Participate with SMS and Supervisors in the identification, prioritisation, and implementation of extension themes.
- Identify and forecast crop, livestock and fish pests and diseases and advise on means of control with the assistance of the relevant SMS.
- Promote vigorously the development of all women specific programmes.

- Assist farmers in farm management education and practice in order to have cost effective farming enterprise.
- Participate with the Department of Co-operatives, NGOs etc in the process of group formation and organisation.
- Identify with educational institutions (JSS/SSS) and NGOs etc in order to exchange view and collectively assist in the agricultural development in the locality.
- Assist farmers with information on the availability of farm inputs, credit support and marketing.
- Undertake field level measurements, such as crop-cutting etc. for purposes of productivity estimation, monitoring and evaluation.
- Provide feedback from farmers or agricultural related operators for management decision.
- Prepare daily log record of day's work and observation
- Prepare and submit to the District Director of Food and Agriculture monthly and/or quarterly report through his/her Field Superior Officer.
- To undertake any other duties that may be assigned (MOFA, 2002).

2.4 THE CHARACTERISTICS OF 'SMALL FARMERS'

Most of the farmers in Ghana have small holdings and produce crops using traditional methods or low resource technologies. It is estimated that about 31 percent of the farm holdings are less than one hectare, 51 percent are less than 1.6 hectares while only 18 percent are more than 4.0 hectares per farmer (MOFA, 2003). Albrecht (1989) describes 'small farmers' as follows:

i. They are owners or leaseholders of family holdings; the household and the farm form a single unit.

ii. They carry on arable farming and animal breeding, predominantly to guarantee subsistence

iii. Their resources (labour, land, capital, information) are, as a rule, scarce and in the long term sometimes in decline.

iv. They cannot find perfect safeguards, no matter how much care they take, and they are at the mercy of harvest failures.

v. They often have the feeling, based on long experience and tradition, of always being the underdog in their dealings with the outside world and with more prosperous or better educated people.

vi. When dealing with people in authority small farmers often do not have the opportunity for open discussion.

vii. In the community, the individual is part of a network of demands and obligations to provide mutual support and help.

2.5 SELECTED DEMOGRAPHIC CHARACTERISTICS OF FARMERS AND EXTENSION WORKERS

Some characteristics of farmers and extension workers are believed to have influence on their performance. This had been revealed by research findings of earlier researchers including Celis (1971), Adewuni, (1976), Byrness and Byrness, (1978), Cernea, (1981), Nelson, (1981), Budke and Paddie, (1994), and Beilin, (1995).

2.5.1 Age of Farmers

La-Anyane (1985) reports that the average age of the farming community in Ghana lies between 50 and 60 years and this affects productivity. In many cases, health and declining age have a positive relationship between age and work a farmer can do.

MASDAR Consultancy (1997) undertook a training needs assessment survey for trainers, extension workers and cocoa farmers in the cocoa industry of Ghana.The MASDAR Consultancy Report (1997) grouped the age of cocoa farmers in Ghana into old and young. The older cocoa farmers are 50 and above. The consultants reported that age is one of the major constraints to increased production of cocoa. The older farmers are less able to perform heavy tasks such as spraying which also involves transporting large quantities of water as well as manipulating heavy spraying machine.

2.5.2 Age of Extension Workers

Sabihi (1978) reports that young agents and specialists perceive a greater need for training in extension philosophy, organization and administration than older agents and specialists.

In a study of the relationship between supervisory techniques of extension supervisors and organizational outcomes in Uganda, Budke and Paddie (1994) found out that older extension agents tend to exert less extra effort and are less satisfied with their supervisors and rate them low on organizational effectiveness.

2.5.3 Sex

Rural men and women may have different needs and desires. Nelson (1981) supports this theory when she writes that it is wrong to assume that an effective development programme for males will automatically translate into an effective programme for women, as well.

Roberts (1989) refers to women as 'mother earth' and implies that it is the responsibility of women to nurture a land and that the long standing emphasis on women's domestic labour, principally child rearing has always masked their visible participation in the area of production. Whatmore (1988) argues effectively that an analysis of women's work in family farming offers a counterpart to simplistic attempts to divide their input into domestic or wage labour.

Beilin (1995) gives an account of her experience in village agriculture in the 1980s at Oro Province in Papua New Guinea. She observed in Oro Province that technology transfer was the key element in the agricultural extension service, and as most of the extension agents were men, the technology was transferred to men even though women were the key subsistence farmers and the field labourers in plantation crops. Beilin concluded that the extension agents tended to meet with key individual farmers, who were really likely to be important village men and least likely to work in the fields.

2.5.4 Educational Level of Farmers

Byrness and Byrness (1978) suggest that education enhances one's ability to receive, decode, and understand information and that information processing and interpretation are important for performing many jobs. They state further that a farmer's level of education, to some extent, determines the type of tasks he can

undertake in any programme, and therefore the type and level of participation. Education may make a farmer more receptive to advice from an extension agency or more, able to deal with technical recommendations that require a certain level of literacy. It again affects the farmer's ability to decode information about new technology and prices of inputs, and how to relate this to farming operations. In countries where educational levels are high in the rural areas, farmers can read about new technologies on printed bulletins and try them while others will observe and follow (Gordon, 1976).

Cernea (1981) explains that the ability to process information is particularly important in farming which entails, what he calls, a diversified set of activities for which allocative decisions are made continuously as part of the normal routine. Therefore, a farmer with a higher level of education is expected to be able to participate in more extension activities than one with a lower level of education. Sukaryo (1983) stresses the importance of education to farmer participation in agricultural extension programmes and adoption. He explains that participation in agricultural programmes and adoption usually involves farmers acquiring and decoding information about modern inputs and in learning how to use these inputs efficiently. Therefore, farmers who have low level of schooling may require longer time lags to select, assimilate, and allocate new farming skills and inputs. Farmers' level of participation is thus influenced by their level of education.

2.5.5 Educational Level of Extension Workers

In Adewuni's (1976) study, the general trend of rating was that Bachelor of Science (BSc) degree holders rated themselves lower than Master of Science (MSC) degree holders whilst, according to Sabihi (1978), extension agents with

lower educational levels perceive a greater need for training in extension philosophy, organization, administration and evaluation. Amon (1989) suggests that the qualification of middle level administrators and supervisors should be a university degree with special training in extension education.

2.5.6 Working Experience

Celis (1971) finds that Mexican extension agents with less than 3 years experience express a greater need for technical information, while those with more than 3 years express a need for training in the social sciences/agricultural extension. Sabihi (1978) also reports that specialists who have more experience perceive a lesser need for training in extension philosophy, organization in administration. According to Budke and Paddie (1994), supervisors who hold their positions for a long period of time tend to generate less extra effort.

2.6 EXAMINATION OF AGRO-ENTERPRISES OF FARMERS

2.6.1 Land Acquisition and Tenure System

In Ghana cocoa land is believed to be held mainly on freehold by land owners consisting of individual families and clans through inheritance from clan or family and by land purchase. It is also believed that in the Ashanti Region migrant farmers are entitled to usufruct rights only (MOF, 1998).

Fragmentation of cocoa farms through inheritance has reduced previously large cocoa farms to small holdings, with some as small as 0.4 ha and less. Recently, it has become more difficult to obtain land through outright purchase in the more populous areas in the Ashanti Region (MOF, 1998).The nature of contracts for land acquisition neither provides sufficient security of tenure nor

incentives to migrant farmers who are believed to be better capitalized to invest. This may hinder the diffusion of innovative practices in the industry.

The non-uniformity of land acquisition contracts and lack of a consistent and formalized regulatory system for cocoa farmland may also act as a major constraint to the dissemination of new ideas by migrant farmers (MOF, 1998). Access to institutional credit is believed to be hampered when land is not self-owned to serve as collateral for loans. This situation would indirectly affect adoption especially where finance constitutes a major problem.

2.6.2 Access to Labour

The agricultural labour force is defined to cover those engaged in agriculture, in livestock production and in agricultural services (Rourke, 1986).

To ensure abundant food supplies for the urban worker and the urban elite and provide exports and raw materials for local industries, policy-makers in Ghana in the past decade have been eager to increase agricultural production. Much concern also has been expressed about the persistent migration of labour from rural to urban areas, particularly of the educated youth and the alleged increasing age of farmers and others engaged in agriculture.

As little capital equipment is used in agricultural production in Ghana, the supply and mode of organization of the agricultural labour force is a key determinant of the volume of agricultural production (Rourke, 1986). For many years, large numbers of labourers have been employed in the agricultural sector by farmers. Most of those labourers have come from Burkina Faso, Mali, Togo and Northern Ghana and have had little or no schooling. For this reason, the youth in

Southern Ghana with some schooling, and even those without schooling, considered such work as unsuitable for them (Rourke, 1986).

Labour from family sources is also now scarce because of out-migration of children and other dependants. There are seasonal bottlenecks of labour supply during periods of profuse weed growth (May/June). The availability of more rewarding opportunities for labourers, eg. in mining, has also reduced the supply of labour. This increases the price of hired labour for agricultural production. Access to labour can be facilitated through measures to improve cash-flows to farmers such as seasonal credit to enable them hire and pay for labour.

2.6.3 Access to Financial Credit

2.6.3.1 Definition of Credit

Cowie (1989) defines credit as a permission to delay payment for goods and services until after they have been received. He also sees credit as the sum of money lent by a bank. To Owusu-Acheampong (1986), credit is a 'temporary transfer of capital resource from an individual or institution to another person or institution for a specific period of time, purpose and at agreed interest change'.

2.6.3.2 Role of Credit

The most critical factor in the Ghanaian rural farming situation is credit (Owusu-Acheampong, 1986). Credit can play a very important role in rural development. With credit, unproductive traditional farming can be transformed by modern techniques of farming, utilizing more sophisticated equipment and other essential inputs recommended by the extension FLS. Farmers can acquire farm machinery and equipment that can help them to increase their hectarage (acreage).

With credit, farmers can buy and use essential inputs such as fertilizers, improved seeds, insecticides, weedicides and pesticides.

The crucial point is that with credit, the farmer can increase his productivity which in turn would ensure greater farm output and increased income. With the proper utilization of the increased income, the farmer can bring out considerable improvement in his welfare and living conditions. Thus, the individual farmers collectively can bring about considerable improvement in the community in which they live. Credit can play a very important role of a catalyst in the development process. But for it to be a strong catalyst, it has to be made an integral part of the programme covering input supply, marketing, processing, storage and advisory services.

2.6.3.3 Sources of Credit

In Ghana, credit sources in rural and urban communities are non-institutional and institutional credit agencies. The non-institutional credit sources include:

i. relatives and friends;

ii. private money-lenders;

iii. traders;

iv. distributors of farm inputs; and

v. processing of agricultural products.

Owusu-Acheampong (1986) further states that of all these agencies, the private money-lender is the most prominent and well-known. The relatives and friends constituting themselves into unorganized credit givers are perhaps the oldest of the non-institutionized sources of credit.

A Government Committee on Agricultural Indebtedness (1968) reports that socially the money-lender is an asset to the village farming community and he is held in high esteem. The lender is approachable and he is ready to lend at a short notice. However, Harvers (1960) reports on the rates of interest and terms of repayment of money-lenders and describes them as exorbitant and harsh. Their interest rates are very high and range between 50% and 100%.

No meaningful rural development programme in Ghana can be implemented on the limited resources of credit available from the non-institutionalized agencies. Permanent and formal sources of credit are pre-requisite to a smooth development process.

In Ghana, the financial institutions are biased against agriculture and rural credit; they prefer to lend to urban-based sectors such as trade and industry (Owusu-Acheampong, 1986). Owusu-Acheampong further states that the usual reason given for this bias is the inability of the rural man to offer adequate security for loans and the enormous risks associated with agricultural production. The large number of small loans, coupled with geographical dispersion, makes rural credit considerably more expensive to administer.

2.7 PROFESSIONAL COMPETENCE OF AEAs

The effects of extension work depend to a large extent on the professional competence of the extension agents (Van den Ban and Hawkins, 1996). Some extension programmes do not produce benefits sufficient to justify their costs. This situation can occur when extension personnel have low levels of competence or when little new relevant technology is available to extend (Evenson, 1984).

2.7.1 Developing Competence of Extension Workers

Several researchers have examined when professional competence should be developed by extension agents. Gonzalez (1982) identifies 144 competencies needed by extension agents in Pennsylvania. Of the 144 competencies, 26 were identified as very important before entering the job, 6 during a graduate programme and the remaining 112 through in service training education.

Ayewoh (1983) also reports that extension agents in Bendel State in Nigeria identified that 59 selected professional competencies, should be learned on the job through workshops, seminars, orientation programmes, induction programmes, symposia, conferences, training sections, and demonstrations.

In Kenya, Ogondo (1984) reports that extension agents perceived that all professional competencies in the area of programme planning, programme execution, communication, maintaining professionalism, and evaluation should be learned on the job. However, competencies in the category of administration and others related to extension philosophy, history, knowledge, understanding human behaviour, and teaching should be learned before entering the job.

Easter (1985) finds that a majority of the competencies should be learned through in-service training while Van den Ban and Hawkins (1996) are of the view that all extension services require a systematic in-service training programme, but it is especially important in those services which have had to attract extension agents with a rather low level of competence because of the lack of well-trained agriculturists in their country. They find two types of training desirable:

i. Regular training at staff meetings to ensure agents are capable of performing their work satisfactorily in the next few weeks. This

training may be given mainly by the Subject Matter Specialists (SMS) and extension managers.

ii. A series of short courses to increase agents' competence in specific fields. These courses may be given by SMSs and by the staff of training centres. The courses may focus on an aspect of production technology or on extension methods.

2.7.2 Supervision

Supervision, as defined by Collings (1972), is a process by which workers are helped to do their jobs with increasing satisfaction to themselves, to the people with whom they work, and to the agency. Extension supervision is concerned with the improvement or growth of extension personnel as individuals and as educational leaders.

In contributing to individual growth, the goal of supervision is the maximum development of the potential capacities of the extension agent as a person. In contributing to the effectiveness of the worker as an educational leader, its goal is to provide the best possible extension programme for the people of the country. Through activity and habitual practice, supervisors live out the process which we call supervision and demonstrate the extent to which they meet criteria.

By a review of the literature, the underlisted criteria have been identified with supervision. A good supervisor:

- is guided by clear purposes;
- guides agents to get job done, to carry out the purposes of the agency;
- concentrates his/her supervisory programmes on helping to meet needs;
- makes a careful analysis of the needs of each individual agent;

- makes supervision a co-operative activity. He or she draws on the ideas and experience of all staff members;
- assumes responsibility to develop staff competence. He or she motivates professional improvements;
- studies the extension job;
- uses evaluation to improve every major phase of extension programmes.
- evaluates his/her own effectiveness; and
- demonstrates a desire to be of assistance to the agents, (Collings, 1972).

According to Benor and Baxter (1984), supervision should determine whether the extension system is operating effectively in both organizational and technical areas, and identify key constraints to its effectiveness. Common constraints may be the result of the fact that the Village Extension Worker (VEW) and other staff are not interested in their work or do not undertake the required appropriate messages to teach farmers, training is inadequate, or leadership and guidance for extension staff is poor.

Benor and Baxter (1984) also specify that supervision of extension activities should not be paper-based or report-oriented as staff are not evaluated on the basis of paper work or written reports they produce. Very few reports are required of any extension staff. Village extension workers (VEWs) are only required to keep a daily diary to record their activities and the main problems they encounter in the field, especially with respect to farmers' reactions to production recommendations.

The purpose of extension supervision is not merely to check that staff do their work in a correct and timely manner: more important is the objective of assisting and guiding staff to do their assigned duties effectively. The schedule of

visits of the supervisors should normally be known to all staff. Unscheduled visits are made to check on staff who may not be performing adequately, or in response to particular field or training problems. Benor and Baxter add that since supervision cannot be conducted through a review of written reports, it must be done at the location where the activity to be supervised normally takes place; field activities are supervised in the field, training is supervised in training sessions.

In the view of Benor and Baxter (1984), supervisory visits to the field focus on organizational (methodological) and technical matters. The importance given to either depends on the level of responsibility of staff making the visit. Most important, however, is to check the end result: Do farmers benefit from extension? This check should be done by supervisors at all levels.

To Stoner and Freeman (1992), a supervisor who looks upon newcomers as potentially outstanding performers will treat them accordingly thereby motivating them to do their best – and the supervisors expectation will tend to be confirmed. Conversely, a supervisor who expects newcomers to perform poorly will communicate these expectations directly or indirectly, thereby triggering the indifferent performances that fulfil the negative expectations.

2.7.3 Measuring Competence

It is commonly accepted that any professional practice domain is complex and multi-dimensional (Pottinger, 1979). Pottinger adds that clearly, how one defines the domain of competence will greatly affect one's choice of measurement procedures.

According to Pottinger if one considers behaviours a part of competence, then tests must be on behaviours which reflect this aspect of competence

simulation techniques. Also, if one considers personal attributes such as empathy, well-developed cognitive processes, moral reasoning abilities, interpersonal effectiveness, or motivation as important aspects of competence then these attributes must also be reflected in the assessment process.

Pottinger (1979) identifies three cognitive skills related to competence performance in a broad array of occupations. One is the ability to see thematic consistencies in diverse information and the ability to organize and communicate those differences. A second related cognitive skill is the ability to conceptualise the many sides of a controversial issue. A third cognitive skill that Pottinger (1979) finds, often taken for granted, is the ability to learn from experience.

In the past, someone was judged to be professionally competent by the outcome of his work. A farmer was competent if his crops grew, a mechanic if his engine ran; a teacher if her students learned and their parents were pleased, and so forth. In each case, competence was demonstrated by the observable quality of some outcome. As long as consumers could freely choose their service providers and judge the quality of outcomes-however subjectively-this determination of competence was viable and socially acceptable (Pottinger, 1979).

Recently, educators and other professionals have adopted the jargon of job relatedness by distinguishing between tests of academic knowledge, or 'competency based' tests. This distinction is trivial, because the quality of job performance outcomes – the only real evidence of competence – is not required in either type of test, Pottinger (1979).

Ayewoh, (1983) and Ogondo (1984) have identified professional competencies needed by extension personnel in various countries. Findings from their studies indicate that extension agents in developing countries should possess

professional competence in the areas of administration, programme planning and execution, evaluation, communications, teaching and extension methods and understanding human behaviour.

In the study of participatory management training needs of extension personnel in Zambia, Aguanga (1989) identify job satisfaction and level of proficiency of supervisors in the areas of management and communication skills to be related. The officers are more satisfied in their jobs when their supervisors are better communicators, involve them in decision-making processes, make them feel a part of the department, allow them to use their skills and abilities and provide variety and challenge to the job.

2.8 MOTIVATION OF FIELD EXTENSION STAFF (FES)

The most important resource available to an extension service is its staff members (Van den Ban and Hawkins, 1994). Personnel matters therefore play a very important role in extension work. Managers must ensure the quality of their extension staff as much as possible. One of the ways is by motivating the extension staff to enable them give their best. Pleasant working conditions and incentives provided by an employer are factors that motivate staff to greater effort. Mitchel (1982) notes that performance was influenced by a minimum of four factors including motivation.

2.8.1 Definition of Motivation

The definition of motivation varies partly because authors tend to formulate definitions in terms of specific theories and partly because motivation is an extremely complex concept.

According to Kast and Rosenzweig (1985), motivation is 'what prompts a person to act in a certain way or at least develop a propensity for specific behaviour; Wlodkowaski (1985) describes motivation as those processes that can:

i. arouse and instigate behaviour,

ii. give direction or purpose to behaviour

iii. continue to allow behaviour, and

iv. lead to choosing or preferring a particular behaviour.

Szilagyi (1988) states the following as a workable definition of motivation 'Either an internal or external drive that directs a person towards need satisfaction or a goal'. He notes that there are two ways of viewing motivation. According to Szilagyi, the first view of motivation is the individual motivation which represents an unsatisfied need that creates a state of tension (dis-equilibrium) causing the individual to move in a goal-directed pattern towards need satisfaction and equilibrium. He implied from this view that the aim of behaviour is to reduce tension by achieving a goal that will satisfy that need.

The second view of motivation, according to Szilagyi, is the traditional way where motivation is viewed as a process of directing, stimulating or actuating people to action in order to accomplish a desired goal. Based on this definition, he (Szilagyi) finally states that motivation is a function supervisors perform to get their employees to achieve goals and objectives.

Motivation is also defined by Kreitner (1989) as the psychological process that gives purpose, direction and intensity to behaviour. Differences in motivation therefore, are the most important consideration in understanding and predicting individual differences and behaviour in the work setting.

2.8.2 Theories of Motivation

Several motivation theories have attempted to explain human behaviour. However, all the theories fall under two categories; the content and process theories.

The content theories focus on factors within a person that energize, direct, sustain and stop behaviour, eg. Maslow Hierarchy of Basic Needs Theory and Herzberg 'Two-Factor' Theory.

In contrast to the content approaches to motivation which are concerned with what motivates individuals to behave the way they do, the process approaches are concerned with how the individuals are motivated or how work related factors can start the motivational factors, e.g. Vroom Expectancy Theory, Adams Equity Theory, Skinner Reinforcement Theory, McClelland Achievement Theory and Locke - Goal-setting theory.

According to theorist Abraham Maslow (1943), people are motivated to satisfy certain needs ranging from the very basic and bodily needs to the very complex and psychological need. Maslow groups the needs as survival, security, affiliation, recognition and self-actualization. It is assumed that as one level of needs is fulfilled, one moves on to the next; and that once a need level is satisfied, it no longer serves to motivate (Maslow, 1943). Quick (1980) defines 'self-actualization' as one's desire to grow to become what one is capable of being, a process in which one's potential is realised.

The Frederick Herzberg's 'two-factor' theory builds on the Maslow's needs hierarchy and makes it specifically applicable to work motivation. The theory suggests that certain job factors called 'motivators contribute to job satisfaction while others called' hygiene factors' frequently account for job dissatisfaction

(Herzberg, 1954). Herzberg contended that when hygiene factors (including company policy and administration, supervision, interpersonal relation, salary, working conditions, personal life, status and job security) are not provided for in a job, then employees will be dissatisfied. However, provision of these factors does not lead to job satisfaction; they are basic and must be satisfied for motivators to work.

According to Herzberg (1954), motivators are associated with job content or intrinsic aspects of the job. These, he states, include achievement, recognition, growth, advancement, responsibility and actual performance of the work itself. The underlying assumption is that, an employee's job satisfaction determines that employee's level of performance to the extent that motivators are effective in motivating the individual to superior performance and effort. Herzberg (1954) briefly concludes that managers' traditional view of 'job satisfaction and dissatisfaction' as two opposite ends of the same continum does not hold. His findings suggest that the opposite of satisfaction is not dissatisfaction but rather no satisfaction.

The process approaches to motivation are concerned with how the individuals are motivated or how work related factors can start the motivational factors. One of the best-respected motivational process theories is perhaps Vroom's (1964) expectancy theory, which is based on the belief that people will normally act to maximize their rewards. The theory holds that motivation is determined by two main factors (i) the belief that efforts will be rewarded and (ii) the value attached to the specific rewards (valance) by individuals. The basic model of the theory is expressed as follows: Motivation = Expectancy x Valance (ie. Motivation is the product of expectancy and valance (Vroom, 1964). The

equation means, the willingness to put in extra effort is actually a product of expectancy (the belief that efforts will be rewarded) and valance one puts on the specific reward.

According to Cherrington and Wixon (1983), Vroom's theory carries the following important implications:

i. employees must believe that expected performance could be achieved,

ii. performance desired by managers must be clearly linked to specific rewards, as failure to reward performance will diminish motivation; and

iii. reward must be meaningful to employees – managers should match employees needs to rewards for maximum motivation. They conclude that employees who believe their efforts lead to performance and anticipate important rewards for their accomplishments become productive and stay productive as the rewards meet their expectations.

A worker will not be motivated to increase performance if the rewards offered are irrelevant to his or her needs (Timpe, 1986). Timpe (1986) suggests that 'managers need to determine what type of outcomes individuals value, or use relatively desired outcomes such as money'.

Adams' equity theory (1965) attempts to explain workers satisfaction with outcomes and predict resulting changes in behaviour. The theory defines motivation in terms of perceived equity between efforts a worker puts into a job and what he receives in return, especially as compared to other workers of similar positions of an organization or a staff in different set-up. Adams' theory holds the following basic principles:

i. perceived inequity creates tension within an individual;

ii. the tension created motivates the individual to restore equity; and

iii. the strength of the resulting behaviour will vary directly with the magnitude of the perceived inequity. Adams indicates that it matters little whether the comparison the worker makes is based on subjective perception or objective reality.

iv. Examples of inputs and outputs under Adams' equity theory are indicated below:

Inputs	Outputs
Efforts	Pay
Experience	Promotion opportunities
Education	Increase Staff

According to Buford and Bedeien (1988), Skinner's (1969) reinforcement theory has a guiding principle which states that 'human behaviour is a function of its consequences'. They indicate that behaviour that results in desirable consequence would likely recur, and those that result in undesirable consequences are less likely to recur.

Analysis and discussion of job motivation in organization primarily focuses on desired behaviour and inadequate performance. Despite their unpleasant connotations, punishment and disciplinary measures are used to eliminate undesired behaviour and poor performance (Kantner, 1986).

McClelland (cited by Kast and Rosenzweig, 1985), the main proponent of achievement theory, suggests that achievers have the following qualities:

i. like situations in which they take personal responsibility for finding solutions to problems;

ii. have tendency to set moderate achievement goals and to take calculated risks; and

iii. want concrete feedback about how well they are doing.

The 'goal-setting theory' is based on the premise that, a person's behaviour is regulated by his goals and intentions. Research by Locke (1968), as cite d by Wextley and Yukl, (1971) provides strong support for the goal motivation theory. The studies indicate that setting specific goals, as opposed to general goals, results in higher productivity. Motivation through goal integration stresses the requirement of commitment to achieving organizational objectives.

Because people are different in their needs and expectations some factors may serve as motivators for one employee but may not motivate another. In the light of these differences, the challenge facing extension administrators is to create a work environment in which many types of motivating factors are available.

2.8.3 Motivation and Employees' Performance

Potter (1987) indicates that how an employee feels about his or her job has an impact on productivity. If the employee feels his or her role is ambiguous or cannot see any future prospects for that position, negative stress or burnout is likely to occur and poor performance will result. Potter defines burnout as a reduction in one's motivation to work; and states 'it begins with small warning signals: feelings of frustration, emotional outburst, withdrawal, health problems, alienation, substandard performance and the increased use of drugs and alcohol'.

Employees work harder and perform better if they are motivated and satisfied with their jobs (Beder, 1990). Cohen (1990) however, notes that staff motivation changes as time and conditions change, and depends on incentives that the staff value and believe to be attainable with increased individual performance.

Watanabe (1991) states that 'motivation, the psychological process that gives purpose, direction and intensity to behaviour, is the main cause of variation in work output that is often observed even among employees with similar skills and abilities. He found out that, being the most important determinant of effective job performance, motivation affected the effectiveness with which AEAs transfer useful development technology to their clients.

The need for extension managers to have an understanding of various theories of motivation as applicable to AEA is stressed by Stoner and Freeman (1992). In Kenya, Alpheous (1996) notes that a district in which agricultural agents described themselves as motivated had a District Agricultural Officer who had received superior rating as a staff motivator. This, he concluded, confirmed that having dependable superiors, (ie persons worthy of being trusted to provide motivational and work related support) was the most important factor related to the motivation of Kenya's Rife-Valley extension agents.

According to Savile (1974), people like to be recognized. The work which they do, should not be taken for granted. They should be told how their work has contributed to the success of an activity. They need more than satisfaction of rendering a useful service. Benor and Baxter (1990) also assert that agricultural extension agents (AEAs) must be recognized by both farmers and Government for the role that they play and the contribution that their work makes to enhance the success of any project. Recognition, Benor and Baxter state, may be formal or informal, tangible or intangible and may be given to the agent by both the extension supervisors, and farmers and other agencies working with the farmers.

For many employees, and especially for AEAs, promotions do not happen often. Some never experience even one in their careers. Smith, Kendall and Hulin

(1969) state that promotion, as a motivational factor, depends on the individuals' perception of the modalities and policies that regulate the exercise of getting workers promoted, and that regular promotion based on the principle of fairness and equity elicits workers commitment to their job. Leonard (1970) notes that in the Vilriga district in Kenya, dissatisfaction among AEAs was widespread as a result of poor prospects for promotion. He also notes that management, making promotion decisions, attempts to match the right person with the job. Taking note of Leonard's study, Lele (1995) suggests that rationalising promotional opportunity and restructuring the supervisory system would seem to be an obvious means of improving staff morale and performance.

In many Government departments, the agricultural extension work has a relatively low public esteem and poor salary structure (Evenson, 1984, Vijayarajaran and Singh, 1997). Vijayarajaran and Singh suggest that extension organizations have to develop a reward system which encourages superior performance so that pay and wage administration will be an effective tool to promote performance, motivation and satisfaction. Costley and Todd (1987) indicate that promotion is desirable since workers need it to raise their social status and get placed in good positions to play higher or additional roles on the job.

A study by Oduro and Kwarteng (1995) revealed that promotions of most extension agents were more related to years of service than individual performance. Consequently, they (AEAs) had little motivation to perform at the optimum.

Cascio (1989) proposes that employees with good skills should be provided skill based salary which is a strong motivating factor for the development of employees self esteem and productivity. The FAO (1993) recommends that AEAs

should have a salary structure as well as promotion opportunity comparable to other professionals like those in health and engineering. Benor and Harrison (1997) state that the low salary levels of AEAs reflect their low status and low productivity and, since they produce little, there is no case for raising their standards of pay.

In their discussion paper, Chambers and Belshaw (1973) point out that unpleasant working conditions and erratic administrative supervision contribute to the sense of frustration among AEAs. Benor and Baxter (1990) note that lower level extension workers often have to work under unpleasant and isolated conditions and recommend that a carefully planned system of field allowance, when put in place, will compensate for this. They state that the working conditions of AEAs need to be improved by providing adequate facilities for housing, transport, medical and educational allowance for their children.

2.9 EXTENSION INFORMATION DELIVERY AND SUPPORT

2.9.1 The Extension Policy

Agricultural extension is one of policy instruments which a government uses to stimulate agricultural development. The agricultural extension delivery and impact in Ghana are constrained by a number of factors such as high cost of agricultural inputs, and inadequate credits to farmers, poor and inadequate rainfall and distribution, inadequate processing and marketing facilities and high incidence of pests and diseases, among others (MOFA, 2003). The question arises as to how extension service can help farmers to respond to these constraints.

The extension policy of MOFA therefore addresses the fundamental issues concerning resource allocation and management processes in agricultural service delivery. The policy of the service is to:

i. be pluralistic, demand-driven and client focused;

ii. promote accountability and be responsive to changing needs;

iii. promote financial accountability;

iv. encourage private sector participation; and

v. be consistent with other government policies, including decentralisation of government functions to District Assemblies (MOFA, 2001).

2.9.2 Guiding Principles of Extension Services Delivery in Ghana

The extension service delivery is guided by a set of principles as enumerated below:

- Extension service as more demand-driven and client focused
- MOFA aims at supporting the development of strategies that promote the accountability of the public sector in providing extension services
- The agricultural extension service in Ghana is to be pluralistic, flexible and responsive to the changing socio-economic environment of the rural sector.
- Extension service delivery to small-scale farmers is to be funded by central government and/or any other interested private organisations including NGOs and must be free-of-charge.
- Public sector funding of the extension service is to aim at establishing a high degree of financial sustainability through enhanced planning and prioritisation of commitments.

- With the decentralisation of government functions to the District Assemblies, the ultimate responsibility for decisions about the nature and level of publicly funded extension service is to be determined by the District Assemblies in consultation with MOFA and other stakeholders.
- The national agricultural extension system is to ensure the provision of adequate extension service to small-scale farmers with special attention to women, the youth and the physically challenged.
- The private sector is to be encouraged to finance and engage in agricultural extension service delivery.
- Agricultural extension service delivery must be cost-effective and consistent with agreed standards.
- Agricultural extension (both public and private) is to ensure accountability to beneficiaries and other stakeholders.
- Agricultural extension should be open to new funding mechanisms
- Human resource development is to be continuous and intensified at all levels
- The extension service is to be more pro-active in developing business and marketing skills of farmers
- Activities of private practitioners who benefit from public funding for extension delivery are to be monitored by the District Assemblies in conjunction with MOFA.
- MOFA and the District Assemblies, are to ensure the quality of services provided by the private sector, (MOFA, 2003).

2.9.3 Strategies of Extension Policy in Ghana

The following are the strategies for achieving extension goals:

i. To ensure the development of different approaches to enhance delivery;

ii. To collaborate with the Department of Co-operatives to promote Farmer-Based Organisations (FBOs) and empower them within the short to medium term;

iii. To operationalize the roles and responsibilities of the various levels of governance (national, regional and district) as defined under the decentralisation process;

iv. To develop a result-based methodology for assessing alternative extension approaches;

v. To increase the efficiency and cost effectiveness of publicly funded extension services;

vi. To ensure relevance of service, linkages among research, extension and farmers;

vi. To promote co-ordination of poverty-reduction focused extension efforts in the areas of gender, education, health and environmental management as they relate to sustainable agricultural production; and

vii. To undertake a broad based Human Resource Development so as to ensure continuous capacity building of staff, (MOFA, 2003).

2.9.4 Formulation of Effective Extension Policy

Wiggins (1988) lists the following for consideration when formulating an effective extension policy:

i. management of extension needs a great deal of attention with better alternatives for staff management;

ii. there is the need to define the role of extension service in terms of the needs of the farmers, the possible results of extension work and the number and quality of staff;

iii. Research should have high priority with specifics to achieve a flow of appropriate recommendations from research stations. The link between extension and research needs to be considered in detail;

iv. Policy needs to be better co-ordinated between aspects like pricing, input supply, marketing and research and extension; and

v. Policy must be easy to implement without discrepancies in the budget system.

2.9.5 Designing Extension Messages

An extension message is useless to a farmer if he does not receive it. Even if he receives it, he must pay attention to it if he is to learn it (Van den Ban, 1986). The farmer may receive an extension bulletin but not read it, or turn on his radio to listen to an extension broadcast but tune in to music instead. The skilled communicator therefore has to design his messages to capture and maintain attention for the duration of his message.

To increase the effectiveness of agricultural extension organization, Van den Ban and Hawkins, (1994) supports the following:

i. Appropriate technology should be available to extend to farmers;

ii. There are effective linkages between extension organizations and agricultural research institutions;

iii. Field level extension personnel have practical training in agricultural technology;

iv. Extension personnel have essential teaching and communication equipment;

v. Extension personnel have frequent access to training in extension methods and communication skills;

vi. Field level extension personnel have adequate transport facilities (ie, mobility) to reach farmers effectively;

vii. Extension personnel do not have many other tasks besides extension work;

viii. Extension personnel possess essential teaching aids, bulletins, demonstration materials etc.

2.9.6 Extension Programme Planning

Programming in agricultural extension imposes three critical functions on programme managers or administrators, namely planning, implementation and evaluation (bin Yahya, 1996). Extension education programmes are planned to effect desirable changes in the behaviour of farmers. Objectives of planning are derived from need assessments of farmers.

2.9.6.1 Needs Assessment

Assessing needs is a critical component of a programme development process since it helps to inform decision-making including planning elements such

as identifying issues and problems, prioritising needs, formulating objectives and determining implementation strategies. There are many procedures that can be used to find the needs of farmers and extension frontline staff (FLS).

Deshler and Wright (1979) outline dimensions of needs that must be considered in ascertaining learner's needs:

i. **Felt Needs** – the educator examines what the individuals within a group to be affected by the programme wish and hope for, and this is done through interviews and/or questionnaire.

ii. **Expressed Needs** – these are needs observed in the types of actual participation in services, and the needs are obtained by studying records and through interviews.

iii. **Normative Needs** – needs assessment based upon statements and opinions of experts and policy makers who hold ideas on what the learners or individuals should have to meet the norms or what a group of similar people have. It uses textbooks, research regulations, etc to measure the needs;

iv. **Comparative Needs** – needs assessment based on observed inequalities in availability of services to different individuals. Needs assessment procedures with indications of how the educator and his learners could use are given by Knox (1986)

v. Obtaining opinions of experts and people in helping roles to identify needs they perceive as widespread among participants; and

vi. Using standards of achievable best practice etc.

Hagan (1992) argues that the planning process should basically require a direct input from peasant farmers, fishermen and animal rearers since they form the bulk of the beneficiaries.

2.9.6.2 The Planning Concept

Meier (1970) recognizes planning as the process which controls the order of a sequence of operations to be performed. Planning requires an explicit set of objectives, but achieving a set of objectives does not necessarily require planning (Mellor, 1966). Sagasti (1979) defines planning in the broadest sense as anticipatory decision making.

Generally, planning is concerned with looking ahead and taking account of future development. Despite the great variety of forms, which it may take, Moshler (1986) states that all planning activities have certain attributes. These include: looking ahead, forecasting, making choices, generating, identifying and evaluating alternatives and, where possible, arranging that future actions for attaining objectives follow some paths or setting limits to the consequences which may arise from such actions.

Planning in agriculture therefore consists of forging tactics or programmes to carry out strategies in order to achieve a desired or set goal over a period. Like Sagasti (1979), Hagan (1992) talks of planning as a process of methodical reasoning involving the systematic identification, collation and correlation of elements that are necessary, or can contribute to the solution of a problem or the realisation of a desired goal. In an important sense, planning, according to Hagan, also derives from cultural modalities and habits of reflection, exchange of ideas and information. This involves the identification of common objectives on the basis of a people's perception of their need and circumstance. Hagan further states

that a plan may be thought of as a framework or rationale that enables needs that cannot be satisfied together to be ordered and placed in a relative time scale that reflects their urgency and casual priority on the basis of accepted values and ends.

Planning is also defined by Lucey (1995) as a managerial process of deciding in advance what is to be done and how it is to be done. It is done on both formal and informal basis, using information from internal and external sources. Lucey (1995) then summarizes planning as decisions by management about:

i what is to be done;

ii. how to do it;

iii. when to do it; and

iv. who is to do it.

2.9.6.3 Why Plan Extension?

In managerial and administrative functions, planning:

i. gathers, translates and communicates information that will help improve the quality of current decisions which are based on future expectations;

ii. plays a central role in management and by helping organizations to succeed. Organizations that plan achieve better results than those, which do not;

iii. provides direction and helps management to focus on both 'felt' and 'analyzed' needs of the plan beneficiaries;

iv. brings rationality and order into an organization and minimizes emergency situations and crisis; and

v. makes easy, the control of extension programmes since control involves correcting deviations from plans (Lucey, 1995).

Planning is therefore, a basic management function; failure to plan may result in random activities that are not directed to defined goals.

2.9.6.4 Problems of Planning

Often, however, planning results from the pressure exerted by donor countries/agencies on recipient countries, as Waterston (1965) observes. This is so because it has become fashionable and because possession of a national development plan often makes it easier to obtain foreign grants and loans. On time-span, Waterston (1965) reports of countries where comprehensive plans have been prepared in a few weeks in an office without the planners having consulted with operating ministries and agencies. Because of unexpected and unpredictable events, especially in agriculture, it is impossible to plan in such a way as to avoid periodic revisions of medium-term plans (Baxter, 1966; FAO 1975).

Mellor (1966) and Baxter (1966) point out that wide geographic dispersion and extremely large number of persons are also problems in agricultural planning. That is agricultural development plans are executed through decision-making units which include a high proportion of the total population of a nation. The geographic area over which farmers are scattered varies greatly with regard to physical, economic, cultural and institutional factors.

According to Baxter (1966) and FAO (1975), agricultural planning is particularly difficult, not because the factors determining demand are largely exogenous to agriculture but also because supply is conditioned by the biological and seasonal nature of agriculture.

Milikan (1976) identifies three major reasons for poor plan performance. These are:

i. Major decisions required for implementation of a plan either do not get made at all or do not get made in time for the plan's targets to be achieved. This situation is due to lack of a timetable for the interrelated and sequential decisions;

ii Unavailability of supply items. These may be physical items like raw materials, equipment or trained manpower or they may be financial items such as credit or foreign exchange; and

iii. Delays in the carrying out of certain activities called for by the plan. Completion times of some activities will be very much more critical to plan implementation.

A plan is a means, not an end. Yet in many countries planners and other officials behave as though completion of the plan formulation is the end, and not the beginning of the planning process (Waterston, 1965).

Under the assumption that technical progress occurs at an exogenously determined rate, and that no effort need be expended to produce it, developing countries rather than carrying out their own research and development activities 'borrow' the existing technology of developed countries. Consequently, as these latter countries advance the state of their technical knowledge, the state of technology available to developing countries changes, as a result of what are to them exogenous factors, and without the input of resources. This results in failures of plans (Waterston 1965). Market limitations also handicap the development of African agriculture (FAO, 1991). The lack of institutions by means of which

ideas, which might crystallize can be put into practice, does not facilitate good plan design and execution.

2.9.7 Implementation of Extension Programmes

This section reviews literature on farmer participation in extension programme planning, implementation, monitoring and evaluation.

Waterston (1965) states that plan formulation should not be divorced from plan implementation. This had been the practice for some time, which led to the failure of some plans. It is also realized that for efficient link, there should be well spelt out institutions for carrying out what aspects of the plan and its organizational measure. He concludes that nothing is more conducive to bad planning than the separation of a plan formulation from provision for follow-up in its implementation.

The way plans are implemented has been identified as one of the major causes of plan failure (Meier, 1970). Meier further states that the record of development planning reveals that problems of implementation need more attention than problems of formulation.

2.9.7.1 Logistical Support

The best personnel can only perform well when the necessary equipment is available and certain material conditions are fulfilled. Albrecht (1989) discusses the following equipment and material conditions which need to be provided, among others, to agricultural extension agents (AEAs) for the efficient performance of extension duties:

i. **Living Quarters and Offices**: It is the wish of extension managers that AEAs live and stay near their target groups to enable them (AEAs) work closely with the farmers. However, this does not always occur.

In many developing countries (especially Africa), Albrecht (1989) intimates that, one of the standard problems of extension organization is the provision of suitable accommodation for the AEAs. Inadequate accommodation can be a real cause of dissatisfaction among the AEAs. Not only does it reduce the quality of their life, but it can also have a detrimental effect on extension work because the question of accommodation takes much of the time in discussions;

ii. **Transport**: The problems of transport, whether motorbikes or bicycles, differ from country to country and region to region. Inadequate transport can seriously impede the work of extension, and the provision of good transport is therefore one of the most basic conditions for the successful running of agricultural development programmes; and

iii. **Extension Aids**: It may be practical to create a special information and media unit within regional projects, if back-up media service does not already exist. Albrecht (1989) indicates that we must always involve communications and media expert in the planning of larger information units.

2.9.7.2 Extension Education Methods

Extension education methods comprise techniques of communication between extension workers and target groups with the aim of motivating and enabling them to find ways of solving their problems (Albrecht, 1989). Depending

on the particular method, communication can be on a mutual basis (e.g. conversation, group discussion) or one-way directed (e.g. information through brochures).

The methods used must be specifically adapted to circumstances, because the use of any communication technique depends on the number of people to be addressed, the problems to be solved and the capacity of the extension service. An extension worker can choose any one or a combination of agricultural extension teaching methods: Individual Extension Methods (IEM), Group Extension Method (GEM) and Mass Extension Method (MEM).

Albrecht (1989) believes that the IEM (eg. field or home visits, office calls etc) alone is not a very effective way of educating the mass of small farmers, but it is the most intensive form of communication between farmers and extension workers. This method plays an important role in complementing group and mass methods.

In group extension work (eg method and result demonstrations, field trips, agricultural shows, etc), several members of the target group, who are linked by formal or informal ties, are addressed at the same time. Among others, GEM has the following advantages:

i. A large number of farmers can be reached;

ii. There are definite time savings compared with the IEM;

iii. Concrete information and develop manipulative skills in the use of new ideas can be passed;

iv. Costs per head of the target group are reduced;

v. Observation of the extension worker's performance is increased;

vi. A large number of small farmers can be advised to promote their interests.

The GEM has the limitations listed below:

a Unless groupings of small farmers already exists, it is difficult to form such groups and keep them functioning;

b. The method requires good planning in selecting and inviting the participants and determining programmes; and

c Compared with IEM, there is a greater chance of conflicts between farmers and extension workers (Albrecht, 1989).

The objective of Mass Extension Method (MEM) is to address a large number of people at once. The people are not in close contact with each other. It is characterized by a one-way flow of information with emphasis on the use of communication aids (eg, radio, television, newspapers, bulletins, leaflets etc). In general, the extension worker uses MEM to create awareness, to generate interest and to get farmers to seek out information (Albrecht, 1989).

2.9.7.3 Theories of Development Participation

The general belief persists that, local participation, and the means of enhancing and nurturing it, are necessary elements in successful development efforts (such as in agricultural development) around the world.

According to Meads (1955) social changes aimed at improving the well-being of a target beneficiary should be introduced with the consent and participation of those whose daily lives will be affected by the change. However, Deshler and Sock (1985) state that the emphasis on participation in decision-making with regard to a development programme is a departure from the traditional notion of planning with the people. In this regard, some authors

describe participation in terms of the 'extent of control of power' by target beneficiary (in this case, the farmer). One of such theories, which address beneficiary participation in social programming, is The Concept of Power.

2.9.7.4 The Concept of Power

This concept describes a ladder of citizen participation that begins with manipulation at the bottom and moves up to citizen control at the top (Arnstein, 1971). According to Arnstein, participation is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic process of social programming to be deliberately included in the future.

The concept of power by Arnstein (1971) is based on the assumption that change in decision making results from confronting existing power sources with a new power centre based on the size and dedication of its group members rather than on the control of wealth or institutions.

Ahmed (1978) observes that in many cases, the political commitment to development is not there. Development means a change and change means a disturbance in the status quo. The ruling class is not prepared to tolerate a drastic disturbance of the status quo. It is prepared to go along with development in so far as it does not impinge upon its power, well being, influence, status control and pre-eminence.

The underlying theme of this theory therefore is that of conflict, that is the have-nots against the affluent or power holders. The conflicts are expected to push the existing powers to negotiate. Deshler and Sock (1985) classify the concept of power in development under conceptual framework into participation Co-operation and Empowerment.

i. The Context of Co-operation

Deshler (1984), notes that co-operation is a characteristic of a dialogical action which occurs only among subjects who may, however, have diverse levels of functions and thus of responsibility. He further states that this can however be achieved through communication. Co-operation between programme planners and the target beneficiary is therefore a crucial factor in determining the success of the programme in any rural development programme.

The underlying assumption of participation in the context of co-operation is that, beneficiaries of any development programme are required to co-operate with planners, administrators and power elite to enable a satisfactory response to beneficiaries' needs and priorities, to provide access to decision-making, and to share the costs and benefits of development equitably (Deshler and Sock, 1985). Authorities in Citizen Participation Theories agree that this approach is a form of genuine participation since it requires at least a minimum of dialogue for programme objectives to be achieved.

ii. The Context of Empowerment

Lele (1995) finds people's participation to be very important for the success of any programme. She reports that local participation may mean involvement in planning, including assessment of local needs. She further states that even if local people do not participate in planning, at the very minimum, they should be informed of the plants designed for their areas if they are expected to consent and to cooperate in programme implementation. Lele concludes by saying that participation in planning and implementation of programmes can develop the self-reliance necessary among rural people for accelerated development.

Lance and Mckeana (1995) also find people participation in programme planning to be essential for programme success. They report that out of fifty development programmes implemented in Northern Nigeria, after evaluation, twenty-nine were found to be partial or total failure; however most of the successful ones had a participation element.

Kindervatter (1979) also describes empowerment in terms of people gaining an understanding of and control over social, economic and/or political forces in order to improve their standing in society. An empowering process to him is a means to bring about such understanding and control. Under this framework, beneficiaries of a social programme are seen as demanding a degree of power or control that guarantees that they can govern a programme or an institution, be in full charge of policy and managerial aspects, and be able to negotiable that conditions under which outsiders "may change them".

Aguaga (1989) describes participation according to the power or control concept as sensitising people and thus increasing the respectivity and ability of rural people to respond to development programmes as well as encouraging local initiatives. Aguaga goes on to say that many Third World leaders decentralized the administration of development programmes in the region as a first step to people's participation, and that the World Bank encouraged decentralization as a pre-condition to its loan disbursement.

2.9.7.5 Farmers' Participation in Agricultural Extension Programmes

Rural farmers are usually the target beneficiaries of any agricultural development programme. Although the farmer occupies a fulcrum of any agricultural development, his input in social programming is almost non-existent. This situation has led to failure of a number of agricultural development programmes. Deshler and Sock, (1985) state that programmes that are designed for farmers without their involvement in the planning stages often lead to such failures. The reason for the failures is that farmers feel less obliged to implement decisions, which have been made on their behalf by external change agents.

2.9.8 Adoption

Adoption of technological innovations in agriculture has for many years attracted considerable attention among development economists because the majority of the population of less developed countries derive their livelihood from agricultural production and income substantially (Feder, 1985).

With the overriding objective of increasing aggregate output in these countries, a primary goal of agricultural development has been to improve the welfare of rural families through enhancing productivity of small farms (Merril-Sands, 1986). Merril-Sands further states that small farmers frequently reject or only partially adopt 'improved' technology. This occurs despite the technology's demonstrated higher levels of productivity on experimental plots, its calculated economic profitability for the farmers, and its beneficial contribution to the larger society. Merril-Sands (1986) describes this problem of limited adoption of introduced technology as the 'technology applications gap'.

2.9.8.1 Definition of Adoption

The process by which a farmer is supposed to consider and reject or accept to practise a particular innovation is referred to as adoption of an innovation (Moshler, 1986). To Adams (1965) adoption is a process, which involves the decision to make full use of an innovation as the best course of action available.

Rogers (1983) also looked at adoption as a process and proposed its sequence as knowledge, persuasion, decision and implementation. Thus, the individual must first learn of the existence of the innovation and understand its function. Persuasion, which is the formation of favourable or unfavourable attitude towards an innovation by the decision-maker, must occur in the process of adoption. This is followed by a period when the individual engages in activities that lead to decision on whether to partially or totally adopt. Implementation occurs when the individual, having developed a favourable attitude towards the innovation, puts it to use.

2.9.8.2 Adoption Characteristics

It has been observed that adoption behaviour tends to be specific to particular innovations, individuals, and environment (Leagans, 1979). The first is that adoption is unique to each individual and environmental influences. The second is that farmers must know what the idea is, why and how they should incorporate it in their farming. The third is that socio-demographic characteristics such as age, income, education and family size influence adoption indirectly. The last characteristics are socio-psychological factors.

On the basis of the above, Leagans (1979) came out with the following:

i. adoption of simple innovations is made at much higher rates than complex practices;

ii. dissemination of technical information is an easier task if it is compared with achieving final act required to terminate the adoption act;

iii. Adoption behaviour requires a favourable mental state and a successful physical act;

iv. Optimum adoption of innovations is achieved only when a farmer perceives the recommended practices physically possible and socially acceptable;

v. Adoption behaviour at optimum levels depends on technical, physical, economic, social, educational and political act that establishes and maintains a macro and micro environment which is favourable to farmers to translate their behavioural influences into action.

Leagans (1979) concludes that adoption behaviour is attained through a series of mental workouts involving reasons favourable to non-action or maintaining the status quo.

2.9.8.3 Categories of Adoption

Rogers (1983) categorizes adopters with respect to the time they take to adopt innovations. These are innovators, who usually take risk and are the first to adopt new ideas. This group forms about 2.5%. After this group, the next to adopt is the early adopters who are also about 13.5%; followed by the early majority, 34.0%, late majority (34.0%) and lastly, the laggards who are often reluctant to adopt. This last group is usually conservative and always wants to play it safe.

They form 16.0%. Age and gender may determine a farmer's command over labour, land, credit or information about the technology and other factors which influence adoption. An innovation may be adopted more by men than by women or vice versa (CIMMYT, 1993).

2.9.8.4 Technological Characteristics

Bryerlee and Hesse de Palaco (1982), relates adoption technological components to the characteristics of the technology itself, and demonstrated that farmers followed a stepwise approach to adoption of a package that reflects the characteristics of each component and the interaction between them. These characteristics are: profitability, riskiness, divisibility, complexity, and availability of necessary inputs. Byerlee and Hesse de Polaco (1982) also report that most adoption studies had a 'pro-innovation' bias that assumes that the innovation is 'right'. Therefore they analysed patterns of adoption in terms of different socio-economic characteristics of farmers.

Rogers (1983) also lists five similar characteristics from the farmer's point of view which affect their adoption as follows:

i. Relative advantage
ii. Compatibility
iii. Complexity
iv. Trialability
v. Observability

Relative Advantage:

This is the degree to which an innovation is regarded as better than the idea or object it is intended to replace. The acceptance of an innovation is thus in relation to economic gains, social prestige factors, satisfaction and convenience associated with it. Adams (1990) puts it that sometimes the relative advantage of an innovation is enhanced by reducing its cost and also by subsidies.

Farmers are astute economists and will not readily adopt technology which appears to have some pecuniary risks. The more tangible the benefits of an innovation, the more farmers may be willing to adopt. For example, farmers may take up a new variety of cocoa offering them higher yields more rapidly than one which they perceive as low yielding.

Compatibility

It is the degree of consistency of the package with the farmer's value, management objectives, the level of technology and the stage of farm development (Adams, 1990). In a guide for survey design, prepared by CIMMYT (1993), questions of compatibility with ethnic, religious and community factors are usually asked to find out compatibility of programmes. Farm size, availability of equipment and machinery are some factors that determine the compatibility of an innovation.

Complexity

This is the degree to which an innovation is understood and can be used by farmers (Rogers, 1983). According to Rogers, some innovations are readily understood by most members of a social system, others are more complicated and

will be adopted more slowly. Education may make a farmer more able to deal with technical recommendations that require some level of literacy. Thus, if a technology is found to be more accepted by the educated folk, then the result can be used as a case for more investment in the extension services to the uneducated fold to simplify the technology (CIMMYT, 1993). It therefore follows that, the more complex an innovation is, the more difficult it is for farmers to adopt (all other things being equal).

Trialability

A farmer will be more inclined to adopt an innovation which he has tried first on a small scale on his own farm and which proved to work better than an innovation he had to adopt immediately on a large scale which involves great risk.

Observability

It is the degree to which the results of an innovation are visible to farmers (Adams, 1990). Farmers are more inclined to adopt an innovation after seeing its results than when results are not easily seen.

2.9.8.5 Adoption-Diffusion Process

In Western Nigeria, Basu (1969) assesses the relationships between farmers' attitudes and their adoption behaviours. He finds that farmers' farm size, extension contacts, participation in organization (training), land tenure, status and occupation have relationship with adoption whilst age, education, use of mass media, farming experience and socio-economic status were not.

Ogunfiditimia (1981) uses partial correlation coefficient to study the relationship between selected socio-economic variables and adoption of improved maize and cocoa varieties in Oyo and Ondo States of Nigeria. Out of all the ten socio-economic variables tested (education, age, economic status, farm size, leadership role, perceived risk and uncertainty of adoption of new practices, contemporary influences, conformity of the new practice with community norms, family decision in relation to the new practice and credibility of extension agent in relation to the new practice) only age did not significantly influence farmers' adoption of improved maize and cocoa varieties.

Wake (1982) states that rural people seek information from each other, and recommends the use of communication methods which capitalize on it. He cautions about assuming a high credibility of extension sources of information. Wake further recommends that because of extension's low credibility, there is need to increase dialogue with farmers and build on the tendency of rural people to seek information from each other. This dialogue is necessary to develop a change in attitude and to provide information to assist decision-making and translate knowledge into action.

Diffusion research empirically demonstrates that new ideas, once introduced into a social system, spread in that social system from one decision-making unit (individuals, households, collectives) to the next over time. Diffusion is shown to be a process which can take place in social systems quite autonomously, irrespective of any intervention (Rogers, 1983). Rogers finds out that time is an important element in diffusion and adoption of an innovation and that adoption is a mental process on the part of an individual over a period of time.

A study by Hailu's (1990) on household characteristics and input supply factors affecting the adoption level of improved farm practices in small holder agriculture in the Northern Ghana, shows that education, farm size, family labour and extension contacts determine the adoption and use of new innovations in agriculture.

2.9.9 Monitoring and Evaluation

Monitoring and evaluation are closely related and can overlap. In practice, the terms are often used loosely; even interchangeably. However, they are two distinct functions.

2.9.9.1 Definition of Monitoring and Evaluation

Appiah and Kannae (1988) define monitoring as an internal programme or project activity and calls for diagnostic studies as part of its function of aiding management decision-making. It is a continuous assessment of implementation of a programme to ensure that input deliveries, work schedules, target outputs, and cost estimates are being met, and whether initial/estimated effects are being felt by the beneficiaries or target group(s). Monitoring may imply watching, observing, tracking, and documenting programme implementation in order to ensure compliance to programme plan.

Appiah and Kannae (1988) state, however, that evaluation makes judgements on efficiency, effectiveness, relevance and impact of programme outputs in contributing to solving the development problem for which it was formulated. According to Collins (2000), monitoring is to make a continuous observation and check on a programme. Monitoring, Collins states involved

keeping an eye on the programme to ensure that input deliveries, work schedules, cost estimates etc, are being met. Collins (2000) however, defines evaluation as an appraisal or assessment of the programme to decide on how good or valuable the programme is after thinking carefully and forming an idea about it.

2.9.9.2 Purpose and Use of Evaluation

Appiah and Kannae (1988) list some uses of effective evaluation. The evaluation:

i. helps improve the management of programmes and related activities, and point to better usage of funds and other resources;

ii. helps people to learn from experience so as to improve the relevance, methods, and results of programmes, for current and future work;

iii. improves public accountability by demonstrating that resources have been used effectively;

iv. provides information to enhance communications within programmes and organizations; and between different stakeholders, and also for advocacy work;

v. helps in decision making, focusing on where action should be taken, where training or specialist help is needed or where further research would be helpful;

vi. improves planning by providing information about past performance and influence about past performance and influence policy-making; and

vii. provides information for fund raising and advocacy.

2.9.10 The Research –Extension Linkage

2.9.10.1 The Agricultural Research Set-up in Ghana

Most of the agricultural research done in Ghana is undertaken by the Council for Scientific and Industrial Research (CSIR) of the Ministry of Environment and Science (MEST) which was established in 1968 to promote and co-ordinate research efforts of the different ministries and departments (MOFA, 2003). The research is carried out by seven semi-autonomous institutes with specialisation in crops, soils, animals, oil palm, aquatic biology and food. Cocoa research is however undertaken by the Cocoa Research Institute under the management of the Ghana Cocoa Board (COCOBOD). The Technical Departments of MOFA, (crops, livestock and fisheries) also carry out some adaptive trails with or without the collaboration of the research institutes of CSIR. The Faculties of Agriculture in the Universities of Cape Coast, Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi and the University of Ghana, Legon, also conduct research, focused on differing agro-ecological zones (Doamekpor, 1997).

2.9.10.2 Research-Extension Linkage Committee and Farmer Relations

The National Agricultural Research Project (NARP) was launched under the Medium Term Agricultural Development Project (MTADP) in 1991 to improve upon the institutional arrangements that govern agricultural research, to ensure that priorities reflect national agricultural development objectives, and that research would be made responsive to the constraints experienced by farmers (MOFA, 2003). Through the implementation of the National Agricultural Extension Project (NAEP) and the National Agricultural Research Project (NARP)

a close working relationship was forged between research and extension through the formation of the Research-Extension Linkage Committee (RELC) (MOFA, 2001).

The RELC, which is made up of researchers, managers of regional research centres, subject matter specialists (SMS), Regional Development Officers, Regional Agricultural Extension Officers and representatives of farmers, functions to review and assess the performance of the various organizations involved in technology development and delivery in the region (MOFA, 2003). It also aims primarily to link closely, research and extension to support the technical activities of farmers. The overall objective of the RELC is to ensure that agricultural research in the country is farmer-driven and that extension carries relevant and well proven messages.

To achieve its objectives, the RELC provides a forum for the various players in the promotion of agricultural productivity and production in the zone, and also supervises and advises on their activities. Mechanisms put in place to ensure an effective research-extension linkage include the following:

i. technical review meetings are attended by research, technical or SMS departments of MOFA and DAES. At such meetings, SMS are introduced to new technologies from research, specific technologies are evaluated based on field experiences, farmers problems are discussed and solutions sought for them;

ii. various stages of technology development and delivery in which researchers, SMS, extension staff and farmers take part. These include adaptive trials on the regional research stations, on-farm trials carried out

by SMSs and extension staff in collaboration with farmers and small plots demonstrations on specific technologies by farmers and AEAs; and

iii. co-ordination of research and extension activities at the regional level by the RELC (MOFA, 2003).

2.9.10.3 Impact of Research-Extension Linkages on Technology Transfer

Many authors advocate for ways of strengthening research-extension linkage to enhance technology transfer (Byerlee and Tripp, 1988). Horton (1986) states that the lack of good communication between research and extension has particularly limited the transfer of technologies other than to improve crop varieties, such as storage and pest management.

In most developing countries, agricultural research and extension are separate public institutions with different mandates and different organisational structures and operational procedures. Lack of effective links between research and extension institutions has impeded the development and transfer of technology appropriate for small-scale, resource poor farmers, particularly those in low-potential, heterogeneous agro-ecological areas. These farmers, according to Ewell (1988), have no effect on organisations through which to make their needs known. Researchers do not receive enough information about these farmers' conditions and resources to set relevant priorities and goals. At the same time, local extension agents do not receive the information and co-operation they need to first adapt and then diffuse appropriate technology.

Doamekpor (1997) assessed the impact of research-extension-farmer linkages on technology transfer to farmers in the Volta Region in Ghana. He found

that the mechanisms that fostered effective link between farmers, AEAs and researchers were personal contacts, RELC's monthly training sessions, monitoring tours or farm visits, monthly meetings with DDAs and farmer groups. He indicated that research-extension-farmer linkages were low and very low for AEAs. Perceived problems which hindered research-extension-farmer linkages were differences in policy directives because research and extension are under separate ministries, inadequate funds for logistics to enhance research-extension activities, and high cost of agricultural inputs, which made it difficult for farmers to use technologies or adopt technology packages. The activities which closely brought researchers, AEAs and farmers together included attendance at Farmers' Day celebrations, mini demonstrations, on-farm trials and joint problem diagnosis of farmers' situation.

2.10 Effectiveness of Agricultural Extension Delivery.

The efficiency and effectiveness of extension educators will be enhanced if the best delivery systems are used. As communities and clientele change and budgets become tighter, knowledge of system effectiveness becomes increasingly important (Whiteside, 2002).

2.10.1 Demographic Characteristics of Farmers, AEAs and Selected Abilities.

In a study of effectiveness of extension agents in Bendel State of Nigeria with respect to selected abilities, Obinne (1992) observes that there were more males than females respondents. However, Obinne states that in a culture where interaction between males and females is restricted, it was not good that most of the agents were men.

Obinne (1992) further observes that projects should ensure regular availability of farm infrastructural facilities; and government should subsidize costs of agricultural inputs. The results also revealed that facilities were glossy inadequate. Forty-seven percent and forty-four percent of the AEAs rated themselves low in the subject matter of agriculture and in their teaching competence respectively.

2.10.2 The Research –Extension –Farmers' Linkage.

To facilitate both research and extension, there should be a close collaboration between researchers, extension agents and farmers in the design, conduct and application of research in agriculture (Black, Forge and Fionnuala, 2000). They conclude that researchers should investigate the impact of the technologies they develop; and the extension personnel should not be satisfied with their job once the technologies have been disseminated to the farmers. They should undertake frequent follow ups to enhance the rate of adoption of the technologies. A good communication between research and extension enhances technology transfer (Byerlee and Tripp, 1988 and Horton, 1986).

According to Ewell (1988), lack of effective links between research and extension institutions impede the development and transfer of technology appropriate for small-scale, resource-poor farmers, particularly those in low-potential, heterogeneous, agro-ecological areas. Researchers in those areas do not receive enough information about farmers' conditions and resources to set relevant priorities and goals.

2.10.3 Credit Facility for Farmers.

The most critical factor in Ghanaian rural farming situation is credit (Owusu Acheampong, 1986). With credit, the farmer can increase his productivity which in turn would ensure greater farm inputs and increased income. For some programmes, credit has to be made an integral part to cover inputs supply, marketing, processing, and storage to be effective and successful.

2.10.4 Development and Characteristics of Technologies.

In agricultural extension, farmers are mainly seen as the recipients of technical messages but not as originators of either the technical knowledge or improved practices (Moris, 1991). According to Martin (1990), during the process of technology development, farmers' innovations are not considered while conducting on-farm trials. Some technical messages do not reflect local production conditions. The agricultural researchers and extensionists usually are not aware of local classification system of farmers regarding soils, crops, livestock and other natural resources (IFAP, 1990). Blanket recommendations of technical messages, which are evolved from research, are sometimes made and cannot be adapted to heterogeneous farming conditions (IFAP, 1990).

Whiteside (2002) also reports that extension designed to support sustainable smallholder agriculture will need to respond more to local circumstances. There will need to be affirmative actions to make sure the poorest and women farmers are reached. For extension to be effective and increase the rate of adoption, it should directly increase awareness, help producers acquire skills, help them understand a technology and its relevance to their circumstances (Gerson, Willette and Zijp, 2003).

For extension delivery to be effective, researchers and extensionists need to consider farmers' innovations while conducting on-farm trials. Technologies should reflect local production conditions and the researchers and extensionists should be guided by the compatibility and simplicity of application of the recommended practices by farmers. The practices should have relative advantages which should be noticeable by farmers.

2.10.5 Competence and Motivation of AEAs.

In the recruitment and professional development of extension agents, attention should be given to the need for competence in technical and economic aspects of agriculture and for skills in communication, teamwork and group facilitation, together with a good understanding of adult leaning principles, rural communities, and programme planning and evaluation (Black, Forge and Fionnuala, 2000). To improve extension agents' performance, in-service training is urgently needed. A higher level of training and skills is needed if extension staff are to collaborate effectively with farmers in applying technical knowledge (Olson and Fruin, 1979).

Odugbesan (1985) examines motivating factors and level of job satisfaction of workers in large- scale private agricultural farms in Ogun State in Nigeria. According to Odugbesan, high remuneration, promotion, good pension scheme, job security and recognition of staff were rated as very important motivating factors. The researcher (Odugbesan) suggests that there should be the need to improve organizational effectiveness by improving reward system and involving employees in decision-making process.

2.10.6 Extension Education Methods

Throughout history, extension has relied heavily on result demonstrations to disseminate information. From the first result demonstration in 1903 until present time, the demonstration method of teaching has proved time and time again to be invaluable in transferring knowledge to the intended audience (Boyle 1981). Other early forms of extension teaching methods that are still valuable are seminars, group discussions, correspondence instruction, telephone conversation and farms visits. Houghton, Arrington and Bradshaw (1994) advocate that extension workers must become skilled in a wide variety of teaching methods, so they can select the best single one or a combination of several methods that will get across a particular message to an individual or a group in the most efficient and effective manner possible.

2.11. The Theoretical Framework of the Effectiveness of Agricultural Extension Delivery (EOAED).

To make extension delivery effective, there should be a close collaboration between researchers, extension agents and farmers in the design, conduct and application of research in agriculture. Researchers should investigate the impact of the technologies they develop and extensionists should undertake frequent follow ups to enhance the rate of adoption of the technologies by farmers. There should be a continuous feedback from the farmers to the researchers and extensionists regarding the characteristics of the introduced technologies. Lack of effective links between research and extension institutions impede the development and transfer of technology appropriate for small-scale and resource-poor farmers.

In agricultural extension, farmers are mainly seen as the recipient of technical messages but not as originators of either the technical knowledge or improved practices. Some technical messages do not reflect local production conditions. It can therefore be conceptualized that during the process of technology development, farmers' innovations need to be considered by researchers and extensionists while conducting on-farm trials.

The technology or innovation should be as such that the innovation is regarded as better than the idea or object it intends to replace since the acceptance of an innovation in relation to economic gains, social prestige factors, satisfaction and convenience is paramount. The more tangible the benefits of an innovation, the more farmers may be willing to adopt. The compatibility, trialability and observability of recommended practices are all important to adoption and affect EOAED.

The extension education methods used to educate farmers aim at motivating the farmers to enable them find ways of solving their problems. The methods used must be specifically adapted to circumstances because the use of any communication technique depends on the number of people to be addressed, the problems to be solved and the capacity of the extension service. It is believed that the use of only one extension method is not a very effective way of educating farmers.

It therefore follows and can be conceptualized that extension workers must become skilled in a wide variety of teaching methods, so they can select the best single one or a combination of several methods that will get across a particular message to an individual or a group in the most efficient and effective manner possible.

It can also be conceptualized that the sex of an extension agent affects the EOAED. In a culture where interaction between males and females is restricted as in Nigeria, it is not good that most of the extension agents should be men. The extension agents would be freer to interact with the female farmers if there were more female agents to enhance effectiveness. The literature also revealed that it is wrong to assume that an effective development programme for males will automatically translate into an effective programme for women, as well.

The effects of the extension work depend, to a larger extent, on the professional competence of the extension agents. It can therefore be conceptualized that when an extension personnel has low level of competence, some extension programmes do not produce benefits sufficient to justify their costs.

To improve extension agents' performance, there is the need for a regular and continuous training of the agents to upgrade and update their professional skills. The agents must be kept in close touch with relevant scientific developments and research in order to formulate specific recommendations that will be useful to the farmers in all kinds of resource situations. A higher level of training and skills is needed to enable the extension agents collaborate effectively with farmers in applying technical knowledge.

The literature also revealed that managers must ensure the quality of their extension staff; and one of the ways is by motivation to enable the staff work harder. High remuneration, promotion, good pension scheme, job security and recognition of staff are rated as very important motivating factors. There is therefore the need to improve organizational effectiveness by improving reward system and involving employees in decision-making process to enhance EOAED.

It can also be conceptualized that the best personnel can only perform well when the necessary equipment is available and certain conditions are fulfilled. When living quarters, transport and extension aid, among others, are provided, to an extension agent, the agent would perform well and effectively.

From the literature, it can also be conceptualized that some characteristics of farmers have influence on the farmers' performance. Health and declining age of farmers have a positive relationship between age and the work a farmer can do. The extension delivery may be ineffective because the older farmers are less able to apply recommended practices, especially the heavy tasks.

Furthermore, the level of education of the farmer, to some extent, determines the type of task the farmer can undertake in any programme, and therefore the type and level of participation. Education of the farmer, therefore affects the farmer's ability to decode information about new technology and prices of inputs, and how to relate this to farming operations. A farmer with a higher level of education is expected to be able to participate in more extension activities than one with a lower level of education. The education of the farmer therefore affects the EOAED.

The literature also revealed that the most critical factor in the Ghanaian rural farming situation is credit. With credit, unproductive traditional farming can be transformed into modern techniques of farming, utilising more sophisticated equipment and other sensitive inputs (such as fertilizers, improved seeds) recommended by extension agents to help farmers increase productivity of farms and outputs. For some extension programmes, credit will have to be made an integral part to cover inputs supply, marketing, processing and storage to be effective and successful.

In this study, therefore, the theoretical framework is based on deduced relationships as outlined above and presented in Fig. 2. The figure shows that the research- extension and farmer linkage, characteristics of technologies, and extension education methods have effects on the EOAED. The sex, professional competence, motivation and logistical supports for AEAs also have relationships with and affect the EOAED. Furthermore, the age, the level of education and credit facility for farmers have influence, relationships with and affect the EOAED. The aforementioned factors in Figure 2, among others, would be examined to find out whether they would affect the effectiveness of agricultural extension delivery in the Ashanti region.

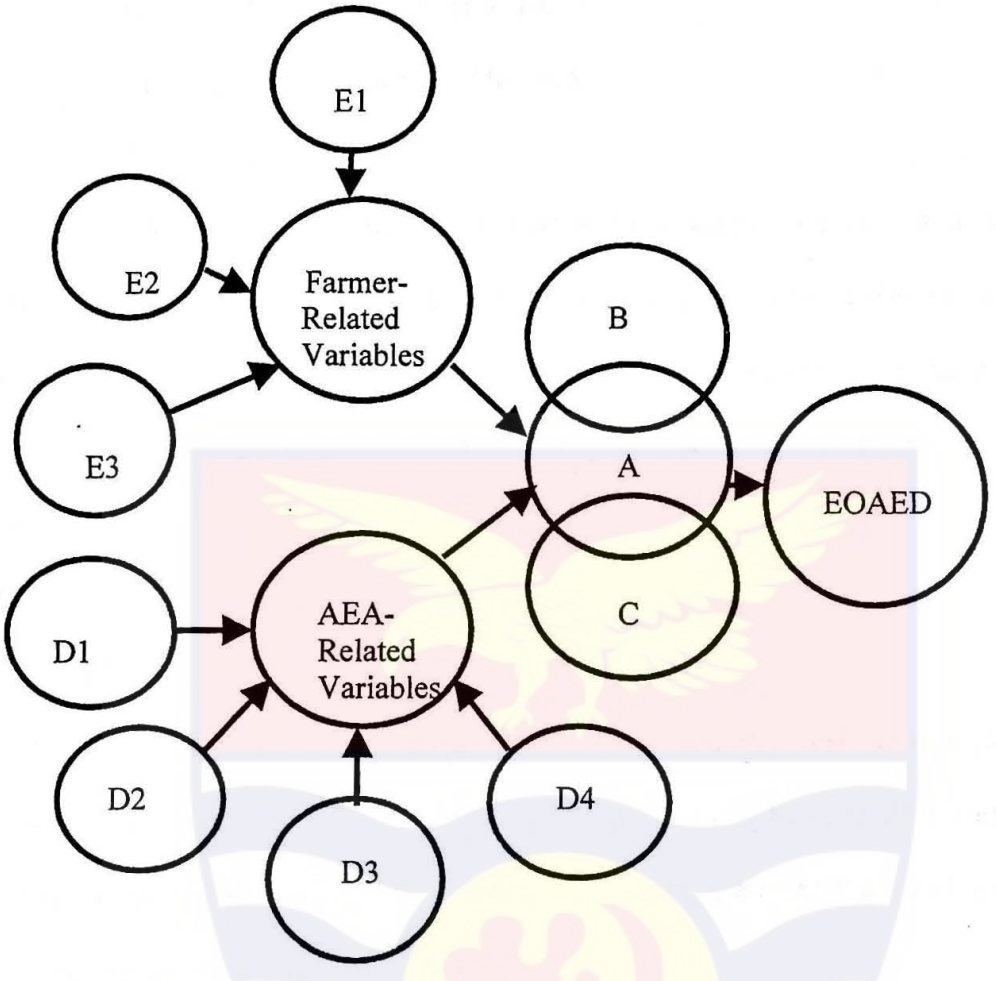

FIG. 2: THEORETICAL FRAMEWORK OF THE EFFECTIVENESS OF AGRICULTURAL EXTENSION DELIVERY (EOAED)

KEY

Research Variables	**AEA-Related Variables**	**Farmer-Related Variables**
A: Research-Extension-Farmer Linkage	D1: Sex	E1: Age
B:Technological Characteristics	D2: Professional Competence and Training	E2: Educational Level
C: Extension Methods	D3: Motivation	E3: Credit Facility
	D4: Logistical Support	

Source: Author's construct

CHAPTER THREE

METHODOLOGY

This chapter presents methods that were used to investigate factors that affect the effectiveness of agricultural extension delivery in the Ashanti Region of Ghana. It covers the research design, the population, sampling method, instrumentation, the research area, data collection procedure, data processing and analysis.

3.1 RESEARCH DESIGN

A descriptive-correlational design, using questionnaires and structured interviews, was employed. This design is appropriate for collecting data and describing the nature, strength and direction of relationships among the variables of the study, (Fraenkel and Wallen, 1990).

3.2 THE STUDY POPULATION

The main populations for the study were farmers and agricultural extension agents (AEAs) of the Ministry of Agricultural (MOFA) in the Ashanti Region. However, views were also sought from the Regional Director of Agriculture (RDA), District Directors of Agriculture (DDAs) and District Development Officers (DDOs) of the MOFA in respect of some variables of the study.

3.3 SAMPLING PROCEDURES

Five Districts (Atwima, Ahafo-Ano North, Sekyere West, Asante Akim North and Adansi East) of the MOFA were randomly selected for the main study, using the lottery method.

With the lottery method, the names of all the eighteen agricultural districts in the Ashanti Region were written on pieces of paper and folded individually. All the folded papers were put in a box. Six persons were asked to pick the folded papers. The names of the first five districts picked were selected for the main study. The sixth pick was used for pre-testing the questionnaires.

A list of AEAs and another list on farmers were compiled with the help of the DDAs in the districts. There were 90 AEAs in all the districts distributed as follows:

District	**Number**
Atwima	19
Asante Akim North	18
Sekyere West	19
Adansi East	18
Ahafo Ano North	16

All the AEAs in each of the five districts were included in the study. A total of 175 farmers (35 farmers for each district) were randomly selected for the structured interviews. Views were also sought from the five DDAs and twenty DDOs (four DDOs for each district) of the MOFA in respect of some variables of the study.

3.4 INSTRUMENTATION

Questionnaire and structured interview schedule were developed for the AEAs and the farmers respectively after an intensive review of the literature on the objectives of the study. Open-ended and closed-ended questions were used in the questionnaire and the structured interview schedule to collect data for the study.

The structured interview schedule was used to collect the data from farmers on their demographic characteristics, sources of capital for agro-enterprises, access of farmers to labour, financial credits, types and sizes of farms. Data were also collected on the contacts of farmers with extension agents; extent of farmer involvement in extension programme planning and implementation as well as perceptions of farmers of problems associated with agricultural extension delivery in the Ashanti Region (Appendix 2).

The questionnaire was used to collect background information of agricultural extension agents (AEAs). The questions covered their demographic characteristics, AEAs' perceived professional competence, motivation, logistical supports, their participation in extension programme planning and implementation. Constraints which hinder their performance and AEAs' perceived problems associated with extension delivery in the Region were also collected (Appendix 3).

Questionnaires were also designed to collect data from the District Development Officers, District Directors of Agriculture and Regional Director of Agriculture in the study area for cross-validation. The variables included extension policy of the MOFA, professional competence, motivation and logistical supports for the AEAs, extension programme planning, implementation, monitoring and evaluation and problems associated with agricultural extension delivery in the Ashanti Region (Appendices 4, 5 and 6)

Experts in the field of agricultural extension, social sciences and rural sociology from the University of Cape Coast (UCC), determined the content validity of the instruments.

The pre-testing of the questionnaires was conducted between October and November, 2002, using 20 AEAs, 6 DD0s and 20 farmers in Juaben-Ejisu District in the Ashanti Region. The purpose of the pre-testing was to ensure the internal consistency of the instrument. An overall Cronbach's alpha reliability co-efficients of 0.78 and 0.86 were obtained for farmers' and AEAs' instruments, respectively. The results were used to improve the questionnaires and the structured interview schedule.

3.5 DATA COLLECTION

The written, validated and the pre-tested questionnaires were administered to the extension staff and the structured interviews conducted with farmers between January and February, 2003 for the data collection. This was done by the researcher and two trained assistants. Two follow-ups were made to gather the data from the AEAs and the farmers.

By the end of February, 2003, all the completed questionnaires had been received from the AEAs. However, out of a sample of 175 farmers, 166 responded to the structured interviews, giving a response rate of 94.9%.

3.6 DATA PROCESSING AND ANALYSIS

The returned questionnaires and the structured interview schedule were checked for completeness and accuracy. The data were then organised and subjected to statistical analysis, using the Statistical Package for Social Sciences

(SPSS) computer software available at the Department of Agricultural Economics and Extension Computer Centre, University of Cape Coast. Below are the techniques used to analyze the data:

3.6.1 Selected Demographic Characteristics

To help describe the demographic characteristics of the farmers and AEAs, descriptive statistics, involving measures of central tendencies (range, means, mode and standard deviation), frequency distribution and corresponding percentages, were computed.

3.6.2 Examination of Agro-Enterprises of Farmers

To describe farmers' modes of land acquisition (family land, purchased land and leasehold), farms sizes, sources and availability of labour to farmers, frequencies and percentage distributions were computed from respondents' responses.

Frequencies and percentage distributions were also computed for farmers' access to financial credit. Farmers' perceptions of access to credit as well as of profitability of recommended technologies were assessed by computing means and standard deviations.

3.6.3 Professional Competencies of AEAs

The data obtained from a four-point Likert scale (4 = High, 3 = Fair, 2 = Low, 1 = Very low) were analysed by computing means and standard deviations from AEAs responses. Means and standard deviations were also calculated from a

five-point Likert scale (5 = Very good, 4 = Good, 3 = Fair, 2= Poor, 1 =Very poor) for DDOs' appraisal of AEAs' performance.

3.6.4 Motivation of AEAs

To determine AEAs' perceived levels of motivation and other independent variables such as supervision, job satisfaction, recognition, involvement in goal-setting, salaries and working conditions, promotion etc, means and standard deviations of responses were computed from scores on a five-point Likert scale (5 = Very high, 4 = High, 3 = Fairly high, 2 = Low and 1 = Very low).

3.6.5 Extension Information Delivery and Support

Frequencies and percentage distributions of responses were calculated. Means and standard deviations were also computed to determine the RDA, DDAs and DDOs' responses of effectiveness of MOFA extension policy. A five-point Likert Scale used was: 5 = Very effective, 4 = Effective, 3 = Fairly effective, 2 = Less effective, 1 = Least effective.

Further, the RD, DDAs, DDOs and AEAs' perceptions of extension programmes funding were ascertained, using a five-point Likert scale (5 = Very adequate, 4 = Adequate, 3 = Moderately adequate, 2 = Inadequate, 1 = very inadequate). A five-point Likert scale was also developed to determine timeliness for release of funds for extension programmes delivery. The scale was 5 = Very timely, 4 = Timely, 3 = Somewhat timely, 2 = Untimely 1 = Very untimely.

With the responses of DDAs, DDOs, AEAs and farmers from a five-point Likert Scale (5 = Very high, 4 = High, 3 = Occasionally 2 = Low and 1 = Very low), frequencies and percentage distributions were computed to describe their

participation/involvement in extension programme planning, implementation, monitoring and evaluation. Means and standard deviations were also calculated to determine AEAs and farmers' extent of involvement in extension programmes.

Means and standard deviations were computed to determine DDAs, DDOs and AEAs' perceptions of extension logistical support.

To determine farmers' contact with Extension/AEAs, frequency and percentage distributions of monthly visits to farmers by AEAs were calculated. Frequencies and percentage distributions of responses from DDAs' and DDOs' perception of linkages between districts and research institutes were computed. Farmers' perceptions of Research-Extension-Farmers (REF) linkages, frequencies and percentages were examined with frequencies and percentages. Data on farmers' perceptions of the effectiveness of extension education methods were analyzed, using data from a five-point Likert scale (5 = Very effective, 4 = Effective, 3 = Somewhat effective, 2 = Ineffective and 1 = Very ineffective). Means and standard deviations were computed.

3.6.6 Extension Staff and Farmers' Perceptions Of Effectiveness of Agricultural Extension Delivery (EOAED).

The following five-point Likert scale was used to enable the researcher compute means and standard deviations from responses : 5 = Very effective, 4 = Effective, 3 = Moderate, 2 = Less effective, 1 = Least effective. An F-test of significance (ANOVA) was also computed at 0.05 alpha level.

3.6.7 Extension Staff and Farmers' Perceptions of Problems Associated with Extension Delivery in the Ashanti Region and Relationships between the EOAED and the Independent Variables of the Study.

Frequency and percentage distributions of responses from respondents were computed. To determine the relationships between the EOAED and the independent variables of the study, the Pearson product-moment correlational analysis were done. The results of the correlational analyses were used for multiple regression analysis to determine the best predictors of the EOAED in the region.

CHAPTER FOUR

RESULTS AND DISCUSSION

The results are presented and discussed in this chapter, based on the objectives of the study.

4.1 DEMOGRAPHIC CHARACTERISTICS OF FARMERS AND THEIR RELATIONSHIPS WITH THE EFFECTIVENESS OF AGRICULTURAL EXTENSION DELIVERY (EOAED)

4.1.1 Sex of Farmers

The findings revealed that there were more male respondents than females in the study area. The percentages of farmers who responded were 81.1% males and 18.9% females (Table 1).

Table 1: Sex Distribution of Farmers

Sex	Frequency	Percent
Male	133	81.1
Female	31	18.9
Total	164	100.0

Source: Field Data, 2003.

Generally, farming is a laborious, labour and capital intensive venture and very challenging from the establishment of the farms to the marketing of the farm produce.

It has been observed by Roberts (1986) that the long standing emphasis of women's domestic chores has always masked their visible participation in the area of production. At home, the women rear the children; they tidy up the homes; they cook food; they wash clothes; and they fetch water for the households.

Women would also assist their husbands to establish and maintain farms by weeding, hoeing and fetching water for spraying pesticides and fungicides to control pests and diseases on crops. It is an acceptable fact that some women establish their own farms or inherit farms bequeathed to them by their husbands or relatives but they do not out-number the male farmers. Based on the roles played by women in the area, it was not surprising that there were more male respondents than the females.

4.1.2 Age of Farmers

Age distribution of the respondents is presented in Table 2. Their ages ranged from 27 to 85 years with a mean age of 55.8 years. Bi-modal ages were 48 and 65 years. Majority (61.6%) of the respondents were above 50 years. Only one farmer was below 30 years.

Table 2. Age Distribution of Farmers

Age (Years)	Frequency	Percent	Cumulative %
Below 30	1	0.6	0.6
30 – 40	18	10.8	11.4
41 – 50	45	27.2	38.4
51 – 60	44	26.5	65.1
61 – 70	37	22.2	87.3
71 – 80	19	11.5	98.8
81 – 90	2	1.2	100.0
Total	166	100.0	-

Range = 27 to 85 years; Mean = 55.8 years; Mode = 48 and 65 years.

Source: Field Data, 2003.

The results show that a high percentage of the farmers are aged and ageing. The inference is that it is the aged and ageing people who are engaged in agriculture. The Monitoring and Evaluation Unit of COCOBOD (1988) as well as MASDAR Consultants (1997) made similar observations of the age of farmers in the Ashanti Region.

The government's policy and aim of encouraging the youth to take up farming, among others, in order to reduce the unemployment level in the Region have not been achieved. The implication is that the agricultural sector has still not been attractive enough to lure the youth into it. The findings bring to fore the need to strategize and lure more youth into agriculture. Youth farmers will be more active than the aged and ageing farmers.

4.1.3 Educational Level of Farmers

The educational qualifications of respondents were also investigated in the study. The results are presented in Table 3. The table shows that 32.9% of the respondents had no formal education and 53.0% of them possessed Middle School Leaving Certificate. Two respondents possessed Diploma in Business Studies (Accounting) and Bachelor of Science (Agriculture) certificate respectively.

Table 3. Level of Education of Farmers

Level of Education	Frequency	Percent
No formal education	54	32.9
Middle Sch. Leaving Certificate	87	53.0
Senior Secondary School Certificate	6	3.7
General Certificate of Education	8	4.9
Post Secondary Sch. Teacher Certificate	3	1.9
Teacher Certificate 'A'	2	1.2
General Certificate of Agriculture	2	1.2
Diploma in Business Studies (Accounting)	1	0.6
University Education	1	0.6
Total	164	100.0

Source: Field Data, 2003.

Generally, the finding is quite satisfactory because over 67.0% of the respondents had formal education which would enhance their ability to receive and understand agricultural information from extension agents to enable them perform

their jobs. Byrness and Byrness (1978) state that a farmer's level of education, to some extent, determines the type of tasks he can undertake in any programme, and therefore the type and level of participation and Cernea (1981) also observes that a farmer with a high level of education is expected to be able to participate in more extension activities than one with a lower level of education. However, the literate farmers would have advantage over the illiterate ones in receiving, decoding and understanding extension information messages to improve their farming knowledge and skills.

4.1.4 Working Experience of Farmers

The results of working experiences of farmers are presented in Table 4. The respondents had been farming between one and 65 years with a mean of 26.3 years. The modal working experience was 20 years. Majority (70.7%) of the respondents had worked between 10 and 33 years. Only 4.5% were with less than 10 years experience.

The results have revealed that most of the farmers have a high working experience in farming and would have adopted many of the recommended practices and improved their performance on their farms. It is likely therefore that productivity of their farms would be high if their socio-economic problems were also addressed.

Table 4. Working Experience of Farmers

Age (Years)	Frequency	Percent	Cumulative %
Less than 10	7	4.5	4.5
10 – 15	27	17.2	21.7
16 – 21	42	26.7	48.4
22 – 27	18	11.5	59.9
28 – 33	24	15.3	75.2
34 – 38	8	5.1	80.3
40 – 45	14	8.9	89.2
46 – 51	9	5.7	94.9
52 – 57	4	2.6	97.5
58 – 63	3	1.9	99.4
64 –69	1	0.6	100.0
Total	157	100.0	-

Range = 1 to 65 years; Mean = 26.3 years; Mode = 20 years.

Source: Field Data, 2003.

4.1.5 Relationships between the EOAED and Demographic Characteristics of Farmers

Some characteristics of farmers are believed to have influence on their performance. This had been revealed by research findings of earlier researchers including Celis (1971), Byrness and Byrness (1978), La-Anyane (1985), and Budke and Paddie (1994). For example, Byrness and Byrness (1978) suggest that education enhances one's ability to receive, decode and understand information and that information processing and interpretation are important for performing

many jobs. They state further that education may make a farmer more receptive to advice from an AEA or more able to deal with technical recommendations that require a certain level of literacy while La-Anyane (1985) also reports that the average age of farming community in Ghana lies between 50 and 60 years and this affects productivity. In many cases, health and declining age have a positive relationship with work a farmer can do.

The relationships between the EOAED and the demographic characteristics of farmers are presented in Table 5 and discussed based on Davis convention (Appendix 1). Statistically, there were no significant relationships between the EOAED and all the characteristics of farmers studied at the 0.05 alpha level. However, there were negligible relationships between the EOAED and the age, level of education and the working experience of farmers.

At the time of the survey, the ages of the respondents ranged from 27 to 85 years with a mean age of 55.8 years. However, most of them were 48 and 65 years (Table 2). The respondents therefore were old and ageing. While not significant at the 0.05 alpha level, it is worthy to note that a negligible and negative relationship was observed between the EOAED and age of the farmers ($r = -.032$). The observation was similar to one observed by La-Anyane (1985) who states that health and declining age have a positive relationship between age and work that a farmer can do. Old farmers are less likely to perform heavy tasks. La-Anyane (1985) observes that the average age of the farming community in Ghana lies between 50 and 60 years and this affects production.

Table 3 shows that a total of 32.9% of the respondents did not have formal education. The illiterate respondents would not be able to receive and understand readily the advice given by the extension agents as the literate ones since education

affects farmer's ability to decode information about new technology and relate to farming operations (Gordon, 1976).The positive relationship observed between the EOAED and the level of education of respondents indicates that the higher the level of education of the respondents, the more they decoded and understood extension messages. This could enhance the EOAED

Averagely, the farmers had 26.3 years working experience but most of them had worked for 20 years (Table 4). A positive relationship was observed between the EOAED and the working experience of farmers. However, the relationship was negligible and not statistically significant at the 0.05 alpha level. Tables 4 and 46 show that the farmers had long working experience and 50.9% of them had also worked with AEAs between 7 and 10 or more years. Given the necessary credits, inputs and encouragement, the farmers would perform effectively on their farms.

Table 5. Relationships between EOAED and Selected Demographic Characteristics of Farmers

	X_1	X_2	X_3	X_4
X_1	1.000			
X_2	-.032	1.000		
X_3	.088	-.326**	1.000	
X_4	.034	.708**	-.436**	1.000

X_1=Effectiveness of agricultural extension delivery (EOAED)

X_2= Age of farmers

X_3 = Level of Education

X_4 = Working experience

Source: Field Data, 2003

4.2 DEMOGRAPHIC CHARACTERISTICS OF AEAs AND THEIR RELATIONSHIP WITH EOAED

4.2.1 Sex of AEAs

The results revealed that 90.0% of the AEA respondents were males and only 10.0% were females (Table 6). In Ghana, the MOFA recruits and trains extension personnel at its Agricultural Colleges and distributes the successful graduates to all the regions. It is pathetic, however, to observe that the number of females who are recruited and trained by the Colleges is always inadequate. The males recruited always out-number the females. This situation needs to be reviewed to enable the regions have additional female AEAs.

Table 6. Sex Distribution of Agricultural Extension Agents (AEAs)

Sex	Frequency	Percent
Male	81	90.0
Female	9	10.0
Total	90	100.0

Source: Field Date, 2003

Notwithstanding the disparity in the recruitment, it is a good observation that there were more male AEAs in the study area because the study has also revealed that there were more male farmers than the females (Table 1). The male AEAs would be freer to work with the male farmers than the females. Similar observation was made by Obinne (1992) in the Bendel State of Nigeria. However, Obinne suggested that it was not good for most of the extension agents to be males in a culture where interaction between males and females was limited.

4.2.2 Age of AEAs

Table 7 shows the age distribution of AEAs. Their ages ranged from 21 to 60 years with a mean age of 38.9 years. Bi-modal ages were 39 and 42 years at the time of the survey. Majority (93.0%) of the respondents were up to 50 years. Only 7.0% were over 50 years.

Compared with the farmers, the AEAs were younger with a mean age of 38.9 years than that of the farmers, 55.8 years (Tables 2 and 7). They would perform creditably when the AEAs were given the necessary logistics, and they were well motivated (all things been equal).

Table 7. Age Distribution of AEAs

Age (Years)	Frequency	Percent	Cumulative %
Below 30	7	9.7	9.7
30 – 40	34	46.2	55.9
41 – 50	28	37.1	93.0
51 – 60	5	7.0	100.0
Total	74	100.0	-

Range = 21 to 60 years; Mean = 38.9 years; Mode = 39 and 42 years.

Source: Field Data, 2003.

4.2.3 Educational Level of AEAs

Table 8 shows the educational levels of AEAs in the study area. The lowest qualification is Middle School Leaving Certificate and the highest is Bachelor of Science (Agriculture) certificate. Seventy-two (81.9%) of the respondents possessed Certificate in General Agriculture, 9.1 % had General Certificate of Education and one with a Senior Secondary School Certificate. There were also one Middle School Leaving Certificate, five Diploma in Agriculture and a B.Sc Agriculture certificate holders, respectively.

Table 8. Educational Qualifications of AEAs

Level of Education	Frequency	Percent
Middle School Leaving Certificate (MSLC)	1	1.1
Senior Secondary School Certificate (SSSC)	1	1.1
General Certificate of Education (GCE)	8	9.1
Certificate in General Agriculture	72	81.9
Diploma in Agriculture	5	5.7
B.Sc (Agriculture) Certificate	1	1.1
Total	88	100.0

Source: Field Data, 2003.

4.2.3.1 Training Colleges and Year of Appointments of AEAs

Thirty-six (40.9%) of the respondents had their initial training at Kwadaso Agricultural College while 20.5% were trained at Ejura Agricultural College. Nyankpala Agricultural College and Bunso Cocoa College trained 13.6% of the AEAs, respectively. In order of percentages, Ohawu Agricultural College, Pong-Tamale Veterinary College and Damango Agricultural College also trained 5.7%, 3.4% and 2.3% of the respondents respectively. Majority (67.9%) of the AEAs were appointed between 1985 and 1994. The AEAs had the minimum basic requisite training and qualifications before being appointed. (Tables 9 and 10)

Education plays a very important role in AEAs' ability to understand and transfer agricultural technologies. Sabihi (1978) observes that AEAs with lower educational levels need greater training in principles on which human behaviour is based, ethics and system of beliefs. He (Sabihi) further observes that the AEAs with lower educational levels perceived a greater need for organization and

administration. Amon (1989) even suggests that qualification of middle level administrators and supervisors should be university degree with special training in extension education.

Table 9. Initial Training Institutions of AEAs

Institution	Frequency	Percent
Kwadaso Agricultural College	36	40.9
Ejura Agricultural College	18	20.5
Ohawu Agricultural College	5	5.7
Nyankpala Agricultural College	12	13.6
Bunso Cocoa College	12	13.6
Damango Agricultural College	2	2.3
Pong-Tamale Vet College	3	3.4
Total	88	100.0

Source: Field Data, 2003.

Table 10. Year of Appointments of AEAs

Year of appointment	Frequency	Percent	Cumulative %
1975 –1979	6	6.9	6.9
1980 – 1984	4	4.6	11.5
1985 – 1989	21	24.1	35.6
1990 – 1994	38	43.8	79.4
1995 – 1999	9	10.3	89.7
2000 and after	9	10.3	100.0
Total	87	100.0	-

Source: Field Data, 2003.

4.2.4 Length of Service of AEAs

The AEAs' working experiences ranged from 1 to 28 years with a mean and mode of 12 years respectively. Majority of the respondents (74.5%) had worked from seven to twenty years while 3.3% had been working for between twenty six and thirty years. The AEAs therefore had rich working experience at the time of the survey (Table 11). Given the necessary and adequate logistics and incentives, the AEAs would perform creditably since they had long experience.

Table 11. Length of Service of AEAs

Experience (Years)	Frequency	Percent	Cumulative %
1 – 6	12	13.3	13.3
7 – 10	28	31.1	44.4
11 – 15	28	31.1	75.5
16 – 20	11	12.3	87.8
21 – 25	8	8.9	96.7
26 – 30	3	3.3	100.0
Total	90	100.0	-

Range = 1 to 28 years; Mean = 12.0 years; Mode = 12.0 years

Source: Field Data, 2003.

4.2.5 Relationship between the EOAED and the Demographic Characteristics of AEAs

In this section, relationships between the EOAED and demographic characteristics of agricultural extension agents (AEAs), are discussed, using Pearson product- moment correlation analysis. The result showed that there was a significant relationship between the EOAED and length of service of AEAs (r = .288). While not significant at the 0.05 alpha level, it is worthy of note that a positive relationship was also observed between the EOAED and the level of education of AEAs (r = .126). However, the relationship between the EOAED and age of the AEAs was negligible and negative (r = -.028) (Table 12), indicating that the younger the AEAs were, the more active and effective they would perform their duties to enhance the EOAED.

Table 12. Relationships between EOAED and Demographic Characteristics of AEAs

	X_1	X2	X_3	X_4
X_1	1.000			
X_2	-.028	1.000		
X_3	.126	.154	1.000	
X_4	.288*	.413*	-.003	1.000

X_1=Effectiveness of Agricultural Extension Delivery (EOAED)

X_2=Age of AEAs

X_3=Level of Education of AEAs

X_4=Length of Service of AEAs

Source: Field Data, 2003

The results of the study showed that the agricultural extension agents (AEAs) had 12 years mean working experience and most of them had also worked for 12 years (Table 11). There is no doubt that the AEAs were experienced at the time of the survey. However, the inadequate supply of logistics and insufficient means of transport for the AEAs could adversely affect their performance and the EOAED.

4.3 AGRO-ENTERPRISES OF FARMERS

Objective 2 examined agro-enterprises of farmers in terms of:

- Land acquisition;
- Types and sizes of the agro-enterprises;
- Access to and cost of labour;
- Farm inputs;
- Sources of capital and credit

4.3.1 Land Acquisition

The results of the survey of the modes of land acquisition for farming are presented in Table 13. Four sources: family land, purchased land, share-cropping and leasehold were identified during the survey. Majority (61.0%) of the respondents established farms on family lands while 13.2% and 18.2% farmed on purchased and share-cropping lands respectively. Only 7.6% of the respondents held lands on lease (Table 13).

Table 13. Land Acquisition for Farming

Source	Frequency	Percent
Family land	97	61.0
Purchased land	21	13.2
Share-cropping	29	18.2
Leasehold	12	7.6
Total	159	100.0

Source: Field Data 2003

It is not surprising that majority of the farmers farm on family lands because such lands are usually less costly than other modes of land acquisition. However, farming on family lands may not be the best in terms of farm maintenance and expansion. On family lands, when the farmer dies, the farm reverts back to the family and the next-of-kin may not be resourceful to maintain the farm. Sometimes, the farm of the deceased is divided amongst the family members including the children, and the sizes of the farms may not be economic to sustain adoption of technologies and thereby adversely affect yields from the fragmented farms.

4.3.2 Types of Crops Cultivated

Tables 14 to 17 show frequency distributions of respondents who had cultivated cash crops, cereals, fruits, vegetables, roots and tuber crops in the study area. In general, and in order of percentages, most of the respondents had cultivated cocoa, cassava, maize, oil palm, cocoyam, yam, and plantain on a wider scale than other crops.

For the cash crops (Table 14), 84.9% of the respondents had planted cocoa while 45.2% had grown oil palm. Others, 8.4%, 4.8% and 3.6%, had citrus, coffee and coconut on their farms respectively.

Table 14. Frequency Distribution of Cash Crop Farmers

Crops	Growers' Frequency	Percent
Cocoa	141	84.9
Oil palm	75	45.2
Citrus	14	8.4
Coffee	8	4.8
Coconut	6	3.6

N = 166 (Multiple Responses)

Source: Field Data 2003

Maize and rice were the predominant cereals planted and their corresponding percentages of respondents were 73.0% and 27.0% respectively (Table 15).

Table 15. Distribution of Cereal Crop Farmers.

Crop	Growers' Frequency	Percent
Maize	119	73.0
Rice	44	27.0

N = 163 (Multiple responses)

Source: Field Data 2003

At the time of the survey, some of the respondents had also cultivated fruits and vegetables. Plantain and pineapple had been cultivated by 23.6% and 7.9% of the respondents while pepper, soyabean, okro and tomato vegetables had been gown by 8.5%, 7.9%, 6.7% and 5.5% of the respondents respectively. Other vegetables grown were egg plants, carrot and cowpea. None of the respondents had grown cabbage and lettuce (Table 16).

Table 16. Distribution of Fruits and Vegetable Farmers

Crop	Growers' Frequency	Percent
Plantain	39	23.6
Pineapple	13	7.9
Pepper	14	8.5
Soyabean	13	7.9
Okro	11	6.7
Tomato	9	5.5
Onion	7	4.2
Egg plant	5	3.0
Carrot	3	1.8
Cowpeas	1	0.6
Cabbage	-	-
Lettuce	-	-

N = 165 (Multiple Responses)

Source: Field Data, 2003

Cassava, cocoyam and yam were the root and tuber crops which had been cultivated by 79.5%, 44.0%, and 28.9% of the respondents respectively at the time of the survey. Table 17 shows the distribution of the roots and tuber crop farmers.

Table 17. Distribution of Roots and Tuber Crop Farmers

Crop	Growers' Frequency	Percent
Cassava	132	79.5
Cocoyam	73	44.0
Yam	48	28.9

N = 166 (Multiple responses)

Source: Field Date, 2003

It is not surprising that most (84.9%) of the respondents had planted cocoa. Cocoa production plays a very important role in the economic development of Ghana. The crop has been the driving force and backbone of Ghana's economy. For these reasons, the government has provided a sound and ready market for cocoa produce, and the cocoa farmers are always assured of ready and stable market. The government is committed and has continuously increased the producer price of cocoa in addition to payments of regular bonuses. This therefore has provided an enabling environment for cocoa production. Cocoa is also a life long security for farmers. Unlike cocoa, other crop farmers sometimes have to grapple with unstable and fluctuating markets. It is not uncommon to find some of their produce perish for lack of markets.

4.3.3 Sizes of Farms

The mean sizes of farms for respondents of cash crops, cereals, fruits, vegetables and other crops were surveyed during the study. The results are presented in Tables 18-21. The cash crops which were predominantly planted were cocoa, oil palm, coffee, citrus and coconut, In order of magnitude, the mean farm size of (5.8 ha) for cocoa was the highest; followed by oil palm (2.6 ha), coffee (1.6 ha) and citrus (1.2 ha). Coconut was the least planted cash crop with a mean farm size of 0.8 ha (Table 18).

Table 18. Mean Sizes of Farms for Cash Crops

Crop	Range (Ha)	Mean (Ha)	Mode (Ha)
Cocoa	0.2 – 40.5	5.8	4.0
Oil palm	0.2 – 20.2	2.6	1.2
Coffee	0.6 – 6.1	1.6	0.4 and 0.8
Citrus	0.2 – 4.9	1.2	0.4
Coconut	0.1 – 1.6	0.8	-

N = 166 (Multiple responses)

Source: Field Data, 2003

The mean sizes of farms cultivated by respondents for rice and maize were 1.3ha and 1.2ha respectively (Table 19).

Table 19. Mean Sizes of Farms for Cereals

Crop	Range (Ha)	Mean (Ha)	Mode (Ha)
Rice	0.8 – 2.0	1.3	-
Maize	0.2 – 12.1	1.2	0.8

N = 165 (Multiple Responses)

Source: Field Data, 2003

The fruits and vegetables grown have the following means sizes: plantain (1.3ha), pineapple (0.6ha), cowpea (0.8ha), okra (0.5ha), onion (0.5ha), tomato (0.5ha), egg plant (0.3ha) and pepper (0.3ha), among others while the mean sizes of farms put under root and tuber crops, cassava cocoyam and yam, were 1.2ha, 0.9ha and 0.5ha, respectively (Tables 20 and 21).

Table 20. Mean Size of Farms for Fruits and Vegetables

Crop	Range (Ha)	Mean (Ha)	Mode (Ha)
Plantain	0.1-21.9	1.3	0.8
Pineapple	0.4 – 2.0	0.6	0.4
Cowpea	-	0.8	-
Okra	0.1 – 1.6	0.5	0.2
Onion	0.4 – 0.8	0.5	0.4
Tomato	0.2 – 0.8	0.5	-
Soyabean	-	0.4	-
Carrot	-	0.4	-
Eggplant	0.2 – 0.4	0.3	0.4
Pepper	0.4 – 0.8	0.3	0.4

N = 165 (Multiple responses)

Source: Field Data, 2003

Table 21. Means Sizes of Farms for Root and Tuber Crops

Crop	Range (Ha)	Mean (Ha)	Mode (Ha)
Cassava	0.1-12.1	1.2	0.8
Cocoyam	0.1 – 8.1	0.9	0.8
Yam	0.1 – 3.2	0.5	0.8

N = 166 (Multiple responses)

Source: Field Date, 2003

4.3.4 Livestock

The types and quantity of livestock in the research area were also identified (Tables 22-26). The results show that there were few cattle rearers in the area. Only 4.3% of the respondents had 10 to 40 cattle in their kraals (Table 22). It can therefore be inferred from the table that many of the respondents did not rear cattle.

Table 22. Frequency Table of Cattle Rearers

Number	Frequency	Percent
Non-cattle rearers	152	93.9
1	1	0.6
2	2	1.2
10	2	1.2
15	1	0.6
30	1	0.6
40	3	1.9
Total	162	100.0

Source: Field Data, 2003

Twenty-nine (17.9%) of the respondents had between one and ten sheep. It was only three respondents who had over fifty sheep. However, majority (25.3%) of the respondents had between one and twenty sheep (Table 23). Table 24 also showed the distribution of goat rearers. Some (17.2%) of the respondents had between one and ten goats and only 2.5% of the respondents had over thirty goats in their pens. When the results are compared, there are more sheep than goats in the study area (Tables 23 and 24).

Table 23. Distribution Table of Sheep Rearers

Number	Frequency	Percent
Non-sheep rearers	113	69.8
1-10	29	17.9
11-20	12	7.4
21-30	2	1.2
31-40	2	1.2
41-50	1	0.6
Over 50	3	1.9
Total	162	100.0

Source: Field Data, 2003

Table 24. Distribution of Goat Rearers

Number	Frequency	Percent
Non-goat rearers	115	70.9
1-5	14	8.6
5-10	14	8.6
11-15	5	3.2
16-20	4	2.5
21-25	4	2.5
26-30	2	1.2
Over 30	4	2.5
Total	162	100.0

Source: Field Data, 2003

Table 25 shows that 4.9% of the respondents had pigs in the study area. They had a total of 132 pigs at the time of the survey. It can be inferred from the table that many (95.1%) respondents had no pig farms. Though nourishing, most farmers in the Ashanti Region do not eat pork and that might have accounted for the low interest in pig farming in the study area.

Table 25. Distribution of Pig Farmers

Number	Frequency	Percent
Non-pig rearers	154	95.1
8	1	0.6
10	1	0.6
14	1	0.6
20	1	0.6
30	1	0.6
50	3	1.9
Total	162	100.0

Source: Field Date, 2003

Poultry farms and numbers of birds of farmers were also examined. The results show that each of the 18.5% respondents had less than 50 birds and 5.5% had between 50 and 650 birds in their farms. Only 2.5% of the respondents had over 650 on each farm (Table 26). The general impression of the public that poultry farming has caught on well with farmers in the region needs to be re-examined; perhaps, poultry farming has sprung up mainly in the cities and district capitals in the region.

Table 26. Distribution of Poultry Farmers

Number	Frequency	Percent
Non-poultry rearers	119	73.5
Less than 50	30	18.5
50-250	7	4.3
251-450	1	0.6
451-650	1	0.6
Over 650	4	2.5
Total	162	100.0

Source: Field Date 2003

4.3.5 Access to and Cost of Labour

Farmers' sources of labour were examined in the study. Tables 27-30 show the results of analyses of responses of the farmers. The analysis shows that 39.2% of the respondents depended on hired labour, 33.5% on family labour and 24.1% on caretakers for farming operations. Together, a high proportion (72.7%) of the respondents depended on hired and family labour for farming operations. Only 3.2% of the respondents depended on communal labour (Nnoboa) for farming activities (Table 27).

Table 27. Sources of Labour to Farmers

Sources	Frequency	Percent
Hired labour	62	39.2
Family	53	33.5
Caretaker	38	24.1
Communal labour (nnoboa)	5	3.2
Total	158	100.0

Source: Field Data, 2003

4.3.5.1 Availability of Labour

When asked to indicate their perceptions of the availability of labour during land preparation (land clearing, tree felling, hole making and planting of material) and maintenance of farms during planting and harvesting seasons, 24.2% of the respondents stated that labour was always available while 54.1% and 21.7% respondents said that labour was sometimes available and not available respectively (Table 28). The responses clearly show that most of the farmers had difficulty in securing adequate labour for farming operations.

Table 28. Farmers' Perceptions of Availability of Labour

Perception	Frequency	Percent
Always available	38	24.2
Sometimes available	85	54.1
Not available	34	21.7
Total	157	100.0

Source: Field Data, 2003

4.3.5.2 Proportion of Time Provided by Family Labour

Pertaining to the proportion of labour provided by family members (farmer, wife and children combined) on the farm, 33.1% of the respondents indicated that family members provided less than 10% of their time on their farms while 29.5% of the members spent between 10 and 40% of their time on the farms. Sixty-one (37.4%) of the family members spent over 40% time on farms (Table 29).

Table 29. Proportion of Time Provided by Family Labour

Number	Frequency	Percent	Cumulative %
Less than 10%	54	33.1	33.1
10-20%	26	16.0	49.1
21-30%	13	8.0	57.1
31-40%	9	5.5	62.6
Over 40%	61	37.4	100.0
Total	163	100.0	-

Source: Field Data, 2003

The results have shown that hired and family labour play an important role in providing labour since 72.7% farmers depended on them for farming operations and 21.7% of the respondents said that labour was not available (Table 27 and 28). The family source of labour is now scarce because of out-migration of children and other dependents. There is therefore the need to take measures to improve the cash flows to farmers such as seasonal credits to enable farmers hire and pay for labour.

4.3.5.3 Labour Cost Per Manday (By-Day)

There is a wide range of labour cost per manday in the study area. It ranges from ¢8,000.00 to ¢20,000.00. The mode cost per man-day was ¢15,000.00, which indicates that most of the farmers hired labour at ¢15,000.00 on their farms (Table 30).

Table 30. Labour Cost per Manday (By Day)

Cost per manday (¢)	Frequency	Percent
8,000	3	1.8
10,000	51	31.3
11,000	2	1.2
12,000	42	25.8
12,500	1	0.6
13,000	1	0.6
15,000	55	33.7
16,000	1	0.6
17,000	2	1.2
20,000	5	3.2
Total	163	100.0

Range = ¢8,000-¢20,000; Mean = ¢12641.10; Mode = ¢15,000

Source: Field Data 2003

4.3.5.4 Farmers' Perceptions of Cost of Labour Per Manday (By-Day)

Farmers were also asked to indicate their perceptions of the cost of hired labour per manday (by day) in the study area. Their perceptions are shown in Table 31. A high percentage (81.8%) of the respondents perceived the cost per man-day as high. It is not surprising that the cost was bound to be high in the study area where most respondents had difficulty in securing labour for farming operations (Table 28).

Table 31. Farmers' Perceptions of Cost of Labour Per Manday (By-Day)

Perceptions	Frequency	Percent	Cumulative %
Very high	83	50.3	50.3
High	52	31.5	81.8
Moderate	27	16.4	98.2
Low	3	1.8	100.0
Very low	-	-	100.0
Total	165	100.0	-

Source: Field Data, 2003

4.3.6 Farm Inputs

Perceptions of farmers in respect of availability of farm inputs, distances to the farm inputs and costs of the inputs were examined. The results are presented in Tables 32-34.

4.3.6.1 Availability of Farm Inputs

The results show that 31.9% respondents always had farm inputs to buy while 47.0% of the respondents stated they sometimes had inputs to buy. Some (21.1%) respondents indicated that the farm inputs were not available (Table 32).

Table 32. Availability of Farm Inputs as Perceived by Farmers

Perception	Frequency	Percent
Always available	53	31.9
Sometimes available	78	47.0
Not available	35	21.1
Total	166	100.0

Source: Field Data, 2003

4.3.6.1.1 Distances to Source of Farm Inputs

Nearly half the number (48.2%) of the respondents further stated that they travelled to less than 8km to buy farm inputs while some (26.5%) travelled between 8 and 24km. The farthermost point that a farmer travelled for inputs was over 40.0km (Table 33).

Table 33. Distances to Source of Farm Inputs

Distance (Km)	Frequency	Percent
Less than 8	80	48.2
8-16	33	19.9
17-24	11	6.6
16-32	12	7.2
33-40	2	1.2
Over 40	28	16.9
Total	166	100.0

Source: Field Date, 2003

4.3.6.2 Farmers' Perceptions of Cost of Farm Inputs

The majority (68.9%) of the respondents perceived the cost of the farm inputs as being high while 18.9% indicated the costs of the inputs were moderate (Table 34). Scarcity and high costs of farm inputs adversely affect maintenance levels and productivity of farms. The farmers for this study recommended the establishment of District Assemblies farm inputs stores and the re-introduction of subsidies on farm inputs (Table 83). The recommendation will go a long way to improve extension delivery. With the re-introduction of subsidies on farm inputs and the establishment of District farm input stores, farmers will have the opportunity to access the inputs easily and at reduced and controlled prices. The AEAs also recommended the re-introduction of subsidies on farm inputs since

some farmers were unable to purchase the high-cost farm inputs for farm operations.

Table 34. Farmers' Perceptions of Cost of Farm Inputs

Perception	Frequency	Percent	Cumulative %
Very high	28	17.1	17.1
High	85	51.8	68.9
Moderate	31	18.9	87.8
Low	17	10.4	98.2
Very low	3	1.8	100.0
Total	164	100.0	-

Source: Field Data, 2003

4.3.7 Sources of Capital and Credit

Finance plays a very important role in farming. With finance, farmers can acquire the necessary farm machinery and equipment that can help them establish farms. They can buy and use essential inputs such as fertilizers, improved seeds, insecticides, weedicides and also hire labour for maintenance of farms.

Personal savings of farmers formed a major source (57.9%) of capital for establishing the farms. Family source and loans from banks, each accounted for 10.4% (Table 35).

Table 35. Sources of Financial Capital for Establishing Farms

Source	Frequency	Percent
Personal Savings	95	57.9
Money lender	30	18.3
Family source	17	10.4
Bank loan	17	10.4
Friends	5	3.0
Total	164	100.0

Source: Field Data, 2003

As shown in Table 35, only 10.4% of the respondents had financial assistance from banks to establish their farms. This is a clear indication of the very limited access that farmers have to credit from formal financial institutional sources. Some of the farmers (24.2%) said they could not tell or say whether it was easy to contract loans/credit with the financial institutions. They further stated that they had never requested for loans/credits from the banks (Table 36).

Table 36. Farmers' Descriptions of Financial Assistance from Financial Institutions

Description	Frequency	Percent	Cumulative %
Very easy	2	1.3	1.3
Easy	8	5.4	6.7
Difficult	35	23.5	30.2
Very difficult	68	45.6	75.8
Cannot say/tell	36	24.2	100.0
Total	149	100.0	

Source: Field Data, 2003

4.3.7.1 Major Problems for Credit Encountered by Farmers

Responses to questions on problems encountered by farmers with regard to access to financial assistance from financial institutions revealed that high interest rates, cumbersome processing procedure and lack of collateral security were the farmers' major problems. The results are presented in Table 37.

Fifty-nine (38.6%) of the respondents indicated high interest rate as their major problem while 15.0% stated that the cumbersome processing procedure was their biggest problem. Lack of collateral security accounted for 3.3%. Some (43.1%) respondents did not say or give reasons. Similar observations were made by Owusu Acheampong (1986) and Lele (1975) that high interest rates and lack of security were problems faced in securing credit from financial institutions. To help

farmers operate efficiently by way of farm maintenance, there is the need to evolve a sound credit facility for them.

Table 37. Major Problems for Credit Encountered By Farmers

Problem	Frequency	Percent
High interest rate	59	38.6
Cumbersome processing	23	15.0
Lack of collateral security	5	3.3
Cannot say /tell	66	43.1
Total	153	100.0

Source: Field Data, 2003

4.3.7.2 Reasons of Farmers Inability to Pay Back Loans/Credit

The study also examined farmers' ability to pay back credits/loans. The farmers, who indicated that they received credit, said they were unable to pay back. The reasons for their inability to pay back the loans are shown in Table 38.

Table 38. Reasons for Inability of Farmers to Pay Back Credits/Loans

Reasons	Frequency	Percent
High interest rate	93	77.5
Vagaries of weather and poor yields	86	71.7
Poor timing and release of credit /loan	58	48.3
Short pay back periods for loans	53	44.1
High cost of labour	40	33.1
Low prices for produce	22	28.3
Cannot say or tell	46	27.7

N = 166 (Multiple responses)

4.3.8 The Relationships between EOAED and the Availability of Labour, Availability of Farm Inputs to Farmers and Distances to the Sources of Farm Inputs.

Pearson product moment correlation coefficients showing the relationships are presented in Table 39. The results indicated positive relationships between the EOAED and availability of labour (r=.012) as well as between the EOAED and availability of farm inputs (r=.109). The table further shows a negative correlation between the EOAED and distances to the sources of farm inputs (r= - .239) at 0.05 alpha level.

The positive correlation which was also observed between the EOAED and the availability of farm inputs showed that a high level of the EOAED was associated with more farm inputs and a low EOAED was associated with less availability of farm inputs.

The correlation between the EOAED and distances to sources of farm inputs was negative, indicating that a high level of EOAED was associated with short distances to the farm inputs and conversely, a low level of the EOAED was associated with far distances to the inputs.

The implication is that availability of labour and farm inputs have influence on EOAED and that efforts should always be made by farmers to secure labour and farm inputs to make agricultural extension delivery effective. With labour and farm inputs, farmers would be able to undertake farming operations. Some recommended practices by AEAs to farmers depend highly on labour and farm inputs.

Table 39. Relationships between EOAED and Availability of Labour, Farm Inputs and Distances to Sources of Farm Inputs

	X_1	X_2	X_3	X_4	X_5
X_1	1.000				
X_2	.012	.016	1.000		
X_3	.109	-.044	.024**	1.000	
X_4	-.239**	-.171	-.009	.360**	1.000

X_1 = Effectiveness of Agricultural Extension delivery (EOAED).

X_2 = Availability of Labour

X_3 = Availability of Farm inputs

X_4 = Distances to sources of Farm inputs.

Source: Field Data, 2003.

4.4 EXTENSION INFORMATION DELIVERY AND SUPPORT FACTORS

4.4.1 Introduction:

This section (Objective 3) examines and assesses the professional competence and motivation of the agricultural extension staff (AEAs), farmers' contact with AEAs, extension policy and funding of programmes. The section further examines farmers' participation in extension programme planning and implementation, logistical support for AEAs and extension education methods used by the AEAs. Linkages between research, extension and farmers as well as availability of markets for farm produce are also examined. It is concluded with the results of correlational analysis to determine the relationships between the

effectiveness of agricultural extension delivery (EOAED) and some of the above variables.

4.4.2 Professional Competence of AEAs.

The effects of extension depend, to a large extent, on the professional competence of the agents (Van den Ban and Hawkins, 1986). A worker becomes more competent to perform his duties when the worker is given the necessary training, logistical support and motivation (Beder, 1990).

4.4.2.1 Seminars and Workshops

The results of the study show that the AEAs attended seminars and workshops to improve their competence between 1994 and 2003 (Table 40). A high percentage (85.0%) of the respondents attended the seminars and workshops between 2002 and 2003.

Table 40. Year in which AEAs Attended Last Seminars and Workshops

Year	Frequency	Percent
1994	1	1.5
1995	2	3.0
1997	1	1.5
1998	2	3.0
1999	1	1.5
2001	3	4.5
2002	38	57.7
2003	18	27.3

N= 66

Source: Field Data, 2003

4.4.2.2 Major Themes of Seminars and Workshops

The themes for the seminars and the workshops were important and useful as far as agricultural development was concerned. Of the 17 themes listed in Table 41, 76.5% of the respondents attended HIV/AIDS and agricultural development seminars while 55.2% attended monitoring and evaluation of RTIP. Cocoa agronomy and pest control and planning, execution and evaluation themes were attended by 51.7% and 48.2% AEAs respectively. Other important themes included multiplication and utilization of cassava, integrated pest management and fish farming. Themes which received poor attendance were extension methodology, grasscutter production, the use of animals for traction, maize and cowpea production and the use of poultry manure (Table 41).

Table 41. Major Themes of Seminars and Workshops

Themes	Frequency	Percent
HIV/AIDS and agric development	65	76.5
Monitoring and evaluation of RTIP	47	55.2
Agronomy and pest control of cocoa	44	51.7
Planning, Execution and evaluation	41	48.2
Multiplication and utilization of cassava	41	48.2
Integrated pest management	32	37.6
Fish farming	28	32.9
Land and water management	22	25.9
HI- Tech Cocoa Production	19	22.4
Solar drying	13	15.3
SFSP Team building	9	10.6
Yam immunize production	9	10.6
Extension methodology	7	8.2
Grasscutter production	7	8.2
Animal traction	7	8.2
Maize and cowpea production	7	8.2
Use of poultry manure	7	8.2

N= 85 (Multiple responses). Source: Field Data, 2003

Seminars and workshops are organized for AEAs to update and improve their technical knowledge and performance. According to Olson and Fruin (1979), a higher level of in-service training and skills is needed if extension staff were to collaborate effectively with farmers in applying technical knowledge. Ayewoh (1983) also reports that extension agents should learn on the jobs through seminars and workshops. It was, therefore, disheartening to note of the poor attendance at some of the seminars and workshops organized for the AEAs (Table 41). The reasons might be administrative, supervisory, motivational, apathetic and health conditions of the AEAs.

Administratively, the poor attendance might be ascribed to possible delays and late receipt of invitation letters by some of the AEAs to attend the seminars or workshops.

Some of the AEAs' operational zones were in remote areas and far from their district headquarters. They usually came to the headquarters fortnightly on report days. Therefore, if for any reason the invitation letters were not received on time, some of the AEAs would not attend the scheduled seminars and workshops.

Some of the AEAs might have also absented themselves from the seminars and workshops because of weak supervision by their superiors, especially the District Development Officers (DDOs), their immediate supervisors. According to Benor and Baxter (1984), supervision determines whether the extension system is operating effectively in both organizational and technical areas and identify key constraints to effectiveness.

It was therefore expected that the AEAs would be supervised effectively by the DDOs. Therefore, if there was any lapse and the DDOs did not know the movements of their AEAs, information inviting the AEAs to attend the seminars or

workshops would be received by the DDOs but the AEAs would not be informed to attend.

Low motivation of AEAs and AEAs' apathy towards seminars or workshops might have adversely affected their attendance. The study revealed that the AEAs were lowly motivated. Over 76.7%, 74.2% and 88.9% of the AEAs stated that they had poor working conditions, untimely and irregular promotion prospects and inadequate salaries respectively. AEAs would therefore show some apathy towards seminars or workshops and abscond from them.

The health conditions of the AEAs might have also accounted for part of the poor attendance at the seminars or workshops. Perhaps some of the AEAs were ill and could not attend.

The seminars and the workshops organized for the AEAs were invaluable because they updated and improved their technical knowledge. However, the poor attendance, especially those on the extension education methods, could adversely affect the effectiveness of the agricultural extension delivery in the study area. Arrington and Bradshaw (1994) advocate that extension workers must become skilled in a wide variety of teaching methods so they can select the best single one or combination of several methods that will get across a particular message to an individual or a group in the most efficient and effective manner possible. The extension education methods are the techniques of communication between AEAs and target groups (Albrecht, 1989). A workshop or seminar on such an important theme should have attracted large attendance.

4.4.2.3 Mean Levels of Perceived Competence of AEAs by AEAs

Frequency distribution and mean levels of perceived competence of AEAs by themselves are presented in Table 42. The overall competence of the AEAs was moderate. Fourteen (15.6%) of the 90 respondents perceived their competence as high. Only 12.2% responded that they had low competence. The overall mean and a standard deviation were 3.3390 and 0.4487, respectively.

Table 42. Frequency and Mean Levels of Competence of AEAs

Competence	Frequency	Percent	Mean	Std. Deviation
High	14	15.6	4.3988	0.2146
Fair (moderate)	65	72.2	3.0317	0.1479
Low	11	12.2	2.5864	0.1262
Very low	0	0	0	0

N = 90

Likert scale used: 5 = Very high, 4 = High, 3 = Fair (moderate), 2 = Low and 1 = Very low

Source: Field Data, 2003

4.4.2.4 Rating the Performance of AEAs by DDAs and DDOs

The District Directors of Agriculture (DDAS) and the District Development Officers (DDAs), the immediate supervisors, were asked to appraise and rate the AEAs in respect of their performance in the study area. Sixteen (80%) of the DDOs rated the AEAs' performance as good while 20% indicated that the AEAs performed averagely. The DDAs rated the AEAs 'performance as good (40%) and average (60%). Table 43 shows the appraisal by the DDOs and the DDAs.

Table 43. Rating the Performance of AEAs by DDAs and DDOs

	Performance of AEAs			
	Good	Percent	Average	Percent
DDAs	2	40	3	60.0
DDOs	16	80	4	20.0
N(DDAs) = 5	N(DDOs = 20)			

Source: Field Data, 2003

4.4.3. Motivation of AEAs

4.4.3.1. Introduction

This part of the section deals with motivation of AEAs. The most important resource available to an extension service is its staff members (Van den Ban and Hawkins, 1986). Employees work harder and perform better if they are motivated and satisfied with their jobs (Beder, 1990).

4.4.3.2. Motivational Factors Examined

The factors examined were job satisfaction, recognition of AEAs and their performance, working conditions, promotion and salary levels of AEAs. Of all the motivational factors examined in the study area, 18.9% and 13.3% of the 90 respondents indicated that AEAs were highly recognized and were satisfied with their jobs, respectively. Only 2.2% of them (AEAs) responded they highly enjoyed good working conditions and were regularly promoted (Table 44).

When the motivational factors were compared, majority of the respondents (62.3 % and 41.1%) were moderately satisfied with their jobs and were properly recognized. As many as 76.7% and 74.2 % indicated they had poor working

conditions and untimely and irregular promotion prospects, Further, 88.9% AEAs responded that their salary levels were inadequate and poorly managed by MOFA (Table 44).

Table 44. AEAs' Agreement and Disagreement with The Extent of Motivation

Motivational variables	Percentage of agreement and disagreement				
	5	4	3	2	1
AEAs are satisfied with job	0	13.3	62.3	23.3	1.1
AEAs are properly recognized	0	18.9	41.1	35.6	4.4
AEAs enjoy good working conditions	0	2.2	21.1	61.1	15.6
Promotion prospects are timely and regular	0	2.2	23.6	40.5	33.7
AEAs' salary levels are adequate and managed properly by MOFA	0	4.4	6.7	28.9	60.0

N = 90 (Multiple response)

Scale: 5 = strongly agree, 4 = agree, 3= Somewhat agree,. 2= Disagree, 1= Strongly disagree

4.4.3.3. Mean Levels of Motivational Factors

Table 45 shows the means and standard deviations of the individual motivational factors examined in the study area. The overall mean motivation was

low (x=2.6398, std. deviation=0.7241). However, the respondents were moderately satisfied with their jobs (x=3.3429),

followed by recognition (x=3.1339) and working conditions (x=2.5470)

As indicated in Table 45, the overall motivation was low. This is an unhealthy observation and MOFA management needs to appreciate and address it for effective extension delivery. According to Savile (1974), people like to be recognized and the work which they do should not be taken for granted. They should be told how their work has contributed to the success of an activity. Leonard also notes that in the Vilriga district in Kenya, dissatisfaction among AEAs was widespread as a result of poor prospects for promotion. Casio (1989) proposes that employees with good skills should be provided skill-based salary which is a strong motivating factor for the development of employees' self-esteem and productivity. According to Chambers and Belshaw (1973), unpleasant working conditions contribute to the sense of frustration among AEAs.

Table 45. Mean Levels of Motivational Factors Examined

Factors	Mean	Std. Deviation
Job satisfaction	3.3429	0.5511
Recognition	3.1339	0.7737
Working conditions	2.5470	0.6762
Promotion	2.3393	0.8050
Level of salary	1.8361	0.8143

N = 90 (multiple responses)

Scale: 5 = strongly agree 4= Agree, 3 = Somewhat agree, 2= Disagree, 1=strongly disagree. Source: Field Data, 2003

4.4.4. Farmers' Contact with AEAs (as Perceived by Farmers)

The analysis presented in Table 46 shows that 39.9% of the respondents had worked with AEAs for more than 10 years. Fifty-six (34.3%) of the respondents had between 3 and 10 years experience with AEAs, and 9.2% respondents had no working experience with AEAs. The farmers' mean years of working experience with AEAs was 3.5.

Table 46. Farmers' Contact with AEAs

Years	Frequency	Percent	Cumulative %
Not yet	15	9.2	9.2
Less than 3	27	16.6	25.8
3-6	38	23.3	49.1
7-10	18	11.0	60.1
More than 10	65	39.9	100.0
Total	163	100.0	-

Mean = 3.5 years

Source: Field Data, 2003

4.4.4.1. Monthly Visits to Farmers by AEAs (as Perceived by Farmers)

The number of monthly visits to farmers by AEAs is presented in Table 47. The responses show differences in the total number of the visits that farmers received from the AEAs. Majority, 53.0% and 22.0% of the respondents had the AEAs visiting them once or twice, respectively in a month. The Table also shows that 13.4% of the respondents did not receive any visit from the AEAs.

Table 47. Monthly Visits to Farmers by Agricultural Extension Agents (AEAs).

Visits	Frequency	Percent	Cumulative %
No visit	22	13.4	13.4
Once	87	53.0	66.4
Twice	36	22.0	88.4
Thrice	3	1.8	90.2
Four or more	16	9.8	100.0
Total	164	100.0	-

Source: Field Data, 2003

AEAs visit farmers mainly to disseminate innovations on crops or livestock and also to observe whether such innovations are being adopted, and whether there are other farming problems which need to be solved with the farmers. Problems which cannot be solved by the AEAs are further passed on to their supervisors for discussions and solutions. Among others, the AEAs may also undertake a method demonstration or a result demonstration visit to teach farmers about how to carry out a practice or show them the result of an innovation.

The inference from Table 47 is that the AEAs' visits to farmers were woefully inadequate. A high percentage (66.4%)of the farmers either received AEAs' visits once or no visits at all during the month. This might be due to insufficient means of transport for AEAs, non-residence of AEAs in their operational areas because of accommodation problems or inadequate and irregular payments of travelling and transport claims. These problems were among those which were highlighted by the AEAs as being the most important factors that

limited their performance. The limiting factors need to be addressed by MOFA management to improve effective extension delivery.

4.4.5. Extension Policy and Funding of Programmes

The policy and funding of extension programmes were examined in the study. The DDAs and DDOs were asked to give their perceptions of adequacy and timely release of funds for extension programmes in the study area. All the DDAs and one-half the number of the DDOs indicated that funds released to the Districts for extension programmes were fairly adequate. Nine (45.0%) of the DDOs responded that the funds were inadequate. Four DDAs and seven DDOs, however, indicated that funds for extension programmers were released but not always on time. One DDA (20.0%) and 65.0% DDOs emphatically stated that the funds were not released on time (Tables 48 and 49). The two tables clearly show that funding of extension programmes need to be improved by MOFA since funds were neither adequate nor released on time for effective agricultural extension delivery.

Table 48. Perceptions of DDAs and DDOs of Adequacy of Funding for Extension Programmes.

Perceptions	District Directors (DDAs)		District Dev. Officers (DDOs)	
	Frequency	Percent	Frequency	Percent
Adequate	0	0.0	1	5.0
Fairly adequate	5	100.0	10	50.0
Inadequate	0	0.0	9	45.0
Total	5	100.0	20	100.0

Source: Field Data, 2003

Table 49. Perceptions of DDAs/DDOs of Timely Release of Funds for Extension Programmes

Perceptions	District Directors (DDAs)		District Dev. Officers (DDOs)	
	Frequency	Percent	Frequency	Percent
Yes	0	0.0	0	0.0
Not always	4	80.0	7	35.0
No	1	20.0	13	65.0
Total	5	100.0	20	100.0

Source: Field Date, 2003

4.4.6. Farmers' Participation in Planning of Extension Programmes

This section deals with planning of extension programmers in the study area. Extension education programmes are planned to effect desirable changes in the behaviour of farmers. Meier (1970) recognizes planning as the process, which controls the order of a sequence of operations to be performed. Planning is also a

managerial process of deciding in advance what is to be done, how it is to be done, when to do it and who is to do it.

4.4.6.1. Involvement of Farmers in Planning of Extension Programmes

The extent to which farmers participate in extension programme planning was assessed in the study. The results are presented in Table 50. The results show that the majority (92.1%) of the respondents found it important that farmers should be involved in the planning of extension programmes .The farmers sampled believed that they knew their problems and needs better. Some indicated that their involvement in the programming would help them endure the sustainability of such extension programmes. Only 3.6% respondents said that it was not important to involve farmers in extension programme planning (Table 50).

Table 50. Involvement of Farmers in Planning of Extension Programmes.

Years	Frequency	Percent	Cumulative %
Very important	117	71.9	71.9
Important	33	20.2	92.1
Somewhat important	7	4.3	96.4
Not important	3	1.8	98.2
Not at all important	3	1.8	100.0
Total	163	100.0	-

Source: Field Data, 2003

4.4.6.2. Extent of Farmers' Participation in Planning of Extension Programmes

The percentage of respondents who participated in planning of extension programmes was 64.9%. Occasionally, 18.7% of the respondents participated in planning of extension programmes. Low participation was observed from 16.4% respondents Table 51.

Table 51. Extent of Farmers' Participation in Planning Of Extension Programmes

Extent of participation	Frequency	Percent	Cumulative %
Very high	37	27.6	27.6
High	50	37.3	64.9
Occasionally	25	18.7	83.6
Low	14	10.4	94.0
Very low	8	6.0	100.0
Total	134	100.0	-

Source: field Data, 2003

It could be observed from Table 51 that 64.9% of the respondents were fully involved in planning. This situation is quite satisfactory and augurs well for successful extension programmes because when farmers are involved in planning of programmes, they see the programmes as theirs and they put in more efforts and support the programmes to succeed. Lele (1975) and Lance and Mckeena (1975) also expressed the view that people's participation in planning of programmes is essential for the success of the programme.

4.4.6.3. Farmers' Participation in Components of Planning of Extension Programmes

To examine the extent of farmer participation in extension programme planning, farmers were further asked to specify which activities of planning (as indicated in Table 52) they actually participated in. One hundred and two (61.4%) of the respondents participated in identification of problems and 51.8% respondents participated in the setting up of objectives. The result is quite satisfactory because identification of problems and setting up of objectives are very important in planning of extension programmes.

Table 52. Farmers' Participation in Components of Planning of Extension Programmes

Planning component	No. of farmers	Percent
Identification of problems	102	61.4
Prioritization of problems	83	50.0
Setting up of objectives	86	51.8
Review of objectives	75	45.2

N – 166 (Multiple responses)

Source: Field Data, 2003

4.4.7. Farmers' Participation in Implementation of Extension Programmes

Table 53 shows farmers' participation in some activities of implementation of extension programmes (by multiple responses). The table shows that most farmers (over 90.0%) participated in weeding farms, removed mistletoes on crops,

harvested crops, dried and sold farm produce. Other activities included insecticidal spraying, raising of seedlings, fungicidal spraying and acquiring farm inputs.

This is commendable since target beneficiary participation in implementation of programmes has been identified as one of the major problems in plan failures. Such failures often result from low involvement of the target beneficiary (Meier, 1970).

Table 53. Frequency Table of Farmers' Participation in Each Practice of Programme Implementation

Practices	Frequency	Percent
Acquiring farm inputs	97	58.4
Raising of seedling	125	75.3
Weeding of farms	157	94.6
Removal of mistletoes	153	92.2
Insecticidal spraying	134	80.7
Fungicidal spraying	98	59.0
Fertilizer application	138	83.1
Harvesting of produce	151	91.0
Drying of produce	155	93.4
Marketing of produce	160	96.4

N = 166 (multiple responses)

Source: Field Data, 2003

4.4.8. DDAs and DDOs Involvement in Planning

District Directors of Agriculture (DDAs) and District Development Officers (DDOs) in the study area were also asked to indicate their involvement in planning of extension programmes. The result is presented in Table 54.

Table 54. Involvement of District Directors (DDAs) of Agriculture and District Development Officer (DDOs) in Planning of Extension Programmes

Responses	DDAs Frequency	Percent	DDOs Frequency	Percent
Yes	1	20.0	12	60.0
Not always	2	40.0	5	25.0
No	2	40.0	3	15.0
Total	5	100.0	20	100.0

Source: Field Data, 2003

One DDA and 12 DDOs responded affirmatively that they were involved in the planning of extension programmes. The remaining 4 DDAs and 8 DDOs were not always or not involved in the planning. By not involving some DDAs and DDOs (immediate supervisors of AEAs) in planning of extension programmes, there would be defects and difficulties in the implementation of such programmes. This was a serious anomaly which needs to be rectified by MOFA management.

When asked to indicate the components of planning in which the DDAs and the DDOs participated in, the DDAs' overall participation was low (30.0%). However, the overall participation of the DDOs in all the components of planning was high (61.3%) (Table 55). This is quite encouraging since the DDOs are the

immediate supervisors of the AEAs who are to implement the extension programmes in the field.

Table 55. DDAs' and DDOs' Participation in Components of Planning

Planning Component	DDAs Frequency	Percent	DDOs Frequency	Percent
Identification of problems	2	40.0	12	60.0
Prioritization of problems	2	40.0	13	65.0
Setting up objectives	1	20.0	12	60.0
Review of objectives	1	20.0	12	60.0

N(DDAs) = 5 (Multiple responses) N (DDOs) = 20 (Multiple responses)

Source: Field Data, 2003

4.4.9 Logistical Support for AEAs

The study also examined logistical support to AEAs. Albrecht (1986) intimates that the best personnel of extension can only perform when the necessary

equipment is available and certain material conditions are fulfilled. It is the wish of extension managers that AEAs live and stay near their target groups to enable them (AEAs) work closely with the farmers. Inadequate accommodation can be a real cause of dissatisfaction of AEAs. Lack of accommodation can have a detrimental effect on extension work.

When asked to indicate the percentage of AEAs provided with accommodation in their operational areas by MOFA, the DDAs responded that only 26.7% had been provided with accommodation (Table 56).

The problem of transportation was also examined since inadequate transport can seriously impede the work of extension and provision of transport is one of the basic conditions for successful running of agricultural programmes. The DDAs further stated that 32.2% of the AEA respondents had been provided with motorbikes (Table 56)

Insufficient and non-payments of travelling and transport claims to AEAs were non-motivational. The Districts paid AEAs' claims monthly and sometimes, quarterly. These have been indicated by the AEAs as among the limiting factors in the performance of their duties.

Table 56. Logistical Support for AEAs

Logistics	No. of AEAS	Percent
Accommodation	24	26.7
Motor bikes	29	32.2
Monthly T & T Payment	54	60.0
Quarterly T & T Payment	36	40.0

N = 90 (Multiple responses)

Source: Field Data, 2003.

4.4.10 Extension Education Methods

Extension education methods play a very important role in the delivery of innovations to farmers. The methods used have influence on farmers' understanding and use of technologies.

AEAs were asked to indicate extension education methods which they frequently used. The results of the analysis are presented in Table 57. The table shows that 86.7% of the 90 respondents frequently used group discussions, followed by farm visits (85.6%) and home visits (72.2%). Method and result demonstrations were used by 65.6% and 41.1% of the respondents respectively. Field trips were the least method used by the AEAs. Discussions with some AEAs revealed that, even though the majority of the AEAs used the group discussion method frequently, they sometimes combined training methods in the delivery of the extension messages.

Table 57. Frequently used Agricultural Extension Education Methods by AEAs

Education Method	Frequency	Percent
Group discussion	78	86.7
Farm visits	77	85.7
Home visits	65	72.2
Method demonstration	59	65.6
Result demonstration	37	41.1
Field trip	19	21.1

N = 90 (Multiple responses)

Source: Field Data, 2003

4.4.10.1 Major Languages for Communication of AEAs with Farmers

The AEAs were further asked to state their major languages of communication with farmers. Major languages identified were Twi, English, Fante, Ewe, Ga and Sissala. Most (95.6%) of the respondents communicated with farmers in Twi and 42.2% in English (Table 58).

It is not surprising that over 95% of the AEAs communicated with the farmers in Twi language since the major language in the Ashanti Region is Twi .The AEAs therefore communicated freely with the farmers and the language could increase their (AEAs) competence in the areas.

Table 58. Major Languages for Communication of AEAs with Farmers

Language	Frequency	Percent
Twi	86	95.6
English	38	42.2
Fanti	8	8.9
Ewe	8	8.9
Ga	3	3.3
Sissala	1	1.1

N = 90 (Multiple responses)

Source: Field Data, 2003

To explore further, the AEAs were asked to indicate the average percentage of the farmers who normally contributed during group discussions. The majority (93.2%) of AEAs responded that between 20 and 80% of the farmers contributed during group discussions (Table 59). This is a healthy observation because group discussion extension method has the advantages of reaching a large number of farmers. It also fosters participation and saves time compared with individual methods (Albrecht, 1989).

Table 59. Average Percentage of Farmers Who Contribute During Group Discussions as Perceived by AEAs

Average (%)	Frequency	Percent	Cumulative %
Less than 20	2	2.3	2.3
20 – 40	22	25.0	27.3
41 – 60	36	40.9	68.2
61 – 80	24	27.3	95.5
Over 80	4	4.5	100.5
Total	88	100.0	-

Source: Field Data, 2003

4.4.10.2. Effectiveness of Extension Education Methods Used by AEAs

Farmers were asked to indicate their perceptions of extension education methods used by AEAs in terms of effectiveness. The results of the responses are presented in Table 60. Most of the respondents rated farm visits, group discussions and demonstrations as being effective in the dissemination of information. The mean scores for the methods were farm visit, (x=4.3), group discussion, (x=4.1), and method demonstration, (x=4.0). The least rated method was radio with a mean score of 3.3. Most (62.6%) of the respondents rated farm visit as the most effective because they had opportunity to ask practical questions in the field and also received ready answers.

Table 60. Effectiveness of Extension Education Methods Used by AEAs as Perceived by Farmers

Method	Effectiveness						
	5	4	3	2	1	Mean	SD
Farm visit	62.6	21.4	6.6	4.4	5.1	4.3088	1.1386
Group discussion	40.3	40.3	11.6	3.1	4.7	4.0853	1.0310
Method demonstration	37.8	42.6	9.4	7.1	3.1	4.0472	1.0224
Result demonstration	32.2	34.8	17.9	7.1	8.0	3.7500	1.2339
Home visit	33.6	30.4	20.8	7.2	8.0	3.7440	1.2241
Field trip	25.6	28.2	23.1	10.7	12.4	3.4380	1.3159
Radio	29.0	18.6	22.6	12.1	17.7	3.2903	1.4526

N=136 (Multiple response)

Scale of means were calculated from 5=Most effective, 4=Effective, 3=Quite effective, 2=Ineffective, 1=Very ineffective.

Source: Field Data, 2003.

4.4.11 Linkages between Research, Extension and Farmers

The DDAs, DDOs and the farmers were asked to indicate whether there were formal linkages and close working relationships among research- extension and farmers. Discussions with them revealed that relationships existed through the work of Research- Extension Liaison Committee (RELC) in the region (MOFA 2003). On the RELC, subject matter specialists, researchers, managers of regional research centres, regional development officers, regional agricultural extension officers and representatives of farmers function to review and assess the performance of various organizations involved in technology development and

delivery (MOFA, 2003). The RELC ensures that agricultural research in the region is farmer-relevant with well-proven technical messages.

The results of the survey also indicated that the Districts had more close working relationships with Crop Research Institute (C R I) and Cocoa Research Institute of Ghana (CRIG) than any other research institute (Table 61).The Districts also have relationships with the Soil Research Institute (SRI), the Faculties of Agriculture of KNUST, Legon and Cape Coast Universities. In addition to their representations on RELC, some farmers undertook field trips and farm visits to research stations. Farmers were also in constant touch with AEAs (Tables 61 and 62).

It was not surprising that there existed a high percentage of relationships between the Districts, CRIG and SRI because the two institutions are in the Ashanti Region, the study area. The Districts are therefore nearer to the research institutions than the others. The relationship between the Districts and the CRIG was also high, probably due to the unification of MOFA extension unit and that of the COCOBOD. Hitherto, the AEAs of MOFA had a close working relationship with all crops and livestock farmers except the cocoa farmers. After the unification, there was the need to update the knowledge on cocoa of the AEAs. That might have accounted for the high percentage of the relationships between the Districts and CRIG.

Table 61. Formal Linkages between Extension Work in Districts and Research Institutions as Perceived by DDAs and DDOs

Institution	DDAs		DDOs	
	Frequency	Percent	Frequency	Percent
Crop Research Institute (CRI)	5	100.0	17	85.0
Soil Research Institute (SRI)	3	60.0	13	65.0
Cocoa Research Institute (CRIG)	5	100.0	12	60.0
University of Ghana, Legon	1	20.0	8	40.0
KNUST, Kumasi	2	40.0	8	40.0
University of Cape Coast	2	40.0	1	5.0

N (DDA)=5 (Multiple responses) N (DDO)=20 (Multiple responses)

Source: Field Data, 2003

Table 62. Field Trips to Improved Farms and Research Stations By Farmers

Responses	Frequency	Percent
Yes	67	41.6
Not always	44	27.3
No	50	31.1
Total	161	100.0

Source: Field Data, 2003

4.4.12. Reliability and Extent of Satisfaction with Overall Performance of AEAs as Perceived by Farmers.

Generally, the AEAs in the study area assisted farmers to diagnose farming- related problems and advised them on solutions to such problems (MOFA, 2002). They also assisted the farmers to establish field demonstrations and assessed results with them. The AEAs arranged field days for contact groups and promoted the development of all women specific programmes. Information on availability of farm inputs, credit support and marketing was provided by the AEAs. Furthermore, the AEAs provided feedback from the farmers for management decision, and participated with researchers in the establishment of on-farm adaptive trials and also collected data for analysis by the researchers, among others.

The AEAs used group discussions, method and result demonstrations, farm and home visits to communicate with and educate the farmers. As perceived by farmers, the AEAs were reliable and they (farmers) were satisfied with their performance (Tables 63 and 64).

Table 63 shows that 73.2% of respondents said that the AEAs were reliable in the performance of their duties while 14.7% stated that the AEAs were not reliable. Some (12.1%) respondents perceived the AEAs as been quite reliable. The AEAs would therefore be freer and have easier communication with the farmers because majority of the farmers have confidence in them.

Table 63. Reliability of AEAs as Perceived by Farmers

Perception	Frequency	Percent	Cumulative %
Very reliable	66	42.0	42.0
Reliable	49	31.2	73.2
Quite reliable	19	12.1	85.3
Not reliable	14	8.9	94.2
Not at all reliable	9	5.8	100.0
Total	157	100.0	-

Source: Field Data, 2003

Furthermore, when the farmers were asked to indicate whether they were satisfied with the overall performance of the AEAs, the majority (74.4%) of the respondents stated that they were satisfied with the AEAs' performance while 13.7% responded that they were not satisfied with the AEAs performance (Table 64). The two variables, reliability and satisfaction, as perceived by the farmers, were high and therefore could enhance the AEAs' working relations with the farmers and improve the EOAED.

Table 64. Extent of Satisfaction with the Overall Performance of AEAs as Perceived by farmers

Farmer Perception	Frequency	Percent	Cumulative %
Very much satisfied	58	36.3	36.3
Satisfied	61	38.1	74.4
Quite satisfied	19	11.9	86.3
Not satisfied	22	13.7	100.0
Total	160	100.0	-

Source: Field Data, 2003.

4.4.13 Achievements of Targets for 2000 and 2001 Years

The District Directors of Agriculture (DDAs) were asked to provide figures for achievements of targets in their districts. Available figures showed that the overall percentage achievements for 2000 and 2001were 61.0% and 65.6% respectively.

Comparisons of achievements for individual targets are presented in Table 65. The table shows that the districts performed better in the year 2001 than in 2000 in all the targets set. In year 2000, the 74.7% percent achievement was highest for farm visit while livestock production accounted for the least percentage achievement (51.1%). Again in 2001, farm visit recorded the highest percentage achievement (76.1%) with the livestock production recording the least (60.3%). Percentage achievements for year 2002 were not available at the time of the survey. The achievements, especially for the farm visits, are commendable since farmers benefit immensely from such visits. Farmers' problems could be discussed and solved there and then in the field.

Table 65. Achievements of Targets for 2000 and 2001 Years

	Year 200 Percent	Year 2001 Percent
Farm visit	74.7	76.1
Crop production	61.4	66.4
Adopters of technology	60.3	64.3
Demonstrations	57.7	60.8
Livestock production	51.1	60.3

N (DDA) = 5 Mean (2000) = 61.0%, Mean (2001)=65.6

Source: Field Data, 2003

4.4.14 Difficulties in Selling Farm Produce by Farmers

One of the major constraints perceived by farmers was marketing problems such as unavailability of markets, unstable prices and perishability of some produce. When the farmers were asked to state whether they had difficulty in selling their farm produce, the majority (58.5%) of them responded negatively while 41.5% indicated they had difficulty (Table 66). The problems could be due to unavailability of markets, unstable prices or perishability of produce.

Table 66. Difficulties in Selling Farm Produce by Farmers

Response	Frequency	Percent
Yes	68	41.5
No	96	58.5
Total	164	100.0

Source: Field Data, 2003

Some duties of the AEAs were to provide information on availability of farm inputs, to assist farmers in the diagnosis of farm and farming –related problems and to advise on solutions to such problems. The AEAs also provided feedback from farmers for management decision (MOFA, 2002).

To solve the problem of the unavailability of markets and to assist the farmers in the marketing of their produce, the AEAs indicated that they informed and discussed the problem with their DDOs. They usually organized middlemen from the district headquarters to purchase the produce. The government through the District Assemblies intermittently intervened and constructed emergency feeder roads to the remote and affected areas to ease transportation and evacuation of the produce to market centres.

With the problem of unstable prices, especially when there was a glut of farm produce on the markets, the AEAs, the DDOs and the DDAs discussed the glut problems and informed the Ghana Food Corporation to purchase some of the farm produce for storage to indirectly stabilize the market prices.

To forestall perishability of farm produce, feeder roads were constructed or improved by the District Assemblies during the off-season to ease transportation and evacuation of the farm produce during the harvest season. The AEAs also educated the farmers on storage facilities before the peak season. Difficulties in selling produce could adversely affect the EOAED.

4.4.15. Distances from Villages to Market Centres

Responses to a further question as to the distances the farmers had to travel from their villages to market centres revealed that most (72.0%) respondents travelled less than 16km while 25.6% travelled 16-64km to sell their farm produce.

Only 2.4% of the respondents travelled over 64km to sell their produce. The mean distance that farmers had to travel to the market centre was 2.4km (Table 67). The major marketing problems need to be addressed by the MOFA to encourage the farmers.

Table 67. Distances from Villages of Farmers to Market Centres

Distances (km)	Frequency	Percent	Cumulative %
Less than 16	118	72.0	72.0
16-32	25	15.2	87.2
33-48	10	6.1	93.3
49-64	7	4.3	97.6
Over 64	4	2.4	100.0
Total	164	100.0	-

Mean = 2.4 km.

Source: Field Date, 2003

4.4.16. The EOAED and Professional Competence and Motivation of AEAs

Pearson product-moment correlation analysis was done to determine whether relationships existed between the EOAED and level of competence of agricultural extension agents (AEAs), their perceived job satisfactions, recognition and their working conditions of service. The relationship between EOAED and AEAs' perception of promotion as well as their level of salaries was also determined. The results showed that the EOAED correlated significantly and positively with three variables. They were: the level of competence (r = .168); job satisfaction (r = .265); and recognition of AEAs (r = .157). There was also a

significant correlation between the EOAED and contributions of farmers during group discussions. The relationships between EOAED and working conditions of AEAs (r = .080), promotion (r = .092) and level of salaries of AEAs (r = .081) were not significant statistically at the 0.05 alpha level. However, their relationships with the EOAED were positive and negligible.

The implications are that the MOFA must show concern and interest in the level of competence and job satisfaction of agricultural extension agents (AEAs), motivate and encourage them to perform creditably. The MOFA must also be guided by all the variables investigated in Table 68 since they all correlated positively with the EOAED in the study area

Table 68. **Relationships between EOAED and Level of Competence of AEAs, Job Satisfaction, Recognition, Working Conditions, Perceived Promotion, the Level of Salaries of AEAs and Contribution of Farmers During Group Discussions .**

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
X_1	1.000							
X_2	.168*	1.000						
X_3	.265**	.456	1.000					
X_4	.157*	.494**	.616**	1.000				
X_5	.080	.280**	.572**	.612**	1.000			
X_6	.092	.003	.251*	.226	.480	1.000		
X_7	.081	.146	.462**	.360	.736**	.571**	1.000	
X_8	.361**	.137	.172*	.080	.053	.000	.000	1.000.

X_1 = Effectiveness of agricultural extension delivery (EOAED).

X_2 = Level of competence of AEAs

X_3 = Job satisfaction of AEAs

X_4 = Recognition of AEAs

X_5 = Working conditions of AEAs

X_6 = Perceived promotion of AEAs

X_7 = Level of salaries of AEAs.

X_8 = Contributions of Farmers During Group Discussions

Source: Field Date, 2003

4.4.17. Relationships between EOAED and Farmers Involvement in Planning of Extension Programmes, Working Experience with Extension, Number of Monthly Visits to Farmers By AEAs and Difficulty in Selling Farm Produce.

Table 69 shows the Pearson product-moment correlation co-efficients for relationships between EOAED and farmer involvement in planning of extension, farmer working experience with extension, number of monthly visits to farmers by AEAs, difficulty encountered by farmers in selling farm produce.

The results indicated positive and moderate relationships between EOAED and farmer farming experience with extension (r = .414), the number of monthly working visits to farmers by AEAs (r = .367) and difficulty encountered by farmers in selling their farm produce (r=.174). Statistically, the observed relationship between EOAED and farmer involvement in planning extension programmes was positive(r = .029) but negligible.

The positive significant relationships would suggest that efforts at improving EOAED must ensure that agricultural extension agents (AEAs) increase their visits to farmers and MOFA would also evolve a pragmatic policy, and work to stabilize prices of farm produce.

Table 69. Relationships between EOAED and Farmer Involvement in Planning, Farmers' Working Experience with Extensions, AEAs' Monthly Visits to Farmers and Difficulty in Selling Farm Produce.

	X_1	X_2	X_3	X_4	X_5
X_1	1.000				
X_2	.029	1.000			
X_3	.414**	-.136	1.000		
X_4	.367**	-168*	.412**	1.000	
X_5	.174**	.196*	-.105	-.041	1.000

X_1 = Effectiveness of agricultural extension delivery

X_2 = Planning of extension programmes

X_3 = Farmers farming experience with Extension

X_4 = No of monthly visits to farmers by Agricultural extension agents (AEAs)

X_5 = Difficulty in selling farm produce as perceived by farmers

Source: Field Data, 2003

4.4.18. Relationships between EOAED and Extension Education Methods

Furthermore, the relationship between EOAED and the effectiveness of education methods (as perceived by farmers) were investigated, using correlational analysis. The agricultural extension methods studied were group discussion, method and result demonstrations, farm and home visits, field trip and radio.

From the results of the scores of farmers, there were substantial relationship between EOAED and method demonstration (r = .508) and farm visit (r = .510). A moderate relationship (r =.488) was also observed between EOAED and group discussion. The correlation observed between radio and EOAED was negative. The

table also shows positive, moderate and low relationships between EOAED and field trip (r = .301), home visit (r = .275) respectively (Table 70).

Table 70. The Relationships between the EOAED and Agricultural – Extension Education Methods as Perceived by farmers.

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
X_1	1.000							
X_2	.488**	1.000						
X_3.	.508**	.609**	1.000					
X_4	.478**	.449**	.672**	1000*				
X_5	.510**	.497**	.625**	.469**	1.000			
X_6	.275	.054	.020	.000	.000	1.000		
X_7	.301*	.580**	.654**	.526**	.473**	.237*	1.000	
X_8	-.2000	.156	.138	.337**	.115	.057	.318**	1.000

X_1 = Effectiveness of agricultural extension delivery (EOAED)

X_2 = Group discussion

X_3 = Method demonstration

X_4 = Result demonstration

X_5 = Farm visit

X_6 = Home visit

X_7 = Field trip

X_8 = Radio.

Source: Field Data, 2003

4.5 TECHNOLOGICAL CHARACTERISTICS

Objective 4 of the study examined characteristics of technologies from farmers' point of view in terms of the overall relative advantage, compatibility, complexity, trialability and observability. The results of the responses are presented in Tables 71-76. Relationships between EOAED and the technological characteristics were also assessed.

4.5.1 Relative Advantage of Recommended Practices

The overall relative advantage of recommended practices as perceived by the majority of farmers was high. Eighteen (11.5%) of the respondents also indicated it was moderate while 5.2% of them did state that the practices had no relative advantages over the previously known practices (Table 71). The results show that the farmers appreciate and acknowledge the effects and advantages of the recommended practices. Adams (1990) notes that the more tangible the benefits of an innovation, the more farmers may be willing to adopt.

Table 71. Overall Relative Advantage of Recommended Practices as Perceived By Farmers

Perception	Frequency	Percent	Cumulative %
Very High	71	45.5	45.5
High	59	37.8	83.3
Moderate	18	11.5	94.8
Low	-	-	94.8
No relative advantage	8	5.2	100.0
Total	156	100.0	-

Source: Field Data, 2003

4.5.2 Compatibility of Recommended Practices

When asked to indicate the compatibility of the recommended practice to them, 69.8% of the respondents stated that the practices were either very highly or highly compatible while 1.2% responded that the practices were not compatible. Twelve (7.4%) of the farmers could not decide (Table 72). The high percentage of compatibility perceived by the respondents shows that the recommended practices were consistent with the farmers' values and did not conflict with their previous known practices.

Table 72. Compatibility of Recommended Practices as Perceived by Farmers

Compatible	Frequency	Percent	Cumulative %
Very highly compatible	47	29.0	29.0
Highly compatible	66	40.8	69.8
Quite compatible	35	21.6	91.4
Not compatible	1	0.6	92.0
Not at all compatible	1	0.6	92.6
Cannot say/tell	12	7.4	100.0
Total	162	100.0	-

Source: Field Data, 2003

4.5.3 Complexity of Recommended Practices

The farmers were also asked to rate the use of the overall recommend practices, whether the practices were easy or difficult to apply. Ninety-eight, constituting 60.8% of the farmers responded that the overall recommended practices were either very easy or easy to apply while 10.6% also indicated that the practices were quite easy. However, 19.9% of the respondents found the practices difficult to use .The remaining 8.7% were undecided and did not say whether the practices were easy or difficult to apply (Table 73).

Table 73. Complexity of Application of Overall Recommended Practices as Perceived by Farmers

Perception	Frequency	Percent	Cumulative %
Very easy to apply	59	36.6	36.6
Easy	39	24.2	60.8
Quite easy	17	10.6	71.4
Difficult	31	19.3	90.7
Very difficult	1	0.6	91.3
Cannot say / tell	14	8.7	100.0
Total	161	100.0	-

Source: Field Data, 2003

The table showed that more farmers applied the recommended practices because the practices were either very easy or easy (all things being equal). It follows that the more complex an innovation is the more difficult it is for farmers to adopt (Rogers, 1983). There is therefore the need for researchers to ensure that their efforts and research are always farmer-driven.

4.5.4 Trialability of Recommended Practices

The farmers were further asked to state whether they tried the recommended practices first on a small scale on their farms before adopting them on a large one. One hundred and six (66.3%) of the farmers responded affirmatively (Table 74). By trying the innovations on a small scale before adopting them on a large scale, great risks would be reduced (Adams, 1990)

Table 74. Trialability of recommended Practices on Small Scale before Adoption on Large Scale

Responses	Frequency	Percent
Yes	106	66.3
No	54	33.7
Total	160	100.0

Source: Field Data, 2003

4.5.5 Observability of Recommended Practices

Further, farmers' points of view on the observability of the recommended practices were sought in the study area. That is, the degree to which the results of an innovation is visible to farmers (Adams, 1990). The results showed that 82.1% of the farmers responded affirmatively while 10.7% stated that the practices were quite observable on their farms. Only 7.2% respondents indicated that the results of the recommended practices were not visible on their farms (Table 75).

The results show that the effects of recommended practices were visible and observable on most farmers' farms. The farmers would therefore adopt the innovations if the effects of the recommended innovations had relative advantages and were beneficial to them.

Table 75. Observability of Overall Recommended Practices on Farms as Perceived By Farmers

Perception	Frequency	Percent	Cumulative %
Highly Observable	77	54.8	54.8
Observable	38	27.3	82.1
Quite Observable	14	10.7	92.8
Not observable	10	7.2	100.0
Total	139	100.0	-

Source: Field Data, 2003

4.5.6 Relationships between EOAED and the Technological Characteristics of Recommended Practices

Pearson Product-moment correlation co-efficients showing relationships between EOAED and technological characteristics of recommended practices are presented in Table 76. The results indicated substantial and moderate relationships between EOAED and compatibility (r =.679) and complexity (r =.290) of recommended practices respectively. The substantial and positive relationships between the EOAED and the compatibility and complexity of recommended practices indicated that compatibility and complexity of the recommended practices have effects on adoption of innovations by farmers, and also influence the EOAED. This supports Adams (1990) assertions that the more compatible and easy-to-apply an innovation is to farmers, the more the farmers may be willing to adopt. There were also correlations between EOAED and trialability and observability of recommended practices at the 0.05 alpha level (Table 76).

The correlations of the EOAED and the variables have amply shown that researchers and extension staff must pay attention to the relative advantages, compatibility and other technological characteristics of technologies to improve the adoption rates and the EOAED.

Table76. **Relationships between the EOAED and Compatibility, Complexity and Trialability of Recommended Practices, Farmers' Satisfaction with Performance of AEAs, Observability and Relative Advantage of Recommended Practices.**

	X_1	X_2	X_3	X_4	X_5	X_6	X_7
X_1	1.000						
X_2	.679**	.1.000					
X_3	.290*	.263**	1.000				
X_4	.020	-.037	.161*	1.000			
X_5	.637**	384**	.191	.229	1.000		
X_6	.264*	.486**	.177*	.069	.458**	1.000	
X_7	.449**	.511**	-145	.098	.475**	.485**	1.000

X_1 = Effectiveness of agricultural extension delivery (EOAED)

X_2 = Compatibility of recommended practices.

X_3 = Complexity of recommended practices

X_4 = Trialability of recommended practices.

X_5 = satisfaction with performance of AEAs.

X_6= Observability of recommended practices

X_7= Relative advantage of recommended practices

Source: Field Data, 2003

4.6 THE OVERALL EFFECTIVENESS OF AGRICULTURAL EXTENSION DELIVERY (EOAED)

Objective 5 of the study determined farmers' and AEAs' perceptions of the overall effectiveness of the agricultural extension delivery in the study area.

4.6.1 The EOAED from Farmers' Perspective

Means and standard deviations were computed to show the overall effectiveness of the agricultural extension delivery; and analysis of variance (ANOVA) was used to compare the perceived level of effectiveness among districts in the study area. The results are presented in Tables 77 and 78.

The results show that the overall effectiveness of the extension delivery (EOAED) in the study area (as perceived by farmers) was generally low and ineffective (x=2.1425, SD=1.0503). Each district also had a low mean level of effectiveness of the extension delivery.

Table 77. **Level of Effectiveness of Agricultural Extension Delivery As Perceived By Farmers**

District	Farmers	Mean	Std. Deviation
Atwima	32	2.6252	1.2115
Adansi East	30	2.5714	1.2599
Ahafo-Ano North	32	2.1563	1.1943
Asante Akim North	34	1.8286	0.7065
Sekyere West	32	1.5313	0.8793
	N=160	Mean=2.1425	SD=1.0503

The means were calculated from Likert Scale: 5 = Very effective, 4 = Effective, 3 = Moderately/fairly effective, 2 = Ineffective, 1 = Very ineffective

Source: Field Data, 2003.

4.6.2 The ANOVA and Multiple Comparisons of the EOAED in the Districts (Farmers' Perspective)

The result of the analysis of variance (ANOVA) is presented in Table 78. It was significant at 0.05% alpha level. Comparisons made revealed significant mean differences among some districts in the area (Table 79).

Between Atwima District and Sekyere West, Asante Akim North, or Ahafo Ano North District, the mean differences were significant. However, between Atwima and Adansi East District, the mean difference was not significant at the 0.05 alpha level. The inference is that the agricultural extension delivery in Atwima District was more effective than in the three districts, Sekyere West, Asante Akim North and Ahafo-Ano North. The mean difference observed between Atwima and the Adansi East was not significant at the 0.05 alpha level.

There was also a significant mean difference between Sekyere West and Ahafo-Ano North districts. Between Asante Akim North and Adansi East districts, the mean difference was also significant. No significant mean difference was, however, observed between Ahafo-Ano North and Adansi East districts at the 0.05 alpha levels (Table 79).

Table 78. Analysis of Variance (Anova) For Level of Effectiveness of Agricultural Extension Delivery (as Perceived by Farmers)

	Sum of Squares	Degree of Freedom	Mean Square	F	Sig.
Between Groups	27.968	4	6.922	6.204	0.005
Within groups	173.516	154	1.204		
Total	201.484	158			

Significant at 0.05 alpha level

Source: Field Data, 2003

Table 79. **Multiple Comparisons of Level of Effectiveness for Districts (LSD)**

District (A)	District (B)	A-B	Std. Deviation	Sig.
Atwima	Sekyere West	1.0938*	0.2654	0.020
	Asante Akim North	0.7964*	0.2596	0.003
	Ahafo-Ano North	0.4688*	0.2654	0.020
	Adansi East	0.0536	0.2747	0.846
Sekyere West	Asante Akim North	-0.2973	0.2596	0.254
	Ahafo-Ano North	-0.6250*	0.2654	0.020
	Adansi East	-1.0402	0.2747	0.133
Asante Akim	Ahafo-Ano North	-0.3277	0.2596	0.209
North	Adansi East	-0.7429*	0.2691	0.006
Ahafo-Ano North.	Adansi East	-0.4152	0.2747	0.133

The mean difference is significant at the 0.05 level

4.6.3 The Level of EOAED (from AEAs' Perspective)

The levels of effectiveness of agricultural extension delivery as perceived by AEAs in the districts were also examined. The results are presented in Table 80. Generally, the AEAs perceived the effectiveness of agricultural extension delivery as quite or moderately effective (X 3.5196, SD = 0.4991). The standard deviation (SD) values of less than 1.0 in all the districts studied indicated consistency in agreement among the AEAs with the reported levels of effectiveness of agricultural extension delivery. The mean level of effectiveness of agricultural extension delivery in Atwima District was higher (x = 3.5902) than it was in any of

the remaining four districts, (Ashanti Akim North, Sekyere West, Adansi East and Ahafo-Ano North).

Table 80. Level of Effectiveness of Agricultural Extension Delivery (EOAED) as perceived by AEAs

District	No. of AEAS	Mean	Std. Deviation
Atwima	19	3.5902	0.4350
Asante Akim North	18	3.5238	0.3795
Sekyere West	19	3.5188	0.4551
Adansi East	18	3.5079	0.6006
Ahafo -Ano North	15	3.4571	0.6255

N=89

Scale used, 5 = Very effective, 4 =Effective, 3 = Quite effective, 2= ineffective, 1 = Very ineffective

Source: Field Data, 2003.

4.6.4 The Analysis of Variance (ANOVA) from AEAs' Perspective

To determine whether the mean differences in the EOAED as perceived by the AEAs were significant among the districts at 0.05 alpha level, an analysis of variance (ANOVA) was computed (Table 81). No significant differences were observed among the districts in the EOAED. It indicates therefore that there were either no or negligible disparity in the effectiveness of performance of duties by AEAs in the districts. The scale used for rating the effectiveness was 5= Very effective, 4.0= Effective, 3.0= Quite effective, 2.0= Ineffective, 1.0= Very ineffective.

Table 81. ANOVA for Levels of Effectiveness of Agricultural Extension Delivery as Perceived by AEAs.

	Sum of Squares	d f	Mean Square	F	Sig.
Between groups	0.155	4	0.0388	0.154	0.961
Within groups	21.192	84	0.2523		
Total	21.347	88			

Source: Field Data, 2003

4.7 FARMERS' AND AEAs' PERCEIVED PROBLEMS ASSOCIATED WITH EXTENSION DELIVERY

Objective 6 sought to identify farmers and AEAs' perceived problems associated with agricultural extension delivery in the region. Table 82 shows the major constraints in farming activities which directly or indirectly affect extension delivery in the region. Farmers' recommendations for improving the effectiveness of the extension delivery are also presented in Table 83.

4.7.1 Farmers' Perceived Problems

The analysis of the results in Table 82 shows that most (78.7%) of the respondents indicated that scarcity and high cost of farm inputs were the greatest constraints in their farming activities; followed by lack of credit facilities and high interest rates charged on loans. Other major constraints, in order of importance, were supply and high cost of labour and marketing problems, including lack of markets for farm produce, transport and transportation of produce, unstable prices and perishability of some produce.

Table 82. Major Constraints Affecting Farming Activities as Perceived by Farmers

Constrains	Frequency	Percent
Scarcity and high cost of farm inputs	118	78.7
Lack of credit facility and high interest rate	112	74.7
Supply and high cost of labour	101	67.3
Marketing problems (lack of markets, Unstable prices and produce perishability)	24	16.0
Vagary and poor weather conditions	23	15.3
Pests and diseases	13	8.7
Insufficient and irregular visits by AEAs	12	8.0

N= 150 (Multiple responses)

Source: Field Data, 2003

4.7.2 Farmers' Recommendations for Improving the EOAED

The farmers made eleven recommendations for improving the effectiveness of the agricultural extension delivery in the region (Table 83). The first three of the recommendations, in order of importance, were provision of credit facilities and soft loans to farmers, means of transport and regular visits by AEAs to farmers, supply of farm inputs and re-introduction of subsidy on the inputs. The three recommendations were made by between 64.6%, 63.9% and 62.7% of the respondents respectively. Therefore, for effectiveness of agricultural extension delivery, the major constraints of the farmers need to be addressed and the recommendations seriously considered by the MOFA.

Table 83. Farmers' Recommendations for Improving the Effectiveness of Agricultural Extension Delivery

Recommendation	Frequency	Percent
Credit facility and soft loan to farmers	102	64.6
Means of transport and regular visits by AEAs	101	63.9
Supply of inputs and re- introduction of subsidy on inputs	99	62.7
Increase in number and training of AEAs	89	56.3
Adequate logistics to AEAs	77	48.7
Improvement of AEAs' conditions of service	76	48.1
Establishment of District labour pool	73	46.2
More demonstrations and field trips	71	44.9
Construction of storage facilities	68	43.0
Fixing of stable prices of farm produce	62	39.2
Establishment of District farm input stores	59	37.3

N= 158 (Multiple responses)

Source: Field Data, 2003

4.7.3. The Most Important Factors Limiting the Performance of AEAs

Problems associated with agricultural extension delivery as perceived by AEAs were also identified in the study. The results of the analyses are presented in Table 84. Of the 90 AEAs who responded, majority (61.1%, 56.7%, and 51.1%) of the respondents indicated that insufficient means of transport, insufficient and irregular payments of travelling and transport claims and inadequate supply of logistics for AEAs were the most important factors that limited the performance of AEAs

(Tables 84) respectively. In addition to the three factors, poor and low salary and delays in the promotion of AEAs were also identified by 45.6% and 20.0% respondents. The least limiting factor in the performance of the AEAs was insufficient maintenance allowances paid to AEAs (Table 84).

Table 84. Most Important Factors Limiting the Performance of AEAs as Perceived by AEAs

	Frequency	Percent
Insufficient means and strong transport	55	61.1
Insufficient and irregular payments of T&T claims	51	56.7
Inadequate supply of logistics	46	51.1
Poor and low salary of AEAs	41	45.6
Delays in promotion	18	20.0
Lack of accommodation in operational areas	14	15.6
Infrequent organization of seminars/workshops	12	13.3
Large areas of operation to AEAs	9	10.0
Insufficient maintenance allowance for motor-bikes of AEAs	5	5.6

N=90 (Multiple Responses)

Source: Field Data, 2003

4.7.4 Suggestions for Improving the Performance of AEAs by AEAs

Suggestions made by the AEAs for improving their performance are indicated in Table 85. Of the 90 respondents, 61.1% and 60.0% of them suggested that they should be given adequate allowances with regular payments and

sufficient means of transport respectively. Other suggestions made were improved salary and conditions of service, and provision of AEAs with accommodation at the operational areas. Each suggestion was made by between 32.2% and 23.3% of the respondents respectively. Less than 10.0% of the respondents suggested that more AEAs should be recruited as well as opening of more extension outlets to enable them pay regular visits to farmers.

Table 85. Suggestions for Improving the Performance of AEAs by AEAs

Suggestions	Frequency	Percent
Adequate allowances and regular payments	55	61.1
Provision of sufficient means of transport	54	60.0
Improved salary and conditions of service	29	32.2
Accommodation for AEAs at operational areas	21	23.3
Regular organization of seminars /workshops	15	16.6
More recruitment of AEAs and more extension outlets	3	3.3

N = 90 (Multiple Responses)

Source: Field Data, 2003

4.7.5 Recommendations for Improving the EOAED in the Ashanti Region by AEAs

To improve the effectiveness of agricultural extension delivery in the Ashanti Region, fourteen recommendations were made by the AEAs (Table 86) Among them were sufficient and timely supply of logistics to AEAs, frequent organizations of seminars and workshops for the AEAs and provision of sufficient and durable means of transport. These recommendations were made by 38.8%,

25.9% and 24.7% of the respondents respectively. Other recommendations are also indicated in Table 86. It is important to observe that over 63.0% of the recommendations made by farmers were among those made by the AEAs (Tables 83 and 86). This shows that there existed a close-working relationship between the farmers and the AEAs .The recommendations therefore need to be seriously considered by MOFA.

Table 86. Recommendations for Improving the Effectiveness of Agricultural Extension Delivery in the Ashanti Region by AEAs

Recommendations	Frequency	Percent
Sufficient and timely supply of logistic to AEAs	33	38.8
Frequent organizations of seminars and workshops for AEAs	22	25.9
Provision of sufficient and durable means of transport to AEAs	21	24.7
Adequate and regular payments of allowances including T&T claims to AEAs	15	17.6
Regular promotion of extension staff	10	11.8
More recruitment of AEAs and increase number of extension outlets	8	9.4
More result demonstrations and field trips with farmers	7	8.2
Effective super vision by Directorate	6	7.1
Provision of AEAs with accommodation at the outlets centers	6	7.1
Regular and timely supply of farm inputs to farmers	5	5.9
Improvement of feeder roads	4	4.7
Re-introduction of subsidy on farm inputs	3	3.5
Loans and credit facilities to farmers	2	2.4
Effective organization of markets for farm produce	2	2.4

N=90 (Multiple Responses).

Source: Field Data, 2003.

4.8 PREDICTOR VARIABLES OF EOAED IN ASHANTI REGION

This section (4.8) discusses the results of standard multiple regression analysis. Pallant (2001) states that it is the most commonly used multiple regression analysis.

4.8.1 Predictor Variables of EOAED (Farmers' Perspective)

The result of the standard multiple regression analysis showed an R^2 of .721 (72.1) and adjusted R^2 of .521 (52.1%) (Table 87). The model (which includes total compatibility of recommended practices as perceived by farmers, total farmers' satisfaction with the performance of AEAs and total result demonstrations) explained 52.1% of the variance in EOAED. The table further shows that all the three best predictors of the variance in the EOAED made unique and statistically significant contributions to the prediction of the EOAED (Table 87, coefficients). Of the three variables, total compatibility of recommended practices (as perceived by the farmers) made the largest and strong unique contribution (β = .393) to explaining the EOAED, followed by farmers' satisfaction with AEAs' performance (β = .347) and result demonstration (β = -.260). The ANOVA (Table 87) showed significance value of .000, indicating that the result of the model reached statistical significance level of 0.05 alpha level.

Table 87. The Standard Multiple Regression of Variables Affecting Effectiveness of Agricultural Extension Delivery (EOAED) as Perceived by Farmers.

Model summary of standard multiple regression

Model	R	R2	Adjusted R2	Std. Error of Estimate
1	.849	.721	.521	.7016

a) Predictors: (constant), Total Compatibility, Total Farmers' Satisfaction of AEAs' Performance, Total Result Demonstration.

Dependent variable: Total effectiveness of agricultural extension delivery (EOAED).

ANOVA of Standard Multiple Regression

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	58.560	33	1.775	3.605	.000
Residual	22.640	46	.492		
Total	81.200	79			

(a) Predicators: (constant), Total Compatibility, Total Farmer Satisfaction, Total Result Demonstration.

(b) Dependent variable: Total effectiveness of agricultural extension delivery.

Co-efficient of Standard Multiple Regression

Model	Std. Co-efficient Beta	t	Sig.
1(Constant)		.145	.885
Total Compatibility	.393	2.075	.044
Total farmer satisfaction	.347	.405	.020
Total result Demonstration	-.260	2.018	.043

Dependent variable: Total effectiveness of agricultural extension delivery.

Source: Field Data, 2003.

4.8.2 Predictor Variables of EOAED (AEAs' Perspective)

The results of the standard multiple regression analysis run from the scores of the AEAs also showed that only two variables explained .112 (11.2%) of the variance in the EOAED. These were total job satisfaction of AEAs and total contributions of farmers during group discussions as perceived by AEAs. The R^2 and adjusted R^2 were .277 (27.2%) and .112 (11.2%).

The table further shows that the best predictors uniquely and significantly made contributions to the predictions of the variance in the EOAED (Table 88, coefficients). Of the two best predictors, job satisfaction made slightly better unique prediction (β = .265) than the farmers' contributions during group discussions (β = .261).

The implication from the results is that the 11.2% of the variance in EOAED accounted for by the best predictors was small. There may be other important variables that were not included in the study in respect of the agricultural extension agents (AEAs).

Table 88. The Standard Multiple Regression of Variables Affecting Effectiveness of Agricultural Extension Delivery (EOAED) as Perceived by AEAs.

Model summary of standard multiple regression

Model	R	R2	Adjusted R2	Std. Error of Estimate
1	.526	.277	.112	.9154

a) Predictors: (constant), Total job satisfaction, Total f contribution.

Dependent variable: Total effectiveness of agricultural extension delivery (EOAED).

ANOVA of standard multiple regression

Model		Sum of Square	df	Mean square	F	Sig.
1	Regression	2.348	2	1.174	5.46	.023
	Residual	31.853	148	.215		
	Total	34.201	150			

(a) Predictors: (constant), Total job satisfaction, Total f contribution.

Dependent variable: Total effectiveness of agricultural extension delivery (EOAED).

Coefficients of standard multiple regression

Model		Standardized co-efficient, Beta	t	Sig.
1	(constant)		8.771	.000
	Job satisfaction	.265	2.559	.012
	Contribution	.261	2.111	.039

Dependent variable: Total effectiveness of agricultural extension delivery (EOAED).

Source: Field Data, 2003

To conclude the discussions on the regression results, it is worthy to note that the perceptions of farmers have revealed that compatibility of recommended practices to farmers, farmers' satisfaction with the performance of AEAs and result demonstrations were the best predictors of EOAED while those perceived by AEAs as best predictors were job satisfaction and contributions of farmers during group discussions. It is therefore important for researchers and the MOFA to be guided by these best predictor variables for EOAED in the Ashanti Region.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL OVERVIEW

This chapter presents the summary of the study, conclusions and recommendations. Suggested areas for further studies have also been indicated.

5.2 SUMMARY

The agricultural sector is by far, the largest sector of Ghana's economy. The sector contributes about 40.5% of the country's Gross Domestic Product (G.D.P.) and 38.6% of foreign exchange earnings (MOFA, 2003).

Agricultural extension delivery in the country has often been criticized and blamed for being one of the causes of low production and yields. Ashanti Region is no exception to this perception of the public that the agricultural extension delivery is ineffective in the country. This study therefore was an attempt to examine factors that affect the effectiveness of agricultural extension delivery in the Ashanti Region.

Specifically, the study was directed by the following objectives:

1. To find out the i) sex, ii) age, iii) levels of education and iv) working experience of farmers and AEAs of the Ministry of Food and Agriculture (MOFA) and their effects on agricultural extension delivery in the Ashanti Region.
2. To examine agro-enterprises of farmers.
3. To assess human resources management factors in respect of professional competence and motivation,

4. To examine extension information delivery and support factors,
5. To examine characteristics of technologies from the point of view of farmers,
6. To determine perceptions of farmers and AEAs of the overall effectiveness of agricultural extension delivery (EOAED).
7. To identify problems associated with EOAED as perceived by farmers and AEAs.
8. To determine relationships between the following variables and EOAED:
    - Demographic characteristics of farmers and AEAs.
    - Variables of agro-enterprises of farmers;
    - Profession competence and motivation of AEAs ;
    - Variables of extension information delivery and support factors ;
    - Characteristics of technologies from the point of view of farmers;
9. To identify the best predictors of EOAED from the independent variables of the study.

Descriptive statistics involving measures of central tendency, frequencies and percentage distributions were computed to describe farmers and AEAs on the variables of the study.

Majority (81.1%) of the respondents were males and 18.9% were females. Their mean age was 55.8 years but most of them were 48 and 65 years old. Only one respondent was below 30 years. According to the results, 32.9% of the respondents had no formal education and 53.0% possessed Middle School Leaving Certificates. Only one (0.6%) respondent possessed B.Sc. (Agriculture) certificate. The working experiences of farmers ranged from one to 65 years with a mean working experience of 26.3 years.

Statistically, the results of the study revealed no significant relationships between the EOAED and all the demographic characteristics of the respondents. However the EOAED correlated with age (r= -.032), level of education (r=. 088) and working experience of farmers (r=. 034). Using the Davis convention the associations were negligible.

Ninety AEAs were also surveyed in the study; 90.0% of them were males and 10.0% were females. Their ages ranged between 21 and 60 years with a mean age of 38.9 years. The highest and lowest educational qualifications of the AEAs were B.Sc. (Agriculture) and Middle School Leaving Certificates respectively. Of the total respondents, 81.9% of the AEAs possessed Certificate in General Agriculture. At time of the survey, the AEAs had worked between one and twenty eight years with a mean working experience of twelve years.

A correlational analysis was also done to find out whether there were correlations between EOAED and the demographic characteristics of AEAs. The results showed that there were relationships between EOAED and the age, level of education and working experience of AEAs. However, the relationship between the EOAED and the age of the AEAs was negative.

Objective 2 dealt with the farmers' modes of land acquisition, access to and cost of labour and sources of capital for farming in the study area. Four sources of land acquisition identified for farming were family lands, purchased lands, share-cropping and leasehold. Most (92.4%) of the respondents established their farms on family lands, on share-cropping basis and purchased lands with their personal savings and assistance from money lenders. Only 7.6% of the respondents held lands on leasehold. Majority (72.7%) of the respondents depended on hired and family labour for faming operations. There was a wide range of cost of hired

labour per manday in the study area. It ranged from ¢8000.00 to ¢20,000.00 with a mean cost of ¢ 12641.10. However, most of the farmers paid ¢15,000.000 for hired labour. The cost of labour was perceived as high by the respondents.

While 31.9% of the respondents said they always had farm inputs to buy, 47.0% of the respondents did not always get the inputs. Some (48.2%) travelled less than 8km to buy the farm inputs. The farthest point that a farmer had to travel to buy farm inputs was over 40km.

Financial assistance from financial institutions to farmers was limited. High interest rates, cumbersome procedure and lack of collateral security were the major constraints to farmers in securing loans from the financial institutions. Farmers who had the opportunity to access the bank facility were unable to always pay back for the credits because of high interest rates, vagaries of weather and poor yields of farms. Others attributed their inability to pay back the credits or loans to poor timing and release of the loans to them and short periods for which they were requested to pay back for the credit or loans.

Majority (84.9%) of the respondents had planted cocoa and 45.2% had oil palm farms. Others, 8.4%, 4.8% and 3.6%, owned citrus, coffee and coconut farms respectively. Cocoa had the largest mean size (5.8 ha) of farm. Rice and maize were the predominant cereal which had been planted at the time of the survey. Other predominant crops observed were cassava, yam, cocoyam, plantain, pineapple, okra, egg-plant, and tomato.

Livestock identified were cattle, sheep and goats and poultry. Few (4.3%) of the respondents had 10 to 40 cattle; 17.9% had one to 10 sheep and only 1.9% owned over 50 sheep on their farms. The results further showed that 2.5% of the respondents had over 30 goats and 4.9% owned a total of 232 pigs. With poultry

farming, each of the 18.5% respondents had less than 50 birds. Only four respondents (2.5%) had over 650 birds.

The results of Pearson product- moment correlation run for variables of the agro-enterprises of farmers showed that there were relationships between EOAED and availability of labour (r =.012), availability of farm inputs (r=109) and distances to sources of farm inputs (r=-.239) at 0.05 alpha level.

The study also assessed extension human resource management factors in respect of professional competence and motivation of agricultural extension agents (AEAs). The results showed that AEAs had opportunities to attend seminars and workshops to enhance their professional competence and motivation. Some of the respondents, 76.5%, 55.2% and 51.7%, attended seminars/workshops on HIV/AIDS retard agricultural development, monitoring and evaluation of RTIP and agronomy and pests control of cocoa respectively, among others.

The overall mean competence of the AEAs (as perceived by them) was moderate. Of the 90 respondents, 15.6% perceived their competence as high while 72.2% indicated that their competence was moderate. Only 12.2% responded that they had low competence. However, two DDAs and sixteen DDOs in the study area appraised the competence of AEAs as good.

The overall mean motivation of the AEAs (as perceived by them) was low. Of all the five motivational variables examined, 18.9% and 13.3% of the respondents stated that they were properly recognized and were satisfied with their jobs respectively. The results further showed that only 2.2% of the respondents said that they enjoyed good working conditions and were timely and regularly promoted.

Objective 3 of the study examined farmers' contact with AEAs, extension policy and funding of programmes, farmer participation in planning and implementation of extension programmes, logistical support for AEAs and extension education methods used by the AEAs. Other variables examined were average percentage of farmers who contributed during group discussions, reliability of AEAs, extent of farmers' satisfaction with the performance of AEAs and Research-Extension-Farmer linkages. Finally, relationships between EOAED and some variables of the extension information delivery and support factors were assessed.

The results showed that all the respondents had had contacts with extension except 9.2%. The results further showed that 16.6% of the respondents had less than three years working experience with AEAs; and 39.9% respondents had worked with the AEAs for more than 10 years. The mean working experience of the respondents with the AEAs was 3.5 years. Majority (75.0%) of the respondents received one and two visits in a month.

All the five DDAs and ten out of twenty DDOs surveyed, indicated that funds were fairly adequate for extension programmes but the funds were not always released on time for programmes.

The extent to which farmers participate in extension programme planning was also assessed in the study. The analysis of the results showed that majority (92.1%) of the respondents found it important that farmers should be involved in the planning of extension programmes. Only 3.6% respondents said it was not important to involve farmers in the planning of extension programmes. Generally, 64.9% and 16.4% of the respondents were highly and lowly involved in the

planning respectively. Occasionally, 18.7% of the respondents participated in the planning of extension programmes.

In the implementation of extension programmes, over 90.0% of the farmer respondents participated in weeding of farms, removal of mistletoes, harvesting of crops, drying of farm produce, and conduction of sales and over 75.0% of the farmers raised seedlings, applied fertilizers and sprayed insecticides to control pests. Other farming activities included fungicidal spraying and acquisition of farm inputs.

When asked to indicate their involvement in planning of extension programmes, one DDA and twelve DDOs responded that they were always involved in the planning. The overall participation of the DDOs was high in all the components of planning.

The study also examined logistical support for AEAs in the research area since the best personnel of extension can only perform when the necessary equipment is available and certain material conditions are fulfilled (Albrecht, 1989).When asked to indicate the percentage of AEAs provided with accommodation and motorbikes in the operational areas by MOFA, the DDAs responded that only 26.7% and 32.2% of the respondents had been provided with accommodation and motorbikes, respectively. Probed further, three of the five Districts paid travelling and transport claims monthly to AEAs. The other two districts paid quarterly.

The methods used by AEAs in extension education of farmers were also assessed. The results showed that over 85.0% of the respondents frequently used group discussions and farm visits. Other methods used were home visits, method and result demonstrations and field trip.

Contributions of farmers in discussions do help in extension duties and performance of an AEA. When asked to indicate the average number of farmers who normally contributed during group discussions (as perceived by them), 93.2% of the AEAs stated that between 20.0% and 80.0 % farmers contributed during group discussions.

Furthermore, when the farmers were asked to indicate their perceptions of extension education methods used by the AEAs in terms of effectiveness; most (84.0%) of the respondents rated farm visit as the most effective followed by group discussions, method and result demonstrations. The least effective method perceived by the respondents was radio.

Questions were also asked to determine whether there were formal linkages and close working relationships between the research -extension and farmers. The DDAs and the DDOs said that relationships existed through the work of the Research - Extension Liaison Committee (RELC) in the region. They further said that the districts had more close working relationships with the Crops Research Institute (CRI) and the Cocoa Research Institute of Ghana (CRIG) than any other research institute. In addition to farmer representatives on RELC, some farmers undertook field and farm visits to research stations. The farmers were also in constant touch with AEAs.

When asked about their perceptions of the reliability of the AEAs, majority (73.2%) of the respondents said that the AEAs were reliable and 14.7% stated that they were not reliable. In answer to another question, 74.4% respondents said they were satisfied with the overall performance of the AEAs. The reliability and the overall satisfaction with the AEAs' performance as perceived by the farmers were therefore high.

Marketing of farm produce was one of the major constraints encountered by farmers in the study area. When asked to indicate whether they had difficulties in selling their farm produce, 41.5% of the respondents indicated affirmatively. Responses to a further question as to the distances the farmers had to travel from their villages to the market centres revealed that most (72.0%) of the respondents travelled less than 16km while 25.6% travelled 16-64km to sell farm produce. Few (2.4%) respondents travelled over 64 km to market centres.

A correlational analysis was run to determine the EOAED and level of ompetence and motivational variables of AEAs and contributions of farmers during group discussions. The results showed positive and low correlations between EOAED and the level of competence, job satisfactions and recognition of AEAs at the 0.05 alpha level. Other variables which correlated positively but negligible with EOAED were working conditions, promotion and levels of salaries of AEAs. However, the relationship between EOAED and contributions of farmers during group discussions was moderate.

The relationships between EOAED and agricultural education methods (as perceived by farmers) were also investigated. The extension methods assessed were group discussion, method and result demonstrations, farm and home visits, field trip and radio. The EOAED correlated significantly with group discussions, method and result demonstrations, farm visit and field trip.

The results of a correlational analysis also run for some variables of the extension information delivery showed positive relationships between EOAED and farmer working experience with extension, number of monthly working visit to farmers by AEAs and the difficulties encountered by farmers in selling their farm

produce at the 0.05 alpha level. The correlations have revealed that efforts should be made by MOFA to motivate the AEAs to frequently visit the farmers.

Technological characteristics from the farmers' point of view were also examined in the study. The results showed that most (83.3%) of the respondents perceived the overall relative advantages of recommended practices as high; and 11.5% perceived the advantages as moderate. Only few (5.2%) of the respondents said that the recommended practices had no relative advantage. Furthermore, 69.8% and 60.8% of the respondents said that the recommended practices were highly compatible and easy to apply respectively.

The results also revealed that 66.3% of the respondents tried the recommended practices first on small scale before adopting them on a large scale. Most (82.1%) of the respondents indicated that the effects of the recommended practices were observable on their farms.

The results of Pearson product-moment correlation analysis showed substantial and moderate relationships between EOAED and compatibility and relative advantage of recommended practices respectively. The EOAED also correlated significantly with complexity, observability of recommended practices and farmers' satisfaction with the performance of AEAs. The relationship between EOAED and trialability of recommended practices was negligible.

From the responses of farmers, means, standard deviations and ANOVA were computed to show the overall EOAED and to compare the levels of effectiveness among the districts. The results showed that the overall mean effectiveness of agricultural extension delivery was generally low (x=2.1425, SD= 1.0503).. Each district also had a low mean level of EOAED. However Atwima District had the most effective extension delivery among the districts with a mean

of 2.6252 and Sekyere West, the least effective with a mean of 1.5313 (from a scale of 5 = very effective, 4 = effective, 3 = moderate/fair, 2 = ineffective, 1 = very ineffective). The result of ANOVA, showed significance at the 0.05 alpha level.

Comparisons made revealed significant mean differences among some districts for the EOAED in the study area. Between Atwima District and Sekyere West, Asante Akim North, or Ahafo-Ano district, the mean differences were significant. However, between Atwima and Adansi East District, the mean difference was not significant at the 0.05 alpha level. Statistically, the mean difference between Sekyere West and Ahafo- Ano North districts was also significant as well as the mean difference between Ashanti Akim North and Adansi East.

Furthermore, the levels of EOAED (as perceived by AEAs) were also determined during the study. Generally, the AEAs perceived the overall EOAED as moderate ($x = 3.5196$, $SD = 0.4991$). No significant differences were observed when the ANOVA was computed.

Farmers' perceived problems associated with agricultural extension delivery were identified. Majority (78.7%) of the respondents indicated that scarcity and high cost of farm inputs were the greatest constraints in their farming activities; followed by lack of credit facility and high interest rates charged on loans. Other constraints were supply and high cost of labour, marketing problems, vagary and poor weather conditions, pests and diseases, insufficient and irregular visits by AEAs.

Farmers made recommendations for improving the effectiveness of the agricultural extension delivery in the region. The first three of the

recommendations, in order of importance, were provision of credit facilities and soft loans to farmers, means of transport and regular visits by AEAs to farmers, supply of farm inputs and re-introduction of subsidy on the inputs. The three recommendations were made by between 64.6%, 63.9% and 62.7% of the respondents respectively.

The most important factors limiting the performance of AEAs were also identified in the study area. Of the 90 respondents, 61.1% indicated that insufficient means of transport was the most important. Other limiting factors were insufficient and irregular payments of travelling and transport claims, inadequate supply of logistics for AEAs, poor and low salary and delays in the promotion of AEAs.

Some important suggestions were made by the AEAs for improving their performance. Of the total 90 respondents, 61.1% and 60.0% of them suggested that they should be given adequate allowance with regular payments and sufficient means of transport respectively. Other suggestions made were improved and better salary and conditions of service, provision of AEAs with accommodation at the operational areas and regular organisation of seminars and workshops. Less that 10% of the respondents suggested that more AEAs should be recruited and more extension outlets opened.

To improve the effectiveness of agricultural extension delivery in the Ashanti Region, the AEAs made some recommendations. The first three recommendations, in order of importance were sufficient and timely supply of logistics to AEAs, frequent organizations of seminars and workshops for the AEAs and provision of sufficient and durable means of transport. These

recommendations were made by 38.8%, 25.9% and 24.7% of the 90 respondents respectively. The recommendations need to be seriously considered by MOFA.

A standard multiple regression analysis was run for the EOAED and independent variables of farmers. The results showed that the overall compatibility of recommended practices, the overall farmers' satisfaction with the performance of AEAs and result demonstrations were the best predictor variables of the EOAED. The R^2 and the adjusted R^2 were 0.721 (72.1%) and 0.521(52.1%) respectively. The three variables, total compatibility of the recommended practises, total farmers' satisfaction with the performance of AEAs and the total result demonstrations therefore explained 52.1% of the variance in the EOAED.

Furthermore, the results of the standard multiple regression analysis run for the independent variables scores of the AEAs showed that total job satisfaction of AEAs and total contributions of farmers during group discussions (as perceived by AEAs) were the best predictor variables of the EOAED. The R^2 and adjusted R^2 were 0.277 (27.7%) and 0.112 (11.2%) respectively. The two variables, the total job satisfaction of AEAs and the total contributions of farmers during group discussions explained 0.112 (11.2%) of the variance in the EOAED.

To conclude the summary, the results of the standard multiple regression analysis have shown that the compatibility of recommended practices to farmers, farmers' satisfaction with the performance of AEAs, result demonstrations, job satisfaction and contributions of farmers during group discussions were the best predictors of the EOAED in the study area. It is therefore important for researchers and the MOFA to always be guided by these best predictor variables to enhance effectiveness of agricultural extension delivery.

5.3 CONCLUSIONS

The following conclusions can be drawn from the study.

1. Most of the farmers in the study area were males and few were females at the time of the study. Physical and effectively, the male farmers would provide more effective labour than the females.

2. The ages of farmer- respondents ranged between 27 and 85 years with a mean age of 55.8 years. The farmers were aged and ageing. Physically, their age and declining health have a positive relationship with the work that the farmers can do; the older farmers would be less able to perform heavy tasks on their farms.

3. The study revealed 67.1% literate and 32.9% illiterate farmers. Majority of the literate farmers possessed the Middle School Leaving Certificate. Others had the Senior Secondary School Certificate, General Certificate of Education and Post Secondary Teachers' Certificate, Certificate in General Agriculture and a University Certificate. Handling these heterogeneous populations by the AEAs would pose a limitation. Many farmers would find it difficult to decode extension information and messages.

4. The farmers in the study area have rich working experience, averaging 26.3 years. They have long working experience and contact with AEAs. Some of the farmers sampled for the study had worked with the AEAs for more than 10 years and only few (9.2%) have no working experience with AEAs.

5. Family land, purchased land, share-cropping lands and leasehold were the major sources of land for farming in the study area. Family lands were the main source of farming.

6. Livestock production had not been given much attention in the study area. Few farmers had cattle, sheep and goats and pigs. There were also 26.5% poultry farmers.

7. There was a wide range of cost per manday of hired labour. The mean labour cost per manday was ¢12641.10. However, majority of the farmers perceived the cost of labour as high. Notwithstanding the high cost, 75.8% respondents did not always get hired labour for farm operations.

8. Farmers have difficulties in securing farm inputs in the study area. Majority of the respondents did not always get the inputs to buy. The shortest distance that some the farmers travelled to buy the inputs was up to 8km and the farthermost point for the farmers to purchase inputs was 40km.

9. Personal savings and assistance from money lenders formed the major sources of capital for establishing farms. Assistance from financial institutions was limited. Farmers' capacity to repay credit was low. High interest rates and collateral security thwarted the efforts of farmers from taking credits from the financial institutions.

10. The farmers in the study area have a high rate of contact with extension. Majority (75.0%) of the respondents received one or two visits in a month from the AEAs.

11. The results showed that 61.4% of respondents were involved in the identification of problems. Involvements of respondents in prioritisation of problems, setting up and review of objectives were low during planning by the MOFA.

12. Some (41.5%) of the respondents in the research area encountered difficulties in selling their farm produce. Few (2.4%) respondents travelled over 64km to sell their farm produce.

13. More than 83.0% and 69.0% of the respondents perceived the overall relative advantages and compatibility of the recommended practices as high. Majority of the respondents found the practices easy- to- apply and tried the practices on a small scale before adopting them in large scale. The effects of the recommended practices on their farms were easily noticed by the farmers.

14. The AEAs in the study area were perceived to be reliable and majority of the respondents (74.4%) were satisfied with their overall performance. Few farmers, however, were not at all satisfied with the performance of the AEAs.

15. The level of effectiveness of the agricultural extension delivery was low in the districts but there were significant differences among the districts. The extension delivery in the Atwima District was more effective than the extension delivery in Sekyere West, Asante Akim North or Ahafo-Ano North District. Similarly, the extension delivery was more effective in the Adansi East than in Asante Akim North District. Between Ahafo-Ano North and Sekyere West, the mean difference observed was also significant.

16. The level of education and working experience of the respondents positively correlated with the EOAED, indicating that the more educated and richly experienced the farmers were, the more effective would have been the extension delivery.

17. There were positive relationships between EOAED and farming experience of farmers with extension, number of monthly visits to farmers by AEAs, the overall relative advantage of recommended practices, difficulties encountered by farmers in selling farm produce and distances from the villages of farmers to market centres.

18. The EAOED also correlated with the compatibility and complexity of recommended practices and farmers' satisfaction with AEAs' performance.

19. There are more male agricultural extension agents (AEAs) in the research area than females. There would therefore be a good working relationship

between the AEAs and the farmers since 81.1% of the respondents were also males.

20. Most of the AEAs were between 30 and 50 years with a mean age of 38.9 years. Only 7.0% of them were over 50 years. Given the necessary logistics, the AEAs would perform creditably.

21. A high proportion (81.9%) of the AEAs possessed Certificate in General Agriculture and only few (6.8%) had Diploma in Agriculture and B.Sc. (Agriculture) certificates. The AEAs therefore possessed the basic qualification.

22. The bulk of the AEAs (67.9%) were appointed between 1985 and 1994. They therefore have rich working experience with an average experience of 12 years. Given the necessary logistics, incentives and motivation by the MOFA they would perform harder and creditably.

23. The overall motivation of AEAs was low. However, AEAs were moderately satisfied with their jobs as well as their recognition. The working conditions, the rate of promotion and the levels of the salary of the AEAs were low.

24. Funds usually released to districts for extension programmes were fairly adequate. They were, however, not always released on time.

25. Less than 33.0% of the AEAs in the study area had been provided with accommodation and means of transport (motorbikes) by the MOFA to perform their duties. Payments of their travelling and transport claims were done monthly and quarterly.

26. A high percentage of AEAs frequently used group discussions and farm visits methods to educate farmers. Other methods used frequently were the method and result demonstrations. In terms of effectiveness, most farmers rated farm visit as the most efficient, followed by the group discussions and result demonstrations.

27. The five districts in the study area have more closely working relationships with the Crops Research Institute (CRI) and the Cocoa Research Institute of Ghana (CRIG) than other research institutes.

28. With the exception of home visit and radio (as extension education methods), the EOAED correlated significantly with all the agricultural extension education methods studied (as perceived by the farmers and AEAs).

29. The rest of the variables which correlated significantly with the EOAED were job satisfaction and recognition of AEAS. Statistically, the working conditions, the rate of promotion and level of salaries of AEAs showed positive but not significant relationships with the EOAED at the 0.05 alpha level. There were also low negligible correlations between EOAED and the

working conditions, the rate of promotion and the level of salaries of AEAs. Therefore, job satisfaction and recognition of the AEAs were more important in terms of motivation of the AEAs than the working conditions, the rate of promotion and the level of salaries of the AEAs in the study area.

30. Compatibility of recommended practices to farmers, the satisfaction of farmers with the performance of the AEAs, the use of result demonstrations, job satisfaction of AEAs and contributions of farmers during group discussions were the best predictors of the EOAED in the study area.

5.4 RECOMMENDATIONS

Based on the findings of the study and discussion, the following recommendations are being made for consideration to improve the effectiveness of agricultural extension delivery (EOAED).

1. Women in Agricultural Development (WIAD) of MOFA should be assisted financially by the Government and MOFA to enable more females to take up agriculture, especially into processing of agricultural produce and marketing. All the District Assemblies should be provided with funds for on-lending to the women at low interest rates with a moratorium period of two years.

2. There is the need to lure more youth into agriculture. This can be done by improving the standard of living in the rural areas by providing water,

electricity and other amenities in the region. The District Assemblies in the region should also provide credits and loans to farmers.

3. To understand and adopt recommended practices, it is recommended that the AEAs would use group discussion extension education method and a lot of pictorials such as flips charts and life specimen in their education of farmers. The group discussions should also be complemented with more farm visits. Workshops, seminars and rallies should be organized by AEAs to further educate the farmers.

4. Most farmers farmed on family lands but litigations on such lands abound. To reduce the incidence of the litigations on family lands, it is recommended that the head of the family would always consult other members of the family before releasing lands to family members or selling any family land to would-be farmers. The head may form an oversight committee of family members to assist him.

5. The results of the study have shown that livestock production has not been given much attention in the study districts. There is therefore the need for the Regional Extension Directorate to intensify its farmer education and campaign on livestock production. This can be done through meetings, rallies, preparation and distribution of easy-to-read-and-understand folders, pamphlets and booklets on livestock production. The use of cinema vans with projectors to show films to educate farmers on livestock production is also recommended.

6. In this study, 81.8% respondents indicated that the mean cost of ¢12,641.10 (approximately ¢13,000.00) per manday of hired labour was high. Notwithstanding the high cost, 75.8% of the respondents did not always get labour to hire for farm operations. To assist the farmers in their farming activities, labour pools should be formed in the districts by the District Assemblies to enable farmers easily access hired labour.

7. The researcher recommends that the District Assemblies should set up farm input stores to assist farmers, and the government should provide seed money to the District Assemblies for on-lending to farmers to step up farm maintenance and yields.

8. To address the problem of insufficient AEAs at the operational areas, it is recommended that the MOFA Regional Extension Directorate in the Ashanti Region would recruit more AEAs and open more extension outlets.

9. To succeed in the implementation of extension programmes, it is recommended by the researcher that many farmers should always be involved in all aspects of planning. There should be intensive meetings, seminars, workshops and rallies before planning of programmes and projects to enable more farmers air their problems and views to assist the MOFA plan well. The farmer representation on the Regional Extension Linkage Committee (RELC) should also be increased to enable researchers and extension staff on the committee know more about farmers' problems.

This would assist researchers to make their researches more farmer-driven and adaptive.

10. Farmers sell their farm produce in the open market or through middlemen. Whenever there is a glut of farm produce on the markets, the farmers always received poor and low price for their produce. To sustain farmers' motivation to increase production of crops, the researcher recommends that the government, the MOFA and Districts Assemblies should buy at stable prices some quantities of farm produce (especially food crops and vegetables for storage) in the Ashanti Region.

11. The effects of extension work depend to a large extent on the professional competence of the AEAs. To improve the competence of the AEAs, more short courses, seminars and workshops should be organized by the MOFA for the AEAS. Sufficient logistical support should also be supplied to the AEAs.

12. To develop the maximum potential capacities of the AEAs and to improve their performance in the districts which scored very low effectiveness, the researcher recommends that the Regional Directorate of the MOFA should intensify its supervision of the districts to motivate and encourage the AEAs to perform better. The MOFA should also provide such districts with sufficient motorbikes and other logistics and pay AEAs allowances regularly.

13. The findings of the study have shown that EOAED correlated with characteristics of technologies. It is therefore recommended that researchers and the MOFA should be guided by this revelation and develop technologies which are relatively advantageous over the previous known ones. The technologies should be compatible to farmers, easily-to-apply, and their effects easily seen on farms by the farmers.

14. For sometime now, the MOFA always recruited and trained fewer females than the males in its agricultural colleges. Consequently, there have always been more male agricultural extension agents (AEAs) than females. This policy of the MOFA needs to be reviewed to increase the number of female- intake by the agricultural colleges for training as AEAs. It would go a long way to enhancing the EOAED since the females would be freer to work with the female farmers in the region.

15. The majority of the agricultural extension agents (AEAs) had the basic qualification before they were recruited and trained at the agricultural colleges of the MOFA. Some of them also had the opportunity to attend seminars and workshops to acquire more knowledge between 1994 and 2003. Given the necessary logistics and motivation, the AEAs would perform well. The MOFA should therefore organize more and frequent seminars, workshops, conferences and short courses to improve and sustain the competence of the AEAs.

16. The overall motivation of AEAs in the study area was low. The MOFA would need to review and improve the motivation and working conditions of the AEAs to enable them work harder and perform better. This can be done by providing accommodation and sufficient motorbikes for the AEAs and adequate maintenance allowances for the motorbikes. There should be an increase and regular payments of travelling and transport claims. There is also the need to improve the levels of salary and supply of sufficient logistics.

17. The best predictor variables of the EOAED were compatibility of recommended practices to farmers, satisfaction of farmers with the performance of AEAs, use of result demonstrations, job satisfaction of AEAs and contribution of farmers during group discussions. To improve the EOAED, it is very important that researchers and the MOFA should be guided by the best predictor variables when developing and recommending technologies to farmers. The MOFA should be guided by the predictor motivational variables to enhance EOAED in the region. There should also be a very close working collaboration between the research institutions and the MOFA to make research more farmer-driven and adaptive.

5.5 SUGGESTED AREAS FOR FURTHER STUDY

1. It is suggested that the study be extended to other districts in the region.
2. The study should be repeated with time to show the general trend of the effectiveness of the agricultural extension delivery (EOAED) in the Ashanti Region.
3. It is suggested that a study should be conducted on the re-introduction of subsidies on farm inputs to enable farmers have cheaper and stable prices of farm inputs for farming.
4. Finally, there should be a further study of the factors affecting farmers' constraints in securing credit facilities.

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APPENDICES

Appendix 1

Davis Convention for Description of Association

Coefficient (r)	Association
.70 or higher	Very strong
.50 - .69	Substantial
.30 - .49	Moderate
.10 - .29	Low
.01 - .09	Negligible

Source: Davis, 1971.

APPENDIX 2

QUESTIONNAIRE FOR FARMERS

FACTORS AFFECTING THE EFFECTIVENESS OF AGRICULTURAL EXTENSION DELIVERY

INTRODUCTION

Thank you for your willingness to share your precious time with us in an effort to improve the effectiveness of agricultural extension delivery.

Your ideas and experience in farming, comments and suggestions are very important to this study in the Region.

The results will be useful in assisting top management of the Ministry of Food and Agriculture (MOFA), the Council for Scientific and Industrial Research (CSIR), the Ghana Cocoa Board (COCOBOD) and other research institutions to make decisions for improvements in agricultural research and extension delivery.

General Guidelines

Please your response should be as sincere and objective as possible. There are no right or wrong answers. The information you provide will be handled confidentially.

Thank you.

PART ONE

- Please fill in the blank ..... or tick ( ) where applicable the answer of your choice.
- Where two or more possible answers are provided, choose the answers which apply to your situation.
- Write N/A where the question is not applicable. Kindly answer all questions

1. a) District .....

   b) Village Name .....

Characteristics of Farmer

2. Sex:

   a) Male ( )

   b) Female ( )

3. Please indicate your age at your last birthday in years

   .....

4. Kindly indicate your highest educational qualification. Please tick ( )

   a. No formal schooling/education ( )

   b. Middle School Leaving Certificate ( )

   c. Basic Education Certificate ( )

   d. Senior Secondary School Certificate ( )

   e. General Certificate of Education Certification ( )

   f. Other (state) .....

5. How long have you been working as a farmer? ..... years.

PART TWO

INFORMATION ON AGRO-ENTERPRISE

6. Please indicate your category of farming; tick ( )

   a. Full time ( )

   b. Part time ( )

   c. Absentee farmer ( )

7. Which of the following crops and approximate sizes of the farms do you have in the District? Please tick and indicate the acreage.

	Crop	Acreage of farm		Crop	Acreage of farm
a.	Cocoa ( )	.....	e.	Maize ( )	.....
b.	Coffee ( )	.....	f.	Cassava ( )	.....
c.	Oil palm ( )	.....	g.	Plantain ( )	.....
d.	Citrus ( )	.....	h.	Rice( )	.....
i.	Coconut ( )	.....	p.	Soybean ( )	.....
j.	Yam ( )	.....	q.	Carrot ( )	.....
k.	Cocoyam ( )	.....	r.	Lettuce ( )	.....
l.	Pineapple ( )	.....	s.	Tomato ( )	.....
m.	Garden eggs ( )	.....	t.	Pepper ( )	.....
n.	Cabbage ( )	.....	u.	Okra ( )	.....
o.	Onion ( )	.....	v.	Cowpea ( )	.....

8. Do you also have mixed cropped farms in the District? Yes ( ) No ( )

9. If 'yes' to Question 8, kindly indicate the mixed crops and acreage of the farm(s):

Names of mixed crop	Approximate acreage
.....	.....
.....	.....
.....	.....
.....	.....

10. Do you also have livestock farms in the District? Yes ( ) No ( )

11. Please indicate the type of livestock and quantity (total number) of the livestock. Use the table below:

Type of livestock	Tick ( )	Total number
Cattle		
Sheep		
Goats		
Pigs		
Poultry		
Other (specify)		

12. Availability of labour. Please tick ( )

a. Always ( ) b. Sometimes ( ) c. Not available ( )

13. Kindly indicate your source(s) of labour for farm maintenance.

Please tick ( )

a. Family ( ) b. Caretaker ( ) c. Hired ( )

d. Communal (Nnoboa) ( ) e. Other (specify) .....

14. What proportion/percentage of labour is provided by your family (yourself, wife and children combined) on the farm? Please tick ( )

a. Less than 10% b. 10 – 20% c. 21 – 30%

d. 31 – 40% e. Over 40%

15. What is the labour cost/fee per day in your area? Indicate the cost in cedis

.....

16. What is your perception of the cost/fee per day in your area?

a. Very high ( ) b. High ( ) c. Moderate ( )

d. Low ( ) e. Very low ( )

17. Availability of farm inputs. Please tick ( )

a. Always ( ) b. Not always ( ) c. Not available ( )

18. Distance to source(s) of your farm inputs;

a. Less than 5 miles ( ) b. 5 – 10 ( ) c. 11 – 15 ( )

d. 16 – 20 ( ) e. 21 – 25 ( )

f. More than 25 miles ( )

19. From what source(s) of finance did you obtain capital to establish your farm? Tick ( )

a. Own savings ( ) b. Family ( ) c. Friend(s) ( )

d. Bank loan ( ) e. Money lender ( )

f. Other (specify) .....

20. Have you ever received any financial assistance from any financial institution?

Yes ( ) No ( )

21. How do you describe your access to financial assistance from the financial institution? Tick ( )

a. Very easy b. Easy c. Difficult

d. Very difficult e. Cannot say/tell

22. What has been the major problem in credit acquisition? Please tick ( )

a. High interest rate ( ) b. cumbersome processing procedure( )

c. No collateral security ( ) d. Does not apply to me (N/A) (

e. State any other .....

23. Do you normally pay back the credit/loan on schedule?

a) Yes ( ) b) No ( ) c) Does not apply to me ( )

24. Give reasons for your inability to pay back the credit/loan as scheduled?

a. .....

b. .....

c. .....

d. .....

e. .....

25. How long have you been working with agricultural extension agents (AEAs) in your locality? Please tick ( )

a. Not yet ( ) b. Less than 3 years ( ) c. 3 – 6 years ( )

d. 7 – 10 years e. Over 10 years

26. How many times in a month does the AEA visit you?

a. No visit ( ) b. Once ( ) c. Twice ( )

c. Thrice ( ) d. Four or more times ( )

27. How do you consider the involvement of farmers in the planning of extension programmes? Tick ( )

a. Very important ( ) b. Important ( )

c. Somewhat important ( ) d. Not important ( ) e. Not very important ( )

28. To what extent do you participate in the following planning activities of extension programme? Please tick.

Aspect of Planning	Very High	High	Occasional	Low	Very Low
Identification of problems	5	4	3	2	1
Prioritisation of problems	5	4	3	2	1
Setting up of objectives	5	4	3	2	1
Review of objectives	5	4	3	2	1

29. With your working experience and contact with Extension (MOFA), will you say that the practices recommended to you by the AEA(s) have any relative advantage over your previous known practices?

Yes ( ) No ( )

30. Kindly indicate your perception of the overall relative advantage of the recommended practices to you. Please tick ( )

a. Very high ( ) b. High ( ) c. Moderate ( )

d. No relative advantage ( )

31. Are you recommended practices by the AEA compatible (suitable) with your previous known practices? a) Yes ( ) b) No ( )

c) Cannot say/tell ( )

32. How compatible (suitable) are the recommended practices to you?

a. Very highly compatible ( ) b. Highly compatible ( )

c. Quite compatible ( ) d. Not compatible ( )

e. Not at all compatible ( ) f. Cannot say/tell ( )

33. Are the recommended practices complex and difficult to apply?

a) Yes ( ) b) No ( ) c) Cannot say/tell ( )

34. How will you rate the use of the overall recommended practices? Please tick ( )

a. Very easy to use b. Easy c. Quite easy d. Difficult

e. Very difficult f) Cannot say/tell

35. Do you normally first try any recommended technology/practice on a small scale on your farm before adopting the technology fully on a large scale?

Yes ( ) No ( )

36. How observable (noticeable) are the effects of the overall recommended technologies/practices on your farm(s)?

.....

.....

.....

37. The following are the methods or means by which extension agents (AEAs) transfer information about practices to farmers to help improve their farming. Kindly indicate your perceptions of the effectiveness of the methods used in the dissemination of the information/ideas.

Please tick ( )

METHOD	Perception of effectiveness				
	Very Effective	Effective	Somewhat Effective	Ineffective	Very Ineffective
Group discussion	5	4	3	2	1
Method demonstration	5	4	3	2	1
Result demonstration	5	4	3	2	1
Farm visits	5	4	3	2	1
Home visits	5	4	3	2	1
Field trips (to other farmers' farm)	5	4	3	2	1
Radio	5	4	3	2	1

38. Does the extension agent (AEA) in your area organize field trips (ie take you to other farms) to show you improved techniques/practices which have been practised by other farmers or on research stations? Tick ( )

Yes ( ) Not Always ( ) No ( )

39. Kindly indicate other source(s) of information you receive for farming.

Please tick ( )

a. From contact ( ) b. From non-contact farmers ( )

c. Bulletins, periodicals, magazines, journals ( )

Other (specify) .....

40. Is the AEA reliable (dependable) in the performance of his/her duties?

Tick ( )

a. Very reliable ( ) b. Reliable ( ) c. Quite reliable ( )

d. Not reliable ( ) e. Not at all reliable ( )

41. To what extent are you satisfied with the overall performance of the extension agent (AEA)?

a. Very much satisfied ( )

b. Satisfied ( )

c. Quite satisfied ( )

d. Not satisfied ( )

42. By what means of communication channels do you pass on your farming problems to research scientists? Kindly tick ( ) all that apply.

a. Through AEA's farm visits ( ) b. Through contact farmers ( )

c. Through farmers' meetings ( ) d. Through AEA's home visits

e. Through visits to extension office ( ) f. Other (specify) .....

43. Do you have difficulty in selling your farm produce? Yes ( ) No ( )

44. How far is the market(s) for the sale of your farm produce from your village? Kindly tick ( )

a. Less than 10 miles b. 10 – 20 miles c. 21 – 30 miles

d. 31 – 40 miles e. Over 40 miles

45. How effective is the overall agricultural extension delivery in your area?

Kindly tick ( )

a. Very effective b. Effective c. Moderately effective

d. Not effective e. Not at all effective

46. List major problems which adversely affect your farming activities.

a.....

b.....

c.....

d.....

e.....

47. Finally, what recommendations would you like to make for improving the effectiveness of agric. extension delivery?

a.....

b.....

c.....

d.....

e.....

APPENDIX 3

QUESTIONNAIRE FOR AGRICULTURAL EXTENSION AGENTS (AEAs)

FACTORS AFFECTING THE EFFECTIVENESS OF AGRICULTURAL EXTENSION DELIVERY

The Aim of this study:

I am happy to inform you that you have been chosen to participate in this study in the Region

The study is aimed at finding out the factors that affect the effectiveness of agricultural extension delivery in the Region.

The results of the study will provide valuable information which will help the management of the Ministry of Food and Agriculture (MOFA), the Council for Scientific and Industrial Research of Ghana (CSIR), the Ghana Cocoa Board (COCOBOD), the Cocoa Research Institute of Ghana (CRIG) and other research institutions to make decisions for improvements in agricultural research and extension delivery.

General Guidelines

Please respond to this questionnaire in terms of your beliefs and feelings. There are no right or wrong answers. The information you provide will be handled confidentially.

Thank you.

PART ONE

Please fill in the blank ..... or tick ( ) where applicable the answer of your choice.

Where two or more possible answers are provided, choose the answers which apply to your situation.

Write N/A where the question is not applicable. Kindly answer all questions

1. a) District .....

   b) Zone .....

2. Sex:

   a) Male ( )

   b) Female ( )

3. Please indicate your age at your last birthday in years

   .....

PART TWO

PERSONAL COMPETENCE AND MOTIVATION OF AGRICULTURAL EXTENSION AGENT (AEA)

4. Kindly indicate your highest educational qualification. Please tick ( )

   a. Middle School Leaving Certificate ( )

   b. Basic Education Certificate ( )

   c. Senior Secondary School Certificate ( ).

   d. General Certificate of Education ( )

   e. General Certificate of Agriculture ( )

   f. Diploma in Agriculture ( )

   g. B.Sc (Agric) Certificate ( )

h. M.Sc (Agric) Certificate ( )

i. M.Phil Degree Certificate ( )

j. Other (state) .....

5. Where did you receive initial training to become an agricultural extension agent (AEA)? Kindly tick ( )

a. Kwadaso Agric College( ) b. Ejura Farm Institute ( )

c. Ohawa Farm Institute ( ) d. Nyankpala Farm Institute( )

e. Asuansi Farm Institute( ) f. Bunso Cocoa College ( )

g. University (KNUST) Kumasi ( ) iUniversity of Cape Coast ( )

j Damongo Agric. College ( ) Others (indicate) .....

6. Kindly indicate the number of years you have worked as an AEA?

Number of years worked .....

7. In which year were you appointed as an AEA? .....

8. Have you had any further in-service training after your initial training?

Yes ( ) No ( )

9. If yes to Question 8, kindly state the type(s) of in-service training.

i.

ii.

iii.

iv.

10. Are you given the opportunity to attend seminars or workshops?

Yes ( ) No ( )

11. Kindly indicate the year in which you attended the last seminar(s) or workshop(s) .....

12. Kindly list the any seminar(s) or workshop(s) that you attended.

a).....

b).....

c).....

d).....

e).....

f).....

13. Approximately, how many farmers are in your operational area?

Give the number ...

.....

14. Which is your major language(s) of communication with farmers?

Tick ( ) all that apply

a.	English	( )	b.	Twi	( )
b.	Fanti	( )	d.	Ewe	( )
e.	Ga	( )	f.	Hausa	( )
g.	Sissala	( )	h.	Dagbane	( )
i.	Other (state)				

.....

15. Which extension teaching methods do you use frequently to educate your farmers? Please tick ( ) all that apply.

a.	Group discussions	( )	b.	Method demonstration	( )
c.	Result demonstration	( )	d.	Farm visits	( )
e.	Home visits	( )	f.	Field trips	( )

16. On the average, what percentage of farmers usually contribute during group discussions? Tick ( )

a. Less than 20% b. 20 – 40%

c. 41 – 60% d. 61 – 80% e. Over 80%

COMPETENCE

17. Please indicate your level of agreement with each statement below by circling the number that best corresponds to your agreement. Use the following rating scale: 5 = Strongly Agree 4 = Agree 3 = Somewhat Agree= 2 Disagree 1 = Strongly Disagree

I am competent at my job 5 4 3 2 1

I am provided with the right logistics for my job 5 4 3 2 1

The logistics provided for my job are enough 5 4 3 2 1

I receive scheduled supervisory visits from my supervisors ... 5 4 3 2 1

My performance is evaluated on schedule by supervisors 5 4 3 2 1

I receive scheduled feedback for the evaluation from my supervisors 5 4 3 2 1

I have good relations with my supervisors 5 4 3 2 1

I receive constructive criticism from my supervisors when necessary 5 4 3 2 1

I receive appropriate punishment from my supervisors when deserved 5 4 3 2 1

18. Further, use the same rating scale (5 = Strongly agree, 4 = Agree, 3 = Somewhat agree, 2 = Disagree, 1 = Strongly disagree) to indicate your feelings about your motivation

JOB SATISFACTION

I have the opportunity to take part in important decision-making 5 4 3 2 1

I receive some monetary reward, other than my salary, from time to time 5 4 3 2 1

I receive non-monetary gifts from time to time 5 4 3 2 1

I am placed in an area of my work where I have great interest ... 5 4 3 2 1

My job is interesting 5 4 3 2 1

I like my job better than most AEAS 5 4 3 2 1

I will not like to give up this job for another with equal conditions of service 5 4 3 2 1

I have the opportunity to use my skills and abilities in my job ... 5 4 3 2 1

19. WORKING CONDITIONS

Working conditions in the Agricultural Extension Services are generally conducive to me 5 4 3 2 1

Working conditions have improved since I joined Agric Extension Services 5 4 3 2 1

Promises made to me as an AEA are mostly kept by Management 5. 4 3 2 1

Working conditions are managed in a way that is comfortable to me 5 4 3 2 1

Management is always prepared and willing to deal with my personal problems 5 4 3 2 1

I am provided with accommodation in my job area or given support to secure accommodation 5 4 3 2 1

I am paid T & T and other allowances regularly 5 4 3 2 1

I am promoted on time 5 4 3 2 1

20. RECOGNITION

I receive praise verbally for good performance 5 4 3 2 1

I receive tangible recognition (eg. certificate of merit) from my supervisors when necessary.....5 4 3 2 1

I am given a fair chance of winning a best AEA award 5 4 3 2 1

My achievements are acknowledged by my supervisors 5 4 3 2 1

I am given material awards as a show of appreciation for good performance at functions 5 4 3 2 1

21. SALARIES

I receive adequate salary for my work 5 4 3 2 1

Salary issues in Agric Extension Services are managed promptly 5 4 3 2 1

My salary level enhances my ability to meet personal needs 5 4 3 2 1

Friends with the same qualification in other Government establishment receive the same salaries as I do 5 4 3 2 1

22. PROMOTION

Promotion prospects are timely in agricultural extension services 5 4 3 2 1

My promotion is more related to my years of service 5 4 3 2 1

My promotion follows prescribed routine spelt out in the conditions and scheme of services of an AEA 5 4 3 2 1

I am not discriminated against in terms of promotion by my supervisors 5 4 3 2 1

I am promoted on time based on my performance 5 4 3 2 1

Promotion in Agric extension service is based on the principle of fairness and equity 5 4 3 2 1

INFORMATION DELIVERY

23. How many group meetings are you expected to hold in a month? ...

24. Are you able to hold the total number of the expected number of group meetings in a month? Yes ( ) No ( )

25. If your answer to Question 24 is No; what prevents you from holding the expected number of the group meetings? Please give reasons.

a. .....

b. .....

c.....

26. Do you use farmers' farms/fields for on-farm demonstrations of improved practices? Yes ( ) No ( )

27. Indicate percentage of your demonstrations done on farmers farms/fields?

a.Less than 20% b. 21 – 40% c. 41 – 60% d. 61 – 80%

e. More than 80%

28. With your working experience as an AEA, is there any formal working linkage between extension work and researchers at any of the research institutions listed below? Please tick ( )

a. Research Stations of Universities ( )

b. Crop Research Institute (CRI) ( )

c. Cocoa Research Institute of Ghana (CRIG) ( )

d. Soil Research Institute (SRI) ( )

e. Food Research Institute ( )

29. What percentage of farmers do you think are using the recommended practices in your area? Please tick ( )

a. Less than 20% b. 20 – 40% c. 41 – 60%

d. 61 – 80% e. Over 80%

30. Kindly give reasons why the remaining farmers are not using the recommended practices in your area.

a.....

b.....

c.....

d.....

e.....

31. By the activities listed below closer to researchers and farmers. Kindly indicate your perceptions of the degree of effectiveness in your area, using the following rating scale: 5=Very effective 4=Effective 3=Somewhat effective 2=Ineffective 1= Effective

Joint priority setting in planning 5 4 3 2 1

Problem diagnosis of farmers 5 4 3 2 1

Participation in on-farm trials 5 4 3 2 1

Participation in farmers' day celebrations.....5 4 3 2 1

Joint field visits 5 4 3 2 1

Attendance at method demonstrations 5 4 3 2 1

Workshops, seminars and conferences 5 4 3 2 1

32. Based on your working experience, what do you think are the most important factors limiting AEAs in the performance of their duties?

a.....

b.....

c.....

d.....

e.....

33. What suggestions would you like to make for improving the performance of AEAs?

a. .....

b. .....

c. .....

d. .....

e. .....

34. What recommendations would you like to make for improving the effectiveness of agricultural extension delivery?

a.....

b.....

c.....

d.....

e.....

APPENDIX 4

PERFORMANCE APPRAISAL OF AEAS AND PERCEIVED BY DISTRICT DEVELOPMENT OFFICERS (IMMEDIATE SUPERVISORS)

Please fill in the blank ..... or tick ( ) where applicable the answer of your choice.

Where two or more possible answers are provided, choose the answers which apply to your situation.

Write N/A where the question is not applicable. Kindly answer all questions

1. Region .....
2. District .....
3. Zone .....
4. What percentage of your AEAs clearly know and understand the aims and objectives of MOFA? Please tick ( )

   a. Less than 20% ( ) b. 20 – 40% c. 41 – 60%

   d. 61 – 80% e. Over 80%

5. How adequate are the funds released for extension programmes in your area?

   a. Adequate b. Fairly adequate c. Inadequate

6. Are the funds for the programmes released timely as scheduled?

   Yes ( ) Not Always ( ) No ( )

7. How regular are the travelling and transport (T & T) claims paid to the AEAs under you? Please tick ( )

   a. Weekly ( ) b. Fortnightly ( ) c. Monthly ( )

   d. Bi-monthly ( ) e. Quarterly ( ) f. Other (state) .....

8. How many AEAs do you supervise in your area? ..... (number).

9. Are targets set for your AEAS? Yes ( ) No ( )

10. Indicate the percentage achievements of targets set for your District for 2000 and 2001 years

		2000	2001
a.	Crop production	.....%	.....%
b.	Livestock	... .%	.....%
c.	Farm visits	.....%	.....%
d.	Demonstrations	.....%	.....%
e.	Adopters of technologies	.....%	.....%

11. Indicate percentage of your AEAs provided with,

a. Accommodation .....% b. Motor bikes .....%

12. Do you conduct monthly training for the AEAs? Yes ( ) No ( )

13. Who are the resource personnel (rank) for the monthly training sessions?

a. .....

b. .....

c. .....

d. .....

14. Which teaching aids do the trainers use? Kindly state.

a. .....

b. .....

c. .....

d. .....

e. .....

15. Are you involved in the planning of extension programmes for your District/Area? Yes ( ) Not Always ( ) No ( )

16. To what extent are you involved in the planning of extension programmes? Please tick ( )

Aspect of Planning	Very High	High	Occasional	Low	Very Low
Identification of problems	5	4	3	2	1
Prioritisation of problems	5	4	3	2	1
Setting up of objectives	5	4	3	2	1
Review of objectives	5	4	3	2	1

17. Does your District organize seminars, workshops or conferences for the AEAs. Yes ( ) No ( )

18. On the average, how many seminars, workshops and conferences are organized in a year? Please state the total number

a. Seminars .....

b. Workshops .....

c. Conferences .....

19. Do the seminars, workshops and the conferences add any knowledge to the AEAs? Yes ( ) No ( )

20. Kindly state only three benefits which were derived by the AEAs from the previous seminars, workshops and the conferences.

a. .....

b. .....

c. .....

21. Indicate five motivational facilities that are enjoyed by the AEAs in your District/Area.

a. .....

b. .....

c. .....

d. .....

e. .....

22. Please assess the strengths and weaknesses of your AEAs in terms of their responsibilities. The overall performance of your AEAS are:

a. Excellent ( ) b. Good ( ) c. Average ( )

d. Below average ( ) e. Poor ( )

23. Is there any formal linkage between extension work in your District and research institutes listed below: Kindly tick ( )

a. Crop Research Institute (CRI) ( )

b. Soil Research Institute (SRI) ( )

c. Cocoa Research Institute of Ghana (CRIG) ( )

d. Research Departments of University, Legon ( )

e. Research Departments of University KNUST, Kumasi ( )

f. Research Departments of University Cape Coast ( )

25. Kindly make <u>five</u> suggestions for improving the effectiveness of the agricultural extension delivery in your District.

a. .....

b. .....

c. .....

d. .....

APPENDIX 5

PERFORMANCE APPRAISAL OF THE DISTRICT BY THE DISTRICT DIRECTOR OF AGRICULTURE (DDA).

Please fill in the blank ..... or tick ( ) where applicable the answer of your choice.

Where two or more possible answers are provided, choose the answers which apply to your situation.

Write N/A where the question is not applicable. Kindly answer all questions

1. Region .....
2. District .....
3. Do your AEAs know and understand the aims and objectives of MOFA?

   Yes ( ) No ( )
4. To what extent do they know and understand the aims and objectives of MOFA?

   a. Very well b. well c. Fairly well d. Not very well

   d. Not well
5. How adequate are funds released for extension programmes in your District?

   a. Adequate b. Fairly adequate c. Inadequate
6. Are the funds for the extension programmes release timely as schedule?

   Yes ( ) Not always ( ) No ( )
7. How regular are the travelling and transport (T & T) claims paid to the AEAs in your District?

   a. Monthly ( ) b. Bi-monthly ( ) c. Quarterly ( )

8. How many AEAs are in your District? .....

9. Are annual targets set for your District? Yes ( ) No ( )

10. Kindly indicate the percentage achievements of targets for the year 2000 .....% and 2001 .....%

11. Indicate the percentage of the total AEAs in your District who are provided with the following:

    a. Accommodation .....%

    b. Motor bikes .....%

12. Are monthly trainings conducted for the AEAs in the District?

    Yes ( ) No ( )

13. Who are the resource personnel (rank) for the monthly training sessions?

    a. .....

    b. .....

    c. .....

14. Which teaching aids are used by the resource personnel? Kindly state them.

    a. .....

    b. .....

    c. .....

    d. .....

15. Are you involved in the planning of extension programmes for the whole Region?

    Yes ( ) At Always ( ) No ( )

16. To what extent are you involved in the planning of the extension programmes for the Region? Please tick ( )

Aspect of Planning	Very High	High	Occasional	Low	Very Low
Identification of problems	5	4	3	2	1
Prioritisation of problems	5	4	3	2	1
Setting up of objectives	5	4	3	2	1
Review of objectives	5	4	3	2	1

17. Are you involved in the planning, implementation and evaluation of extension programmes for your District? Please tick ( )

a. Planning: Yes ( ) No ( )

b. Implementation: Yes ( ) No ( )

c. Evaluation: Yes ( ) No ( )

18. Kindly indicate how you are involved in the planning, implementation and evaluation of the programmes

a. Planning

.....

b. Implementation

.....

c. Evaluation

.....

19. Does your District organize seminars, workshops or conferences for the AEAs?

20. On the average, how many seminars, workshops or conferences are organised in a year? (Nos)

a. Seminars .....

b. Workshops.....

c. Conferences .....

21. What is your perception of motivation of AEAS in your District? Kindly tick ( )

a. AEAs are very highly motivated

b. AEAS are highly motivate

c. AEAs are fairly motivate

d. AEAs are lowly motivated

e. AEAs are very lowly motivated

22. Kindly indicate five factors that you think have been motivating the AEAs in the District

a. .....

b. .....

c. .....

d. .....

e. .....

23. Rate the overall performance of the AEAs in your District.

Please tick ( )

a. Outstanding performance b. Good c. Average

d. Below average e. Poor

24. Is there any formal linkage between the extension work in your District and research institutes listed below? Tick ( ) please.

a. Crop Research Institute (CRI) ( )

b. Soil Research Institute (SRI) ( )

c. Cocoa Research Institute of Ghana (CRIG) ( )

d. Research Departments of University, Legon ( )

e. Research Departments of University KNUST, Kumasi ( )

f. Research Departments of University Cape Coast ( )

25. Kindly make suggestions for improving the effectiveness of the agricultural extension delivery in your District.

a. .....

b. .....

c. .....

d. .....

e. .....

APPENDIX 6

QUESTIONNAIRE TO THE REGIONAL DIRECTOR

Please fill the bank spaces ..... or tick ( ) where applicable the answer of your choice.

Where two or more possible answers are provided, choose the answers which apply to your situation.

Write N/A where the question is not applicable. Kindly answer all questions.

1. Region .....

2. How. adequately are funds released for extension programmes in your Region?

   a. Adequate b. Fairly adequate c. Inadequate

3. Are the funds released for the extension programmes in the Region?

   Yes ( ) Not Always ( ) No ( )

4. What are the source(s) of funding extension programmes in the Region?

   a. .....

   b. .....

   c. .....

   d. .....

5. How regular are funds released to the Districts for the payments of travelling and transport (T & T) claims?

   a. Monthly ( ) b. Bi-monthly ( )

   c. Quarterly ( ) d. Other (specify) .....

6. Are annual targets set for the Districts in the Region?

   Yes ( ) No ( )

7. Kindly indicate the percentage achievements of targets set for your Region for the years, 2000 and 2001 in terms of crops production and livestock. Please complete the table below.

Crop	Year, 2000		Year, 2001	
	Target	% Achievement	Target	% Achievement
Cocoa				
Coffee				
Oil palm				
Citrus				
Maize				
Cassava				
Plantain				
Rice				
Yam				
Pineapple				
Egg plant				
Tomato				
Pepper				
Okra				
Onion				
Cowpea				
Soybean				

8. Further, kindly indicate the percentage achievements of targets for livestock production for 2000 and 2001 years.

Livestock	Year, 2000		Year, 2001	
	Target	% Achievement	Target	% Achievement
Cattle				
Sheep				
Goats				
Poultry				

9. Approximately, how many AEAs are provided with accommodation and motorbikes in the Region by MOFA?

a. AEAs provided with accommodation .....%

b. AEAs provided with motorbikes .....%

10. Are the District Directors (DDA) and the Regional Development Officers (RDOs) involved in the planning of extension programmes in the Region?

Yes ( ) No ( )

11. To what extent do you involve the DDAs and RDOs in the planning of extension programmes?

Aspect of Planning	Very High	High	Occasionally	Low	Very High
Identification of problems	5	4	3	2	1
	5	4	3	2	1
Prioritisation of problems	5	4	3	2	1
	5	4	3	2	1

	5	4	3	2	1
Setting targets					
Setting up of objectives					
Review of objectives					

12. Do you organize seminars, workshops or conferences for the DDAs and DDOs? Yes ( ) No ( )

13. On the average, how many seminars, workshops and conferences are organized for the DDAs and DDOs in a year?

    a. Seminars .....

    b. Workshops .....

    c. Conferences .....

14. What is your perception of motivation provided to AEAs in the Region? The AEAs in the Region are;

    a. Very highly motivated b. Highly motivated

    c. Fairly motivated d. Lowly motivated

    e. Very lowly motivated

15. Kindly indicate the factors that you think have been motivating the AEAs in the Region

    a. .....

    b. .....

    c. .....

    d. .....

16. Finally, kindly make suggestions for improving the effectiveness of the agricultural extension delivery in the Region.

    a. .....

b. .....

c. .....

d. .....

e. .....

f. .....

g. .....

h. .....

i. .....

j. .....