

**THE EFFECT OF TRAINING ON EXTENSION WORKERS' PERFORMANCE:
A CASE STUDY OF FRONT LINE STAFF IN THE SUHUM KRABOA-
COALTAR AND WEST AKIM DISTRICTS IN THE EASTERN REGION OF
GHANA**

BY



JOHN NKETIA GYENFIE

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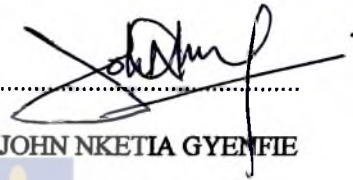
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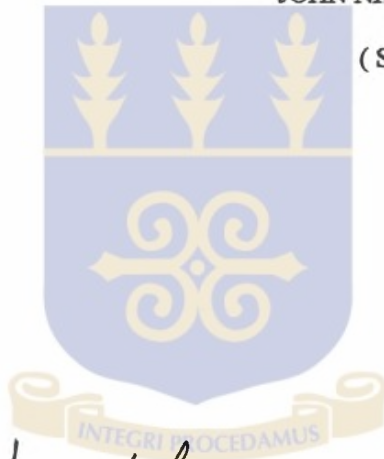
DECLARATION

I hereby declare that the work presented in this thesis was carried out by myself and has never in any part or whole been presented to any other university for the award of a degree.



JOHN NKETIA GYEMFIE

(STUDENT)



DR. OWURAKU SAKYI-DAWSON

(SUPERVISOR)

DEDICATION

Dedicated to Felicia, Enoch and Andrew.



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ABSTRACT

Despite concerted effort at improving the extension delivery in Ghana, the performance of the Front Line Staff of the Ministry of Food and Agriculture's Extension Services has been lower than expected. It is expected that among others, appropriate training will enhance their performance. However it is not clear what the nature and content of such training should be. The study therefore was to find out whether the content of training provided to the extension workers affected their performance and if so which content is likely to enhance performance. The study was guided by the assumption that farmers have needs, some of which are their training needs. That for the extension workers to be able to provide appropriate training to farmers, they should be trained in those needs. This is likely to enhance extension worker performance.

A survey was conducted in the Suhum Kraboa-Coaltar and West Akim districts of the Eastern Region of Ghana using a checklist and survey questionnaire to collect information from the FLS and their farmers. Data collected included the content of training FLS have received, needs of farmers and the nature and content of messages farmers have received from their FLS, and their adoption behaviour.

It was found that there was no difference between the farmers of FLS who have received wide and those with narrow knowledge with regard to adoption. However, farmers tended to adopt technologies in which the Front Line Staff received adequate training. Personal characteristics such as educational background, total farmland available, and purpose of farming are important factors affecting adoption patterns. The findings

indicate that the span of knowledge received by the FLS during training is not an important determinant of adoption behaviour of farmers, rather it is important that Front Line Staff are provided with in-depth training in activities that farmers are engaged in.

It is concluded that training in a wide range of subjects without going into details would not enhance adoption. This is critical, especially in the Training and Visit (T&V) management system where there is regular training. Such training should aim not only to increase span but in addition the content should be detailed. Personal characteristics such as educational background, access to land and purpose of farming are likely to be important basis of demarcating recommendation domains for extension messages.



Table of Contents

	Page
Declaration	II
Dedication	III
Acknowledgment	IV
Abstract	VI
Table of Contents	VIII
List of Tables	XVII
List of Figures	XXIV
List of Appendices	XXV
List of Acronyms	XXVI
Chapter One	
Background	1
1.0 Introduction	1
1.1 Role of agriculture in Ghana	1
1.2 Role of agricultural extension in Ghana	4
1.3 Experiences from the various extension approaches	6
1.4 Research Problem	8
1.5 Main Research Question	9
1.5.1 Specific Research Question	9
1.6 General Objective	9

1.6.1	Specific Objectives	9
1.7	Theoretical framework	10
1.8	Research hypothesis	10
1.9	Significance of the research	12
1.10	Definition of concepts	12
Chapter Two		
Literature review: Training and performance of agricultural workers		
2.0	Introduction	15
2.1	Importance of training	15
2.2	Different perspectives on worker job performance	16
2.3	Factors which affect workers' job performance	17
2.4	Justification for training as an important area likely to highly affect job performance	19
2.5	Evidence on training content and worker job performance	20
2.6	Role of the Front Line Staff as change agent	22
2.7	Competencies required for extension workers to perform task	24
2.8	Types of training.	29
2.9	Types of In-service training	31
2.10	Training of Agricultural workers in Ghana	33
2.11	Needs of farmers	37
2.12	Problems associated with providing training	40
2.13	Adoption of innovation	42

2.14	Summary	43
Chapter Three		
	Methodology	46
3.0	Introduction.	46
3.1	Population for the study	46
3.2	Sample selection and sample size	46
3.3	Data collection	47
3.4	Data collection process	50
3.5	Problems encountered on the field	51
3.6	Data Analysis	51
Chapter Four		
	The Study Area	53
4.0	Introduction	53
4.1	Demography and Agro-climatology	53
4.2	Calendar of farming activities	56
4.2.1	Types of crops grown and animals reared	56
4.3	Farming enterprises farmers indicated they needed technical messages on	60
4.4	Extension methods and channels of communication preferred by farmers	61
4.5	Forum to discuss farmers' needs	62
4.6	Summary	62

Chapter Five

Nature and content of training and span of knowledge of Front Line Staff	64
5.0 Introduction	64
5.1 Personal characteristics of Front Line Staff	64
5.1.1 Age	65
5.1.2 Gender	65
5.1.3 Marital status	66
5.1.4 Agricultural college attended	66
5.1.5 Year of completion of agricultural college	67
5.1.6 Number of years in operational area	69
5.1.7 Number of years with extension department.	69
5.1.8 Number of years as Front Line Staff	70
5.2 Subject areas in which FLS have trained	70
5.2.1 Crop production.	71
5.2.2 Livestock production.	71
5.2.3 Extension methods.	71
5.2.4 Other subject areas	72
5.3 FLS attendance of in-service training	73
5.3.1 FLS who attend in-service training and reasons why some did not attend	73
5.3.2 In-service training topics	74
5.3.3 Adequacy of in-service training	76

5.4	Induction training	77
5.4.1	Number of FLS who had induction training	77
5.4.2	Content of induction training	78
5.4.3	Importance of induction training	78
5.5	Higher In-service training	79
5.6	Perception of FLS on extent of training received in the various agricultural areas	81
5.7	Classification of FLS into having wide or narrow span of knowledge	82
5.8	Relationship between number of types of training and level of knowledge of FLS have received	85
5.8.1	Relationship between attendance of higher institution and span of knowledge of Front Line Staff	85
5.8.2	Relationship between attendance of monthly in-service training and span of knowledge of Front Line Staff have received	86
5.8.3	Relationship between attendance of induction training and level of knowledge of Front Line Staff have received	87
5.9	Relationship between some personal characteristics and level of knowledge of Front Line Staff	88
5.9.1	Relationship between gender of FLS and level of knowledge received	88
5.9.2	Relationship between marital status of FLS and level of knowledge received	88
5.9.3	Relationship between year of completion of agricultural college	89

and level of knowledge FLS have received.

5.9.4	Relationship between number of years in operational area and level of knowledge FLS have received	89
5.10	Summary	90
Chapter Six		
Determinants of span of farmers' knowledge		
6.0	Introduction.	94
6.1	Personal and socio-economic characteristics of farmers.	94
6.1.1	Gender of farmers	95
6.1.2	Age of farmers	95
6.1.3	Educational background	96
6.1.4	Source of farm labour	96
6.1.5	Size of extra household labour available to farmers	97
6.1.6	Total farmland available to farmers	98
6.1.7	Total land owned by farmers	98
6.1.8	Farming experience	99
6.1.9	Purpose of farming	99
6.2	Extension contact	100
6.2.1	Frequency of contact	100
6.2.2	Extension methods used by Front Line Staff	101
6.3	Farmers' span of knowledge	101
6.3.1	Farmers' knowledge on technological package for crop	101

production	
6.3.2 Farmers' knowledge on technological package for post-harvest	102
6.3.3 Farmers' knowledge on technological package for agro-forestry	103
practice	
6.3.4 Farmers' knowledge on technological package for livestock	103
production	
6.3.5 Farmers' knowledge on technological package for fish farming	104
6.3.6 Farmers' knowledge on technological package on WIAD	105
activities	
6.3.7 Farmers' knowledge on formation of farmer groups	105
6.3.8 Farmers' knowledge on technological package on business	106
planning	
6.3.9 Farmers' knowledge in technological package on non-traditional	106
farming	
6.3.10 Overall level of knowledge of farmers	107
6.3.11 Distribution of farmers working with Front Line Staff with	108
training covering a wide or narrow span of knowledge	
6.3.12 Relationship between frequency of visits by FLS and farmers	108
overall level of knowledge	
6.3.13 Relationship between number of types of extension methods used	109
by FLS to contact them and overall level of knowledge of farmers	
6.3.14 Relationship between farmers of FLS with wide or narrow span	110
of knowledge and overall level of knowledge of farmers	

6.3.15	Relationship between farmers working with FLS with wide or narrow span of knowledge and frequency of contact with FLS	111
6.3.16	Relationship between farmers working with FLS with wide or narrow span of knowledge and extension methods used by FLS to contact them	111
6.4	Summary	112
 Chapter Seven		
Performance of the Front Line Staff		
7.0	Introduction	114
7.1	Adoption of technologies delivered to farmers	114
7.1.1	Adoption of package on crop production technology	114
7.1.2	Adoption of package on post-harvest technology.	115
7.1.3	Adoption of package on agro-forestry	115
7.1.4	Adoption of package on livestock technology.	116
7.1.5	Adoption of on fish farming technology.	116
7.1.6	Adoption of package on WIAD activities.	117
7.1.7	Adoption of package on group formation	117
7.1.8	Adoption of package on business planning.	118
7.1.9	Adoption of package on non-traditional farming enterprise	118
7.1.10	Summary of the adoption pattern for the various agricultural enterprises	118
7.1.11	Overall adoption pattern of farmers.	120



7.2	Relationship between extension contact and overall adoption pattern of farmers	120
7.2.1	Relationship between frequency of visits by FLS to farmers and overall adoption pattern of farmers	120
7.2.2	Relationship between number of types of extension methods used and overall adoption pattern of farmers	121
7.3	Relationship between farmers of FLS with wide or narrow span of knowledge and overall adoption pattern	122
7.4	Relationship between farmers with wide or narrow span of knowledge and overall adoption pattern of farmers	123
7.5	Relationship between some personal characteristics and overall adoption pattern of farmers	123
7.5.1	Relationship between gender of farmers and overall adoption pattern	124
7.5.2	Relationship between age of farmers and overall adoption pattern	124
7.5.3	Relationship between educational background of farmers and overall adoption pattern	125
7.5.4	Relationship between source of farm labour of farmers and their overall adoption pattern	126
7.5.5	Relationship between size of extra household labour and overall adoption pattern	126
7.5.6	Relationship between total farmland available to farmers and overall adoption pattern	127

7.5.7	Relationship between total land owned by farmers and overall adoption pattern	128
7.5.8	Relationship between purpose of farming and overall adoption pattern	128
7.6	Summary	129
Chapter Eight		
Summary of Discussion, Conclusions and Recommendations		131
8.0	Introduction.	131
8.1	Training needs of farmers	132
8.2	Training received by the Front Line Staff	133
8.3	Determinants of span of farmers' knowledge	138
8.4	Performance of the Front Line Staff	139
8.5	Conclusion	143
8.6	Recommendation	147
References		149
Appendices		158

List of Tables	Page	
Table 2.1	Topics for monthly training session - 1995	35
Table 2.2	Topics for monthly training session - 1996	36
Table 3.1	Main concepts, information required, sources of information and data collection techniques	48
Table 5.1	Age distribution of Front Line Staff	65
Table 5.2	Gender distribution of Front Line Staff	65
Table 5.3	Marital status of Front Line Staff	66
Table 5.4	Agricultural college attended by FLS	67
Table 5.5	Year of completion of agricultural college by FLS	67
Table 5.6	No. of years in operational area	69
Table 5.7	Number of years with the Extension Department	70
Table 5.8	Number of years as Front Line Staff	70
Table 5.9	Nature and source(s) of training Front Line Staff have received	72
Table 5.10	FLS reasons for attending and not attending in-service training under NAEP	73
Table 5.11	In-service training topics mentioned by FLS for 1995	74
Table 5.12	In-service training topics mentioned by FLS for 1996	75
Table 5.13	FLS reasons why in-service training is adequate	76
Table 5.14	FLS reasons why in-service training is inadequate	77
Table 5.15	FLS given induction training	77

Table 5.16	Contents of induction training	78
Table 5.17	FLS view on the importance of induction training	78
Table 5.18	FLS reasons why induction training is important	79
Table 5.19	Front Line Staff who have attended higher institution	80
Table 5.20	Courses taken at higher institution	80
Table 5.21	Content of courses taken at higher institution	81
Table 5.22	FLS perception on the extent of training received in various agricultural areas	82
Table 5.23	Classification of FLS into wide and narrow span of knowledge	84
Table 5.24	Number of types of training and level of knowledge FLS have received	85
Table 5.25	Attendance of higher institution and level of knowledge Front Line Staff have received	86
Table 5.26	Attendance of monthly in-service training and level of knowledge FLS have received	87
Table 5.27	Attendance of induction training and level of knowledge FLS have received	87
Table 5.28	Gender of FLS and level of knowledge Front Line Staff have received	88
Table 5.29	Marital status of FLS and level of knowledge received	89
Table 5.30	Year of completion of agricultural college and level of knowledge of FLS have received	89



Table 5.31	Number of years in operational area and level of knowledge Front Line Staff have received	90
Table 6.1	Gender distribution of farmers	95
Table 6.2	Age distribution of farmers	96
Table 6.3	Educational background of farmers	96
Table 6.4	Source of farm labor	97
Table 6.5	Size of extra household labor available to farmers	97
Table 6.6	Total farmland available to farmers	98
Table 6.7	Categories of land ownership	99
Table 6.8	Farming experience of farmers	99
Table 6.9	Farmers purpose of farming	100
Table 6.10	Frequency of contact from Front Line Staff	100
Table 6.11	Extension methods used by Front Line Staff	101
Table 6.12	Level of knowledge of farmers in crop production	102
Table 6.13	Level of knowledge of farmers in post harvest	102
Table 6.14	Level of knowledge of farmers in agro-forestry package	103
Table 6.15	Level of knowledge of farmers in livestock production	104
Table 6.16	Level of knowledge of farmers in fish farming	104
Table 6.17	Level of knowledge of farmers in WIAD activities	105
Table 6.18	Level of knowledge of farmers in group formation	106
Table 6.19	Level of knowledge of farmers in business planning	106
Table 6.20	Level of knowledge of farmers in non-traditional farming enterprise	107

Table 6.21	Overall level of knowledge of farmers	107
Table 6.22	Farmers working with FLS with wide or narrow span of knowledge	108
Table 6.23	Frequency of visits by FLS and overall level of knowledge of farmers	109
Table 6.24	Number of types of extension methods used and overall level of knowledge of farmers	110
Table 6.25	Farmers of FLS with wide or narrow span of knowledge and overall level of knowledge of farmers	110
Table 6.26	Relationship between farmers of FLS with wide or narrow span knowledge and frequency of contact with FLS	111
Table 6.27	Farmers of FLS with wide or narrow span of knowledge and number of extension methods used by FLS to contact them	112
Table 7. 1	Adoption pattern of crop production technology	115
Table 7.2	Adoption pattern of post-harvest technology	115
Table 7.3	Adoption pattern of agro -forestry technology	116
Table 7.4	Adoption pattern of livestock technology	116
Table 7.5	Adoption pattern of fish farming	117
Table 7.6	Adoption pattern of WIAD activities	117
Table 7.7	Adoption pattern of group formation	117
Table 7.8	Adoption pattern of business planning	118

Table 7.9	Adoption pattern of package for non-traditional farming	118
Table 7.10	Summary of the adoption pattern for the various farming enterprises	119
Table 7.11	Overall adoption pattern of farmers	120
Table 7.12	Frequency of visits by FLS and overall adoption pattern of farmers	121
Table 7.13	Farmers contacted through different extension methods and overall pattern of adoption of technologies	122
Table 7.14	Farmers of FLS with wide or narrow span of knowledge by overall adoption pattern of farmers	122
Table 7.15	Farmers with wide or narrow range of knowledge and overall pattern of adoption of technologies	123
Table 7.16	Gender and overall adoption pattern of farmers	124
Table 7.17	Age and overall adoption pattern of farmers	125
Table 7.18	Educational background and overall adoption of pattern farmers	125
Table 7.19	Source of farm labour and overall adoption pattern of farmers	126
Table 7.20	Size of household labour available and overall adoption pattern of farmers	127
Table 7.21	Total farmland available to farmers and overall adoption pattern	127

Table 7.22	Land ownership and overall adoption pattern of farmers	128
Table 7.23	Purpose of farming and overall adoption pattern	129



List of figures

		Page
Figure 1.1	Theoretical framework for analysing relationship between extension workers' training and performance	11
Figure 4.1	Map of Eastern Region showing the study area	54
Figure 4.2	Time of planting of some major crops in the study area	57
Figure 4.3	Field activities carried out in the study area	58
Figure 5.1	Map of Ghana showing the location of the agricultural colleges	68
Figure 5.2	Agricultural subject areas Front Line Staff have received training in	84
Figure 8.1	Relationship between span of knowledge of Front Line Staff in farmers extension needs, extension contact and personal characteristics of farmers on the adoption pattern of farmers	146

List of appendices

Appendix 1	Interview checklist for farmers	158
Appendix 2	Interview questionnaire for farmers	159
Appendix 3	Interview questionnaire for the Front Line Staff	164

LIST OF ACRONYMS

AEA	Agricultural Extension Agent
ASRP	Agricultural Sector Rehabilitation Project
BMTRM	Bi-Monthly Technical Review Meeting
CIDA	Canadian International Development Agency
DAES	Department of Agricultural Extension Services
FLS	Front Line Staff
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GTZ	<i>Deutsche Gesellschaft Fuer Technische Zusammenarbeit</i>
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
ISSER	Institute of Statistical, Social and Economic Research
MTADP	Medium Term Agricultural Development Plan
MOFA	Ministry of Food and Agriculture
NAEP	National Agricultural Extension Project
NGO	Non Governmental Organisation
OFY	Operation Feed Yourself
PPMED	Policy Planning Monitoring and Evaluation Department
SAA	Sasakawa African Association
SPSS	Statistical Package for the Social Scientist
SMS	Subject Matter Specialist
T&V	Training and Visit

UGFCC **United Ghana Farmers' Co-operative Council**
URADEP **Upper Region Agricultural Development Project**
VORADEP **Volta Region Agricultural Development Project**

CHAPTER ONE

BACKGROUND

1.0 Introduction

The chapter on the background to this study-the effect of training on extension workers' performance, describes the role agriculture plays in the development of Ghana's economy, the role that agricultural extension has played, the different extension approaches up to date in Ghana and the experiences that have been derived from the various extension approaches. This is followed by the research problem, research question, objective, theoretical framework, research hypothesis for the study and the definition of concepts used in the research.

1.1 Role of agriculture in Ghana

The role that agriculture plays in the economy of Ghana is significant. The pre-eminence that agriculture enjoys in the economy makes it mandatory that its development should receive the highest attention in the planning strategy. Agriculture used to contribute about 50% of the gross domestic product and employs about 85% of the total population. Its contribution to the foreign exchange earnings of the country was about 62%. Agriculture also produces 62% of the industrial raw materials for the country's agro-based industries (PPMED,1991). Because of this many appropriate policy objectives and programmes have been put in place in the following areas:- crops, other than cocoa, cocoa, livestock, fisheries, mechanisation and irrigation.

Analysis of production levels of major food crops such as cereals, starchy staples, pulses, nuts, oil seed, vegetables, fruits, industrial crops and now non-traditional export crops, show that growth and development of the agricultural sector of the economy have been relatively slow (World Bank, 1992). The factors which have contributed to slow pace of growth and development of the agriculture sector are improper land tenure system, poor land preparation and cultivation, lack of infrastructural facilities such as access road, storage facilities, distribution and marketing, non-availability of watering facilities for all year farming, lack of agricultural manpower, lack of agricultural credit, inadequate agricultural research and dissemination of its result and last but not the least inadequate inputs and extension services.

Successive governments have used different strategies and policies in an attempt to improve the performance of the agricultural sector. In 1972, the ‘Operation Feed Yourself’(OFY) policy was launched aimed at improving the agricultural sector. Essilfie-Conduah (1991) indicated that the OFY achieved a first season success only. In 1990, because of the government’s long term objectives for the agricultural sector, the Medium Term Agricultural Development Plan (MTADP) was formulated with the assistance of the World Bank (Ministry of Agriculture, 1991) to address food security, higher unemployment and low incomes in rural areas, regional unbalanced growth and the contribution of the sector to GDP, foreign exchange earnings and government revenue.

The strategy was predicted on the premises that the Ghanaian farmers will respond to suitable incentives to increase production of both cash and food crops. The

strategy for the promotion of growth of crops was based on increasing productivity using improved technology through the use of improved varieties and crop protection measures while maintaining soil fertility through fertiliser use and soil conserving cultural practices. The irrigation strategy focused on the development of small-scale and micro-scale schemes, improved management of flood plains and an optimum use of existing irrigation facilities. Emphasis was given to the implementation and management of the schemes by the farmers themselves by establishing farmers' groups and training them in soil and water management and in agronomic practices for irrigated crops.

In the livestock sector, the strategy was based on improving productivity through improved animal health, nutrition and water supplies and in the long term, breed improvement. The focus of action under the strategy would be the livestock owner. Crossbreeding to improve the potential of local breeds has been undertaken by using breeds from the sub-region. However, the programme has so far benefited a limited number of farmers primarily due to lack of breeding stock and effective extension work to increase farmers' awareness. Farmers would be trained in rearing improved breeds and the use of animal traction. In the fisheries sector, emphasis would be on the development of inland fisheries, both on the Volta Lake and in aquaculture (Ministry of Agriculture, 1991).

But the agriculture sector as indicated by PPMED(1991) shows that it is dominated by small-scale farmers who constitute about 85% of the farming population and whose holdings, scattered over any agricultural area, do not often exceed two hectares per farm family. These small scale farmers, most of whom are illiterates,

will not ordinarily have access to research findings and technical innovations. Therefore a strategy to strengthen agricultural support services including research and extension (Government of Ghana, 1977, Ministry of Agriculture, 1991, World Bank, 1992) is one of the means which most farmers will have access to technical information necessary to enhance the performance of the agricultural sector. Reitsma and Kleinpenning (1989) indicated that development which has occurred in the rich countries during the past few centuries clearly demonstrate the tremendous importance of productive agricultural sector and a reasonably prosperous rural population. What then makes the development of the extension sector very important?

1.2 Role of agricultural extension in Ghana

Different authors for example Maunder (1973) and FAO (1984a) have given various definitions for extension. However Radhakrishna and Yoder (1988) defined agricultural extension as one of the largest problem-solving, nonformal educational systems in the world and has long been regarded as a vehicle for agricultural development in many nations of the 'Third World'. The major goal of agricultural extension has been to provide the practical knowledge, skills and technology needed by rural people to improve their quality of life and subsequently increase the economic viability of their nation.

Agricultural extension started as far back as 1920 (Twum-Barima, 1977) in the Gold Coast. Although the primary interest was initially on export crops (notably oil palm, rubber and cocoa) greater emphasis was given later to food crops and livestock. This led to the establishment of the Department of Agricultural Extension Services

(DAES) in the Ministry of Agriculture in 1987 to consolidate all non-cocoa public agricultural extension messages to the farmer through one agent. This was aimed at removing the kind of confusion the farmers found themselves in through the many visits they received from the different agricultural workers and which was found to be counter productive to agricultural development.

Agricultural extension was part of the activities of church missionaries and foreign owned companies interested in the production of export crops. Since independence, Ghana has experimented with various approaches of agricultural extension under the co-operative movements, church related development schemes and several donor assisted projects. The United Ghana Farmer's Co-operative Council (UGFCC) started to provide extension service in the early 1960's. The more recent and prominent experiences are the extension programmes initiated under the World Bank assisted Upper Region Agricultural Development Project (URADEP) during 1976-84, Volta Region Agricultural Development Project (VORADEP) during 1982-88 and the Agricultural Services Rehabilitation Project (ASRP), on-going since 1987, the Global 2000, which is supported by a Japanese Non-Governmental Organisation since 1986, and the CIDA assisted Grains and Legumes Development Project, on-going since 1981.

Moreover there have been regional rural development projects which have a substantial extension component e.g. the UNDP/FAO assisted Integrated Agricultural Development programme at Mampong in Ashanti Region during 1986-1989, the GTZ assisted Ghanaian-German Agricultural Development Project



(ongoing since the early 1970's) and the IFAD assisted Small holder Rehabilitation and Development Programme, ongoing since 1988, both in the Northern Region.

1.3 Experiences from the various extension approaches

The World Bank funded URADEP and VORADEP succeeded in introducing the Training and Visit (T & V) system. Many farmers benefited from regular visits of extension, however they could not adopt the extension recommendations as they did not have the needed resources to purchase inputs particularly fertiliser, which was the key component. Under the Sasakawa Global 2000 project, maize yields increased significantly and in most cases yields more than doubled. The number of participating farmers increased rapidly from 40 in 1986 to 20,000 in 1988 and by 1989 it had increased to 85,000 (World Bank,1992). However the problem of loan repayment and other non-extension functions deviated the extension officers from their main extension activities. Notwithstanding these various agricultural policies and extension strategies put in place to enhance the performance of the agricultural sector, the level of modern agricultural technology adopted by farmers in Ghana is low (World Bank, 1992).

The net result is that agriculture has lost its lead in the Ghanaian economy and thus the services sector has become the largest sector of the economy with a share of 48.4% of GDP, followed by the agricultural sector with 40.6% of GDP and industry with 14.2% GDP (ISSER, 1997). Among the various reasons assigned for the poor level of adoption of technology by farmers in Ghana is the weak extension system with poor training leading to poor capacity to diagnose farmers needs (World Bank, 1992). To overcome these constraints, the World Bank in collaboration with the

Government of Ghana initiated the National Agricultural Extension Project (NAEP) in 1993. Among others the Front Line extension staff who are in direct contact with the farmers are given regular monthly training on specific topics on which they also go to train their farmers. The poor performance of agriculture suggest that the expected impact of the regular training of the FLS on their performance is not being achieved, thus requiring critical investigation.

The efforts to improve the agricultural sector has been tremendous. International donors like the World Bank, IMF and Non Governmental Organisations (NGO's) as well as the Government of Ghana have continuously supported training component for the extension worker. Under National Agricultural Extension Project (NAEP), the Ministry of Food and Agriculture organises various courses of training for the Subject Matter Specialist (SMS's) and the Front Line Staff (FLS) who are now called Agricultural Extension Agents (AEA's) at systematic and definite times. This training schedule covers all the Bimonthly Technical Review Meetings (BMTRM's), Agricultural Extension Agents Monthly Training sessions and Subject Matter Specialist (SMS's) Centre Workshops for the year. The BMTRM is the main activity of in-service training for the Subject Matter Specialists (SMS's) and also regular meeting point between Researchers, SMS's and Extension Workers. It always precedes training of FLS at monthly training.

It is useful at preparing the SMS with relevant knowledge and methodology for the execution of the training activities. Resource persons are invited from the Research Institutions and Universities to take the SMS through recent methods and technologies to be imparted to FLS and subsequently the farmers. These meetings

are held once in every two (2) months and last for two (2) days. The Monthly Training Meeting is the main period of in-service training for the FLS by SMS's and Extension Workers. During these meetings the SMS's review the rate of adoption of recommended practices by farmers and problems from the field. They discuss recommended practices for the major crops, livestock, fisheries and select for each recommendation, few impact points on which the FLS's should focus the farmers' attention. The meetings are held on a fixed day every month and last for a day.

The observation that, the performance of the agricultural sector, is far from expected, raises questions as to whether the increases in the number of training given to extension workers per se enhances performance of the extension workers. And whether the nature and content are not equally important. This is the focus of the study.

1.4 Research problem

Extension workers' performance as observed is lower than expected (World Bank, 1992). Various ways have been provided to enhance performance. Among these, is the provision of training to farmers based on their needs. To be able to do this, extension workers may have to be trained in identifying farmers' needs. The training that FLS get is likely to enable them train farmers appropriately based on their needs. It can be expected that when this happens the performance of the extension worker is likely to be higher. To what extent is this so?

1.5 Main research question

Does the content of training provided to the extension workers affect their performance. And if so which content is likely to enhance extension worker performance?

1.5.1 Specific research questions

1. What are the training needs of farmers the FLS work with in the study area?
2. What are the contents of the training received by the FLS at the pre-service, induction, and in-service periods?
3. What are the nature and content of training farmers have received from the FLS?
4. What is the relationship between content of training FLS received and their performance as indicated by the adoption levels of their farmers?

1.6 General objectives

The overall objective of this study is to determine the nature and content of extension training (pre-service, induction, in-service) and the extent to which it has enhanced the performance of Front Line Staff in the study area.

1.6.1 Specific objectives

1. To determine farmers training needs in the area of technical messages and activities.
2. To find out the contents of the training programmes received by the Front Line Staff at the pre-service, induction and in-service periods.
3. To identify the nature and content of training farmers have received from the Front Line Staff.

4. To determine the relationship between the content of extension workers' training and the adoption levels of their farmers.

1.7 Theoretical framework

Farmers have training needs. In order for extension workers to provide appropriate extension programmes to their farmers, the extension workers should also have received training which addresses the extension needs of their farmers. When extension workers have been trained in these needs, they are likely to provide extension messages to farmers which are appropriate to their needs. The likelihood is that there will be higher levels of adoption of extension messages. The framework is shown diagrammatically in Figure 1.1

1.8 Research hypothesis

- i. Training that different Front Line Staff (FLS) have received addresses farmers' extension needs for technical messages to different extent.
- ii. The content of programmes that extension workers give to farmers is positively related to the content of training the FLS have received.
- iii. Performance of the Front Line Staff as indicated by adoption level of their farmers is positively related to the extent that the training they received address the extension needs of their farmers.



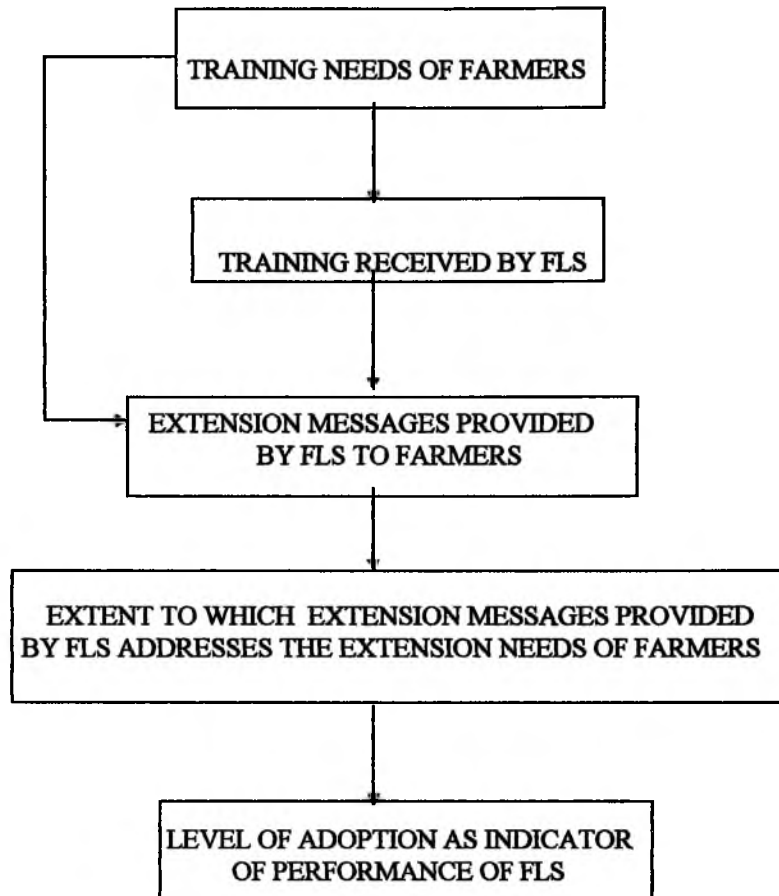


FIG.1.1: THEORETICAL FRAMEWORK FOR ANALYSING RELATIONSHIP BETWEEN EXTENSION WORKERS' TRAINING AND PERFORMANCE

1.9 Significance of the research

It is envisaged that the findings and conclusions of this research will help identify areas of training required by the Front Line Staff that will help meet the extension needs of the farmers and thereby enhance the performance of the Front Line Staff in the field. The information will help extension administrators, supervisors, Subject Matter Specialist and Training Officers to upgrade the existing training programmes, especially in-service training programmes to enable the Front Line Staff meet the needs of their farmers.

1.10 Definition of concepts

Training

The systematic development of attitude, knowledge and skill behaviour pattern required by the FLS during the pre-service, in-service and induction training sessions in order to perform their task adequately.

Farmers' Need

The messages on technologies and innovations required, and the means (methods and channels) through which the messages are sent to them.

Performance of Front Line Staff

Performance of the Front Line Staff is measured by the pattern or level of adoption (i. e. full adoption, partial adoption and non adoption) of innovations by farmers.

Front Line Staff

This is the agricultural extension worker who is trained to impart technology to farmers. They are also called agricultural extension agents and more often than not they are known as FLS.

Knowledge

Information learned and remembered by FLS through training.

Attitude

It is the feeling of like, dislike, attraction, repulsion, interest, or apathy by the Front Line Staff towards other people (i.e. farmers), objects, situations or ideas.

Skill

The level of proficiency attained in carrying out extension duties in a consistent way by the Front Line Staff.

Various aspects are examined in subsequent chapters. In Chapter Two literature on training of the agriculture worker in general is reviewed by looking at the types of training, the roles expected of them and the competencies required of them to perform these roles. It outlines the type of training given to the agricultural workers in Ghana. There is also a brief information on factors that affect adoption of innovation and problems of training. In chapter Three, the methodology for the research, specifically, the population for the study, data collection instruments techniques and procedures, and data analysis are described.

Chapter Four describes the background to the study area and the training needs of farmers. Chapter Five identifies and describes the nature and content of training the Front Line Staff have received in the area of crops, livestock, extension and other areas. Chapter Six examines the personal and socio-economic characteristics of the farmers who work with the Front Line Staff. It also describes the knowledge of the farmers in the various technological packages in agriculture. The relationships between categories of farmers and their level of knowledge in various technologies presented to them are also shown.

Chapter Seven describes the performance of the Front Line Staff by examining the pattern of adoption of their farmers of the various technological packages introduced to them by the FLS. It also looks at the relationship between some personal and socio-economic characteristics of farmers and adoption for various packages in agriculture. Finally Chapter Eight summarises the discussions on training needs of the farmers in the study area, training received by the Front Line Staff at both the pre-service and in-service training sessions, the nature and content of training farmers have received and knowledge levels of farmers in the various technological packages presented by the FLS. It also gives the conclusions and outlines recommendations from the research.

CHAPTER TWO

LITERATURE REVIEW: TRAINING AND PERFORMANCE OF AGRICULTURAL WORKERS

2.0 Introduction

This chapter looks at the importance of training. It also shows the various perspectives on workers' job performance, factors which affect workers' job performance and the justification for training as an important area likely to highly affect job performance. The nature of training received by the FLS, the role of the FLS and competencies they required to perform their work are also discussed.

2.1 Importance of training

Modern farming has brought with it new technologies and innovations for farmers to apply and improve their farming practices. Some of these innovations are planting in rows, use of new varieties of crops and livestock, use of fertiliser, post harvest practices and agro-forestry to mention a few. In Ghana the bulk of the population who are farmers, live in the rural areas. They are usually not in close contact with any educational institution and are likely to remain without education, training or information needed for improvement in their living conditions.

Knowledge tends to accumulate in research centres, laboratories, official documents and government reports. Even though Stavis (1979) indicated that farmers get information from friends, relatives, skilled local farmers, merchants and salesmen

etc.. He (Stavis, 1979) called this information network a 'spontaneous extension system' and was quick to say that efforts should be made to find how formal extension can make a crucial initial input and take advantages of the 'spontaneous extension system'. This concluding remark of Stavis points to the importance of agricultural extension in agricultural development.

Agunga (1994) proposed that extension is best-suited to facilitate the development process and to play a key role in development. But the fact cannot be denied that other agricultural support services like the research, input sellers, and banks also contribute to agricultural development. Agricultural extension service serves as a link between farmers and the other support services. The unique position of the extension service makes it imperative that their staff are trained with the right knowledge, skills and attitudes to cope with their herculean task of linking farmers to the other stakeholders in agriculture. In conclusion, the nature of the needs of the farming population necessitates an agricultural extension service whose workers are well trained. It is believed that if they are appropriately trained, their performance will be enhanced.

2.2 Different perspective on worker job performance

"It may be difficult for me to determine if you are effective at your job, however I can tell if you are at work on time, if you look busy, if you are pleasant and agreeable, or if you respect authority. While these characteristics may or may not have a relationship to performance per se. So what we often find in organisations is the use of one or more proxies for performance" (Robbins, 1978 in Torrington and Weightman, 1985:232).

As a result of the difficulty in measuring performance in real terms, performance is measured by proxy (Torrington and Weightman, 1985). Therefore the way of measuring performance will be different for different organisations. An appropriate measure of performance of the agricultural extension worker will be the number of innovations farmers will adopt. This is in agreement with World Bank's (1992) indicator of performance of the agricultural sector. But performance as has been seen from the various perspective will not just come from the vacuum. Certain factors which will be discussed in the following section have to be considered before their achievement. What then are these factors?.

2.3 Factors which affect workers job performance

No two people in an organisation can be said to have the same qualities. They may differ in age, sex, educational status, marital status, etc.. However in any organisation, there are such different individuals who operate together. Schneider (1976) indicated that organisations recruit and select people on the basis of their estimated potential to achieve certain desired levels of performance. Industrial psychologists have for years attempted to predict individual characteristics which best predict performance on the job. While these attempts have been somewhat successful, the correlation between individual characteristics and performance criteria have at best been moderate, while the relationship between individual characteristics and more ultimate organisational performance criteria is often non-existence. Hackman & Lawler (1971) indicated that in a steel mill, the individual needs, abilities, and skills to increase productivity by 32% were present all along, but organisational arrangements to allow this potential to be unleashed were not.

The importance of organisational arrangements in eliciting full human potential probably increases with the complexity of the task and the required co-ordination. For the notion of individual/organisation fits to be operationally useful, a social system model of organisation must at least specify which individual characteristics are important for a manager to examine and take into account in attempts to improve organisations. McGregor (1967) indicated that it is often useful to distinguish between the 'can do' or ability components of performance and the 'will do' or motivational components of performance. Some managers tend to emphasise one component to the exclusion of the other, thus missing the fact that performance is a function of an interaction between abilities and motivation.

McGregor (1967) conceptualized the relationship as follows: $P=M \times A$, where P = performance, M =motivation, and A =abilities. Motivation could be in the form of good remuneration, end of year bonuses, and other logistic support. Many people leave their work for another because of good motivation expected. Observed evidence replete in this country as to workers changing job on motivational factors, e.g. civil servants always leave for private organisations and non-governmental organisations. Evidence from literature also shows that the Automotive Industries Council (1990) finds that 'work motivation directly affects productivity and quality.....(employee) motivation appears to be at least as important as skill in improving productivity'. Business Council of Australia (1986) indicated that whatever the natural resources, the financial capital, the technology or the skills that can be brought together to support economic and business productivity, there remains another element, that of 'the interest, commitment and overall motivation of the workforce'.



In **summary**, motivation of workers has an important effect on their performance, however the ability of the workers cannot be left out if performance is to be enhanced. Beer (1980) wrote that it seems rather clear that individuals do differ in abilities and skills and that these differences limit their capacity to respond to various situations. Differences in ability seem to fall into three primary categories; physical abilities, mental abilities and interpersonal skills. Obviously, the required mix of these three dimensions and their various sub-components together with experience and education, will differ for each job. Notwithstanding the differences in need for training for the different workers, training per se serves as an important component in any organisation. Nobody was born a teacher, nurse, tailor, agricultural extension worker, or a pilot but they all have come by their profession through training.

2.4 Justification for training as an important area likely to highly affect job performance

From the discussion so far, even though personal characteristics, motivation and ability affect performance of workers, there was ample evidence that relationship between personal characteristics and performance is often non-existent. There can also be variations in the kind of motivation given to workers in different organisations and in the end will or may not affect performance. However without training no organisation can function well. Changes in the types of machines used in various organisations over time requires that workers are given training to **match** these changes if the performance of the organisation is to be sustained or enhanced. In such situation, no matter the kind of motivation given, if appropriate training is not given, performance of workers in the organisation is likely to decline.

In this same vein, because farmers now live in a dynamic society, have their needs **changing** as they are moving from the subsistence type of farming to the medium/large scale level of farming and are shifting from the cultivation/rearing of the old varieties/breeds to the new ones as well as export oriented crops which come with attendant problems of pest and diseases, then change in the training of the Front Line Staff should be anticipated.

Beer (1980) showed that there are four organisational components which must be congruent: people, organisational process, organisational structure, and organisational environment (which include the customers) implying that any change in the customers taste, affects the other factors. Taking a cue from this, it means that if there is a need for change in the lives of farmers as a result of technological changes, then there should also be a correspondent change in the knowledge, attitudes and skills of the agricultural extension worker to be able to adjust to the change in farmers. Since the measure of performance of the agricultural extension worker was based on farmers' adoption of technological innovations brought to them by the agricultural worker, then it is believed that if the training of agricultural extension workers are based on the training content of farmers' needs, there is the likelihood of enhancing the performance of the agricultural extension workers.

2.5 Evidence on training content and worker job performance

Training of agricultural extension workers becomes more and more important if they are to be effective and efficient. Good training has become an essential aid to good management by teaching the individual employee what is the best method in his own interest and in the interest of his working group, and also by giving him confidence

that everything is being done to make his task as simple, yet as effective as possible. The complaint by farmers about their lack of contact with extension staff of the Ministry of Agriculture, and the lack of information about the supply of vital agricultural inputs such as seeds, fertilisers and hand tools they urgently need for their farming activities triggered the conduct of an in-service training programme for the extension staff of the Ministry of agriculture in 1973 (Bortei-Doku, 1984).

In evaluating the project, he, (Bortei-Doku, 1984) indicated that there was no doubt that the training did a great deal of good in improving the morale of the field staff and in putting new life into their work. He further remarked that notwithstanding the amounts spent, the expenditure was well worth improvement seen in the performance of extension officers in the field.

Training is best seen as an incentive to the employees and such an incentive can enhance organisational commitment, team effort, customer relations etc. However, on the “pure” individual level without encroaching upon an organisational impact, innate incentives can be realised through training. For example, the right skills and knowledge can mean job transferability, job promotion, job enhancement and greater job interest. The individual benefits would emphasise the growth in human capacities through the effective use of skills and abilities at work which, in turn, would give greater social relevance to the nature of the job in the community at large. Enhanced productivity and profitability would be the motivation and spin-off expected by the organisation. The result of training is more efficient use of resources available (to the Front Line Staff), less waste, better quality services, the

maintenance of sound customer relationship and higher performance levels (Anderson, 1993).

Based on the identified training needs and available training institutions, training in management and technical skills offered to a wide range of groups enabled them to improve their work performance. Mtunzi, (1990) concluded from his work that training is both an incentive and motivation for better job performance. Bhople and Patki (1992) also observed no difference in the role expectation of the farmers and role performance by farmers. The performance of women coming from poor and backward castes with no formal education was highest, as were their training needs. To summarise, training based on needs of the target group is likely to enhance performance. What kind of training is given to the agricultural extension workers to enable them play their role effectively?

2.6 Role of the Front Line Staff as change agents

Havelock and Havelock (1973) analysed the role of the change agent in the change process and said regardless of the formal job title and his position, there are four primary ways in which a person can act as a change agent: He can be (i.) A Catalyst (ii.) A Solution giver (iii.) A Process helper (iv.) A Resource linker

A catalyst

Most of the time people do not want change, they want to keep things the way they are even when outsiders know that change is required. For that reason, some change agents are needed just to overcome this inertia, to prod and pressure the system to be less complacent and to start working on its serious problems. The Front Line Staff

(FLS) does not necessarily have answers, but becomes dissatisfied with the way things are. By making his dissatisfaction known and upsetting the “status quo” he energises the problem-solving process.

A solution giver

Many people who want to bring about change have definite ideas about what the change should be. They have solutions and they would like others adopt those solutions. However, being an effective solution giver involves more than simply having solution. You have to know when and how to offer it, and you have to know enough about it to help the client adopt to his needs.

A process helper

A critical and often neglected role is that of helper in the processes of problem - solving and innovating. Because clients are not experts on the “how to change”, they can be greatly helped by people who are skilled in the various stages of problem solving. The process helper can provide valuable assistance in:

- (a) Showing the client how to recognise and define needs.
- (b) Showing the client how to diagnose problems and set objective.
- (c) Showing the client how to acquire relevant resources.
- (d) Showing the client how to select or create solutions.
- (e) Showing the client how to adopt and install solutions.
- (f) Showing the client how to evaluate solutions to determine if they are satisfying his needs.

A resource linker

Effective problem-solving requires the bringing together of needs and resources. “Resources” can be of many kinds: Financial backing, knowledge and skills in diagnosing problems, formulating and adopting solutions and expertise on the process of change itself. Resources may also consist of people with time, energy and motivation to help. A very special and underrated change role is that of the “linker”, i.e. the person who brings people together, who helps clients find and make the best use of resources inside and outside their own system. In summary, after knowing the role that they play, it is important that the competencies that will make them achieve these roles are discussed.



2.7 Competencies required for the extension worker to perform task

Although many developing countries have serious shortages of trained personnel in the fields related to agriculture, considerable progress has been made during the last three decades. By 1983, for example, there were over 400,000 trained agricultural personnel in 46 developing countries in Africa (FAO,1984b).

The low levels of productivity in agricultural sectors of many African countries together with the rising population necessitate urgent action. Institutions of higher agricultural training are responsible for the generation and transmission of technical information as well as training of staff. Trained staff must have strong academic background but practical and relevant orientation should be vigorously pursued. Attention should be paid to developing communication skills which at present are lacking.

Furthermore, graduates of higher agricultural institutions must be taught the importance of modifying technical information in the light of individual farmers circumstances rather than relying on blanket recommendations alone (Gatere, 1986/87). The number and quality of trained technical and professional personnel in agriculture are critical factors. This “human capital” is relatively scarce since training takes years to complete and is costly. However, investing in technical and professional education has higher multiplier effect when trained personnel are properly employed as extension agents, trainers, researchers, programme managers and policy makers (Cornwell, Guijt and Welbourn 1993; Pretty and Chambers, 1993; Scoones and Thompson, 1993).

The poor training of agricultural extension staff has been identified as part of the problem of the relative ineffectiveness of much extension in the field, and changes in training are seen as part of the answer to this problem. Moreover, changes in our understanding of “development” particularly the concept of participation, and of learning especially what is called “critical reflection”, have created a need to rethink the training of extension workers (Cornwell, Guijt and Welbourn 1993; Pretty and Chambers, 1993; Scoones and Thompson, 1993).

For training to be effective, relevant and efficient, a proper assessment of needs should be established prior to the formulation of a training programme (Singh and Gill, 1982). Effective training programmes must use research findings of needs assessment and conditions of the environment for the effective and practical learning (Smith and Haverkamp, 1977). Mager and Pipe (1970) indicated that training needs assessment should be conducted so that only the real performance discrepancies are

identified. More and Dutton (1978) indicated that “training needs assessment should be conducted within the scope of organisational objectives and based on competencies required to perform a task so that the findings could be used as a basis of planning for a better operation”.

Rivera and Gustafson (1991) reported that extension must be responsive to be effective. To be effective at responding to the needs requires up-to-date skills and knowledge. Carter (1973) pointed out that the problem of how to integrate behavioural and technological components in extension education programmes was still unsolved. The balance between the social and technical aspects of agriculture in the training of extension advisers is critical to their success (Hawkins, 1981).

A common belief of many people is that anybody with a knowledge in agriculture could impart it to farmers for use. Maunder (1973) however indicated that the ability to communicate determines to a very large degree the success or failure of an extension worker. MacDonald and Hearle (1984) also wrote that for change agents to be effective in their work, they must combine their technical knowledge with communication skills. Stevens (1981) indicated that the training needs for extension personnel identified by Williams (1977) were as follows: Agricultural technical competence, Understanding of the extension service, Human relations, Programme planning, Counselling and guidance, Communication principles, teaching and techniques, Social structures, Leadership, Social evolution options and processes, Principles of work organisation, Administration and supervision and Evaluation principles and techniques.

In another development, Rucks (1981) noted that if one aim of the extension service is to produce farmers and peasants able to manage a farm efficiently, then training of extension workers should be aimed at producing those who can keep a few steps ahead of the farmers and peasant they are advising. This applies to attitudes, knowledge and skills connected with the organisation, administration, and actual production of the agricultural enterprise. The training programmes designed to produce extension workers must therefore contain the following: (a) Methodologies for identifying the problems and resources of a given area through participation of the local population, (b) Organisation and action at community level, (c) organisation and administration of a farm, (d) Planning and production of a farm, (e) Production techniques for the zone's main agricultural products and (f) Methodology for communicating to farmers and peasants.

Rucks (1981) again wrote that the experience in Honduras and El Salvador have shown conclusively that extension workers should have a level of technical competence such as would be obtained through completion of a degree or diploma course in general agriculture. In addition they should have completed an extension course that has as its basic, many or all of the elements listed above. Carter (1983) and Maunder (1973) all agree that the extension workers require special knowledge or competencies in a number of broad areas to be able to perform their task efficiently and effectively. Maunder (1973) identified seven areas of competency required by the extension worker apart from the technical subject matter. These are i.) Extension Service Organisation and operation, ii.) Human Development, iii.) Programme Development, iv.) The Education Process, v.) Social system vi.) Communication, vii.) Research and Evaluation.



Technical subject matter

Leagans (1964) says “to undertake to teach what one does not know is to invite failure from the start”. An extension worker must have thorough knowledge of the technical information appropriate to his job and must keep abreast of current materials. To do this he must know reliable sources of information. Furthermore he must understand how subject matter relates to problems of farming and living.

Extension service organisation and operation

Every extension worker needs to know the objectives of the services, understand its organisation, be familiar with its policies and understand office management, business procedures, personnel responsibilities and qualification at all level.

Human development

The Front Line Staff required understanding of the human development process, behaviour pattern, group dynamics, group interactions and skills in human relations. His success depends to a large extent upon the relationships he develops and maintains with farmers and villagers, local leaders, his colleagues in the extension service and with officials of other agencies or services.

Programme development

Development, executing and evaluating educational programmes in co-operation with local people is the basic function of field extension workers. All extension personnel must understand the process involved in order to make their respective contributions.

The education process

It involves the principles of learning, the learning process, how to motivate people and the methods and techniques of teaching.

Social system

To work effectively with his people an extension worker needs to understand basic social organisation including reference groups (family, church community, power structure, how to identify local culture, social economic, etc.) how to identify and develop leaders, group and social action process.

Communication

The ability to communicate effectively can be developed and improved. It involves speaking, writing, counselling, demonstrating and the use of group and mass methods.

Research and evaluation

Extension personnel need to be able to measure the effectiveness of programmes and methods used to understand the experimental approach and to assist people in evaluating their own effort.

2.8 Types of training

Maunder (1973) identified four types of training essential to produce capable field extension workers. These include Pre-service Training, In-service Training, Induction Training, and Graduate Studies.

Pre-service training

This refers to the professional training received prior to appointment to the extension service. It includes a certificate in agriculture, diploma in agriculture or bachelor of science degree in agriculture or home science.

Induction training

This is the training given to new extension personnel after they have been employed and before they are assigned to work in a particular area. It is a type of special training to prepare them for their particular jobs and to give them understanding of what agricultural extension is, its principle, objectives and philosophy, and methods of teaching farm people the improved practices recommended by extension service. Induction training for all new extension personnel should develop an attitude of personnel dedication to the service of rural people. This kind of training is to supplement whatever pre-service training the new personnel may have had.

In-service training

New agricultural technologies leads to continual improvements in crop and animal production. Extension agents may receive the best pre-service training, but they still need to update their knowledge periodically through in-service training programmes. Benor and Harrison (1977) expressed the view that “most training efforts are concentrated on pre-service training which often is too theoretical and provide little opportunity to apply in practice what has been learned”. Furthermore they contended that “pre-service training usually seek to cover a whole range or crop and practices... few extension agents can remember all these for long”.

The purpose of in-service training may be summarised as follows:

- i. To cope with the constant changes in the problems of farming in a given locality.
- ii. To cope with the constant changes in agricultural knowledge, technology and farm improvement.
- iii. To make adjustments to changes in the pattern of behaviour of extension beneficiaries.
- iv. To learn aspects of extension work not covered during the basic training period and to learn about new procedures, approaches, techniques and teaching aids in extension work. It will be evident that in-service training has to be conducted for different purposes, with different subject matter, for different duration and by different trainers.

Graduate studies

After serving for a period in the extension service many extension workers feel the need for additional academic training either to improve performance in their present positions or to qualify for promotion. Those aspiring to be subject matter specialists will take course leading to Master of Science degree in chosen technical field with additional extension education. Others will concentrate on the field of extension education with most of their courses in social science.

2.9 Types of in-service training

These are some of the alternative forms of in-service training for agricultural extension workers.

Regular in-service training

A good example is the fortnightly training sessions in the “Training and Visit” (T & V) approach to extension. The sessions are scheduled over a long period of time and the subjects to be covered are planned well in advance and follow the sequence of farm co-operations in giving a certain crop. Another example is the regular meeting held by extension supervisors at the district or provincial level.

Special in-service training

When a country adopts a new agricultural production programme such as agro-forestry practices, special in-service training is given practically to all agricultural extension agent. In this way they can cope with all the technical and procedural requirements of a new Ministry of Agriculture policy and a new extension programme.

Co-operative in-service training

This is a co-operative arrangement between the agricultural extension service and accredited colleges of agriculture and agricultural research institutions in which the institutions conduct in-service training agreed upon for both extension agents and subject matter specialist. This kind of in-service training normally takes from one to four months depending on the training need. Generally this form of training is appropriate for the training of trainers and of subject matter specialist.

In-service training on study leave

This is practised in only few developing countries. Through fellowships, the extension staff are given leave from their work to follow a degree programmes or other special study. This may be undertaken within the country or abroad. Another example is to allow extension staff to take a brief study leave for specially arranged course (technical or pedagogical) in accredited training institute.

2.10 Training of agricultural workers in Ghana

The types of training the Front Line Staff is supposed to go through, i.e. pre-service, induction and in-service, supplement each level on the training needs of the extension workers in the area of competencies that will help them to perform their expected roles. Since agriculture is dynamic, one of the avenues for the agricultural worker to be abreast with the new technological findings and innovations is through the in-service training provided to them.

Before the development and commissioning of the training facilities at Kwadaso Agricultural College in Kumasi, Agricultural Assistants and Forest Rangers had their training at Cadbury Hall, also in Kumasi. The candidates for the training centre were at first recruited from pupils with Middle School Leaving Certificate. Gradually, however, with the general improvement in educational standards the minimum entry requirements were raised to a pass in the West African School Certificate or the Ordinary Level General Certificate of Education (G.C.E.). Their programme was planned to last for three years - a first year of basic sciences, a second year of practical attachment to an Agricultural Research Station and a third year at the

Agricultural Training Centre to do the important aspects of the application of the sciences to the principles and practices experienced in the year of attachment.

The faculty of Agriculture of the University College of Gold Coast was established at Legon in 1952. By 1955, the University College of Gold Coast, as it was then called was the only accredited institution in the country training Agricultural Officers. A young Department of Agriculture was also established in the Kumasi College of Technology, Art and Science. Even though it suffered serious criticisms as to its usefulness, it later came to be the School of Agriculture where courses like Animal Husbandry, Agricultural Entomology, Plant Pathology, Arable Crop Production and Soil Science were taught. (Twum-Barima, 1977).

The Ministry of Agriculture trains its own middle-level extension staff in five post-secondary agricultural training colleges including one for veterinary science. These are Kwadaso Agricultural College in Kumasi, Ejura Agricultural College, Ohawu Agricultural College, Nyankpala Agricultural College and Pong Tamale Veterinary College. Total admission to all the colleges per year is about 300 and selection is by competitive examination. Upon completion of their courses, trainees from the colleges are appointed technical officers by the Ministry of Agriculture and some para-statal bodies. (Bortei-Doku, 1984).

Professional and sub-professional staff of the Ministry of Agriculture are trained in the country's Universities. These are the University of Ghana, University of Cape Coast, Kwame Nkrumah University of Science and Technology and the University of Development Studies. Graduates from these universities hold administrative and managerial positions in the ministry.

Notwithstanding these training, in-service training is provided to staff of the Ministry to upgrade them on current agricultural technologies and innovation. The in-service training takes various forms. There are those which form part of projects as was obtained under URADEP, VORADEP and currently National Agricultural Extension Project (NAEP) where specified training topics are treated by specialist for the knowledge of the Front Line Staff. Some of the training topics treated during the past two years i.e. 1995 and 1996 are shown in Tables 2.1 and 2.2 respectively.

TABLE 2.1. TOPICS FOR MONTHLY IN-SERVICE TRAINING SESSION - 1995

MONTH	TOPIC	ACTION BY
JANUARY	Data Collection Forms & Information Flow.	MIS OFFICER
FEBRUARY	Farm Record Keeping./Extension Communication Skills.	MIS OFFICER
MARCH	Malnutrition - PEM	SMS W.I.A.D.
APRIL	Rangeland Management (Agro-forestry).	SMS CROPS +
MAY	Hygienic Handling of Fish	SMS FISHERIES
JUNE	Determination of Yield Index/Plantain Production.	SMS CROPS
JULY	Safe Use of Agro-chemicals	SMS PPRS
AUGUST	Sugarcane Production	SMS CROPS
SEPTEMBER	Review of Post Harvest Management of Grains	AGRIC. ENG.
OCTOBER	Data Collection Forms	MIS OFFICER
NOVEMBER	Pest & Diseases of Rural Poultry	SMS APD
DECEMBER	Evaluation & Assessment	

+Agro-forestry Unit

Source : Regional Training Officer, Koforidua



TABLE 2.2: TOPICS FOR MONTHLY IN-SERVICE TRAINING SESSIONS - 1996

M O N T H	T O P I C	A C T I O N B Y
JANUARY	-	-
FEBRUARY	-	-
MARCH	Breeding Management in Small Ruminants	SMS APD
APRIL	Integrated Pest Management of Vegetables	SMS PPRSD
MAY	Tilapia Culture	SMS FISHERIES
JUNE	Micro-nutrient Deficiency	SMS WIAD
JULY	Safe Use of Agro-Chemicals/ Extension Communication Skills	SMS PPRS/RTO
AUGUST	Nursery Techniques in tree crops (Mangoes and Citrus)	SMS CROPS
SEPTEMBER	Housing of ruminants and birds	SMS APD
OCTOBER	Use of appropriate Agro-processing techniques and machinery	SMS AESD
NOVEMBER	Management of water-borne diseases	SMS W IAD
DECEMBER	Grasscutter Production	SMS APD

Source: Regional Training Officer, Koforidua

The bulk of the agricultural workers who are in direct contact with farmers are technical officers who have only gone through the agricultural colleges. Only few have University diploma or certificates. However a critical look at the content of the curricula (MOFA, 1995) of the agricultural college (pre-service training) of the extension workers shows that not much attention is put on the teaching of agricultural extension. Rucks (1981), Stevens (1981), Carter (1983) and Maunder (1973) indicated teaching of agricultural extension to be important, apart from the technical subjects. It helps the extension agent to identify farmers training needs and train them.

It reveals that the extension worker should be given the opportunity to pursue diploma course at the University to upgrade their knowledge in the competencies that were not very much covered at the pre-service and induction training periods.

However since only few get this opportunity, the in-service training conducted monthly at the local level should serve the purpose. To make up for the deficiencies, in-service training are organised for the Front Line Staff at the district level. This will equip the Front Line Staff to be able to perform their role efficiently so that they could be able to identify the needs of the farmers.

2.11 Needs of farmers

The needs of a person or a group of persons are the cumulative effect of a host of psychological, social, cultural and physiological factors (Boone, 1985). It is for this reason that the identified community leaders and their followers need to be intensively involved in collaborative identification, assessment and analysis of the needs of the community in extension and other development work. There are many ways by which the extension worker can obtain information about a target community needs. Among these approaches are (i) continuing interfacing with leaders of the community, (ii) listening (iii) surveys (iv) community studies (v) checklists, (vi) questionnaire and (vii) the use of census reports or other compilations of pertinent data (Boone, 1985).

Farmers training needs vary from community to community. This is dependent on the type of vegetation, rainfall, land tenure system, farming systems, cropping farming pattern, ready market and educational background.

Technical messages

Depending on the prevailing factors, needs of farmers could be determined from the following areas; (i) tree crops (ii) food crops (iii) plant protection (iv) cereals (v) vegetables (vi) livestock (vii) poultry (viii) Agro forestry (ix) fisheries (x) home economics and (xi) other non-traditional farming practices. Their needs will include a range of technical knowledge on production, protection, processing and storage of crops, livestock and poultry.

Delivery process

For these technical message to reach farmers effectively, certain methods need to be used. The available methods include various forms of (i) individual (ii) group and (iii) mass extension methods.

Individual methods are important because learning is an individual process so that although extension agents must use group and mass methods to reach large members of people and to stimulate joint action planning and carrying out projects of common interest, personal contacts serve many essential purposes. The personal influence of the extension worker is a vital force in securing co-operation and participation in extension activities and adoption of improved practices on the farm and in the home. Individual methods include farm and home visits, office call, telephone calls, personal letters and informal contacts (Maunder, 1973).

Group Methods include general meetings, meetings for method demonstrations, result demonstrations, farm walk or tours, field days or farmer days at agricultural experiment stations. Group methods are especially effective in moving people from

the interest stage to the trial stage of learning. When the reaction of the majority of the group is favourable, the majority of the members may proceed to the adoption stage. Group extension methods, effectively arranged and conducted, take full advantage of the external and internal forces or group dynamics.

Mass methods include the use of radio, newspapers, magazines, posters, exhibits and printed materials to reach large members of people quickly. These methods are particularly useful in making large numbers of people aware of new ideas and practices or alerting them to sudden emergencies. They serve as an important and valuable function in stimulating farmers interest in new ideas.

Channels of communications i.e visual, spoken and written are used to package the messages through the various methods to farmers. "Seeing is believing" is an axiom of extension education. Picture writing is an ancient form of communication, pictures, chart, diagrams, exhibits and posters perform vital communication functions in most advanced society. Visual and oral channels are about the only ones for extension workers to serve illiterate people.

Spoken channels are useful for all types of extension methods such as farm and home visits, office calls, meeting of all kinds, radio, and television and telephone calls. Except for radio and television, they allow two-way communication, which is a big advantage. Lack of understanding can be detected and cleared up on the spot. Not only words but gestures and expressions of both speaker and listener contribute to clear communication.

Written communication is indispensable in the day-to-day operation of any organisation, including extension service. Technical information and instructions must be distributed to the staff. Records and reports must be prepared, kept available for use and submitted to superiors. The public must be kept informed of activities and accomplishments. Written communication has greater status and carries more authority than oral communication (Maunder,1973).

To enhance the effectiveness of extension services, the training of the Front Line Staff should be such that they will be able to diagnose farmers problems and provide the required solutions as messages, using the appropriate extension methods and channels of communication.

2.12 Problems associated with providing training

Havelock and Havelock (1973) indicated that in considering any sort of training of training activity, the issue of goals is paramount. They suggested that designs, strategies, and procedures are useless unless they are developed for worthwhile ends. Four areas, (a) breadth of goals, (b) relationship of training to the on-going life history of the trainee, (c) psychological wholeness, and (d) transferability are considered relevant.

Breadth of goals

Havelock and Havelock (1973) indicated that experts differ in their specification of the optimum breadth of goals that is appropriate for training. While some say we train only on specific skills or learnings, allowing the trainee to fit them into his life and work, others argue just as strongly that it should be building new roles which

include not only sets of skills but the necessary trappings of status, identity, and social support. Still others feel that it should remake total organizations, train members in “families” and reshape the structure and institutional arrangements so that they are truly self-running system.

Relationship of training to the on-going life history of the trainee

Any training is designed to change something about the person being trained. It should be able to provide entirely new attitudes, knowledge or skills inputs that are largely unique and original as far as the trainee is concerned. It must also provide reinforcement or additional support for attitudes, knowledge and skills already possessed by the trainee as well as eradicate or redirect already existing attitudes, knowledge, or skills which are deemed to be growth-inhibiting.

Psychological wholeness

Psychologists and trainers differ in their judgements of which of three psychological components is more important in training and learning. Nevertheless it has been convenient to make a distinction between “behaviour” i.e. overt and observable physical acts; “cognition” i.e. verbalizable thoughts that seem to be associated with various behaviours, and “affect”, the feelings of pleasing calm, excitement, anxiety, pain, etc. that seem to be associated with either cognition or the behaviour. It is legitimate for a trainer to choose from among these three, however the trainer who wishes to produce learning which is wholly integrated in the psychological make up of the person would probably be advised to work on all three.

Transferability

Training implies the implanting of attitudes, knowledge and skills into the trainees for some good purpose or a combination of good purpose. Training programme designers have difficulty in defining and subsequently measuring outcomes? Whether the training has made the trainee a better person, helped him to appreciate, understand, or act more fully in some aspect of life.

2.13 Adoption of Innovation

In the past, it had been assumed that, all innovations are equivalent units of analysis. Rogers (1995) indicates that this assumption is a gross over-simplification but that there are certain characteristics of innovations that help explain their different rate of adoption. These are (i.) relative advantage, (ii) compatibility, (iii.) complexity, (iv.) trialability, and (v.) observability.

Relative advantage

This is the degree to which an innovation is perceived as better than the idea it supersedes. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is going to be.

Compatibility

This is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. An idea that is not compatible with the prevalent values and norms of a social system will not be adopted as rapidly as an innovation that is compatible.

Complexity

It is the degree to which an innovation is perceived as difficult to understand and use. New ideas that are simpler to understand will be adopted more rapidly than innovations that require the adopter to develop new skills and understanding.

Trialability

This is the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on the instalment plan will generally be adopted more quickly than innovations that are not divisible.

Observability

This the degree to which the results of an innovation are visible to others. The easier it is for individuals to see the results of an innovation, the more likely they are to adopt.

**2.14 Summary**

Continuous changes in farming technologies have necessitated the training of Front Line Staff of the Ministry of Food and Agriculture. This is to ensure that needs of farmers are met and by so doing improve the performance of the Front Line Staff. Evidence from the literature suggests that it is very difficult to measure performance, however certain characteristics could be used as proxy to measure it (Robbins, 1978). It is in this vein that the performance of the FLS is measured by the adoption behaviour of their farmers.

Industrial Psychologists have for years attempted to predict industrial characteristics (i.e. sex, age, educational status, marital status etc.) which best predict performance on the job. The correlation between individual characteristics and performance have at best been moderate (Schneider,1976). McGregor, (1967) indicated that performance has an ability and motivational components which must go together. Putting emphasis on one will affect performance in the negative direction. It is also found that no matter the type of motivation given to staff, they cannot meet the changes in their clients if they are not given adequate training. Bortei-Doku (1984) indicated in his work that training did a great deal in improving the morale of the field staff and put new life into the work of extension workers.

Anderson (1993) indicated that training is an incentive to employees and results in more efficient use of resources. Mtunzi (1990) also concluded from his work that training is both an incentive and motivation for better job performance.

The FLS are trained to perform some roles. Havelock and Havelock (1973) indicated that FLS have four main roles i.e. a catalyst, a solution giver, a process helper and a resource linker, to play as a change agent. And for them to perform these roles they are required to have some competencies. Maunder (1973) identified seven competencies. These are knowledge about the extension service organisation and operations, human development, programme development, the educational process, social system, communication and research and evaluation. These could be obtained through training at the pre-service, in-service, induction and graduate studies.

As the needs of farmers continue to change, there is the need for a correspondent training of the FLS especially during the in-service training sessions. In Ghana, the technical staff of the Ministry of Food and Agriculture are trained in the agricultural colleges namely Kwadaso, Nyankpala, Ohawu, Ejura, and Pong Tamale Agricultural Colleges. The professional staff are however trained in the country's three universities which are University of Ghana, University of Cape Coast and University of Development Studies.

Under the National Agricultural Extension Project (NAEP), the FLS are trained every month on the problems and needs of farmers in their operational areas by Subject Matter Specialist. Farmers could have needs for messages on tree crops, food crops, plant protection, cereals, vegetables, livestock and poultry, fisheries, home economics and non-traditional farming. They also have need as to the kind of extension methods and channels of communication to be used to present messages to them (Maunder, 1973).

Havelock and Havelock (1973) indicated that training experts find it difficult to agree on the extent to which training should go. The areas are the breadth of goals, relationship of training to the on-going life history of the trainee, psychological wholeness, and transferability.

Rogers(1995) also indicated that in general, innovations that are perceived by receivers as having greater relative advantage, compatibility, trialability, observability and less complexity will be adopted more rapidly than other innovations.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes the population for the study, how the sample was selected and the sample size used. It also identifies the methodological context of the main concepts of the study, the data collection process and how the data collected was analysed.

3.1 Population for the study

The population for the study comprised of all Front Line Staff of the Department of Agricultural Extension Services of the Ministry of Food and Agriculture and farmers who work with the Front Line Staff in the Suhum Kraboa-Coaltar and West Akim districts of the Eastern Region of Ghana. There were a total of twenty-five Front Line Staff and an estimated farmer population of about 296,073 for this study.

3.2 Sample selection and sample size

The entire population of extension workers, consisting of twenty-five (25) Front Line Staff made up of twenty (20) males and five (5) females was used. Five (5) of them had attended University and had obtained diplomas in different courses. The remaining twenty (20) have certificate in general agriculture from the various agricultural colleges in Ghana. The sample size for farmers was one hundred and twenty (120) made up of 95 males and 25 females. Because five of the Front Line Staff indicated they had just been posted to their operational areas and therefore did not know the farmers in their

operational areas, the farmers were selected by simple random sampling method from those who work with the remaining twenty Front Line Staff in twenty operational areas. Farmers who attended the meeting called by the FLS in the twenty operational areas were interviewed as groups thus giving twenty (20) farmer group interviews from the study area. Six (6) farmers were selected by simple random sampling method and interviewed in each operational area.

3.3 Data collection

Interview questionnaires were developed for both the FLS and farmers. Open-ended and close-ended questions were both employed in the development of the questionnaire. An interview checklist was also developed for the group of farmers in the communities. A summary of the nature of information or type of information required for addressing the research question, sources of information and data collection technique(s) used are contained in Table 3.1

TABLE 3.1: MAIN CONCEPTS, INFORMATION REQUIRED, SOURCES OF INFORMATION, AND DATA COLLECTION TECHNIQUES

MAIN CONCEPTS	INFORMATION REQUIRED	SOURCES OF INFORMATION	DATA COLLECTION TECHNIQUE
FARMERS TRAINING NEEDS	- Enterprises which farmers undertake - Extension methods preferred	- Farmers - Farmer groups	- Interview questionnaire - Checklist
CONTENT OF FLS TRAINING AT PRE-SERVICE, INDUCTION AND IN-SERVICE	- Enterprises and methods in which FLS received training in at different level of training	- Front Line Staff - Documents	- Interview questionnaire
CONTENT OF EXTENSION ACTIVITIES FARMERS HAVE PARTICIPATED AND METHODS USED	- Enterprises in which farmers received information and the medium used	- Farmers	- Interview questionnaire
PERFORMANCE OF EXTENSION WORKERS	- Pattern of adoption of innovations	- Farmers	- Survey Analysis of questionnaire

Based on the scheme in Table 3.1, the various data collection instruments were developed to facilitate the use of the different indicated techniques.

Interview checklist for community

An interview checklist was developed to obtain information on the farming activities of the farmers in the communities. It was also used to determine the extension method(s) and channels of communication(s) to be used by the FLS. See Appendix 1.

Questionnaire for farmers

This was divided into two parts. The first part sought information on the personal and socio-economic characteristics of the respondent farmers whilst the second part sought information on how they have adopted the various technological packages introduced to them to determine the performance of the Front Line Staff. See Appendix 2.

Questionnaire for the Front Line Staff

The first part of the questionnaire was designed to obtain information on the personal characteristics of the respondent Front Line Staff of the Ministry of Agriculture. The second part was designed to find the content of training provided to the Front Line Staff at the pre-service, induction and in-service periods. See Appendix 3.

Pre-testing

The questionnaires were pre-tested in the New Juaben district of the Eastern Region. The sample size, which consisted of ten (10) Front Line Staff made up of six (6) males and four (4) females were interviewed. Farmers of the FLS who were met in their homes or farms in the three operational areas namely Kojo Tenten, Akwadum and Wawase, were interviewed for the pre-testing. In all sixteen (16) farmers made up of fifteen (15) males and one (1) female were interviewed. The responses from the pre-testing were used to modify the data collection instruments.

Seminar

Before going to the field the researcher presented the study topic at a seminar. Present at the seminar were lecturers and students who criticised and made valuable suggestions. These suggestions were taken and used to modify the questionnaires finally.

3.4 Data collection process

Through the assistance of the District Agricultural Extension Officers, a meeting of all Front Line Staff was organised at the district capitals i.e. Suhum and Asamankese for Suhum Kraboa-Coaltar and West Akim respectively. The Front Line Staff were briefed on the objective of the research and the questionnaires explained to them to enable them give meaningful responses to the questions. The meeting also sought to inform the Front Line Staff about the visiting schedule to their operational areas. On the scheduled day of visit, farmers in each operational area who attended the meeting called by the Front Line Staff, were interviewed as groups to find their needs. Through the aid of the checklist, questions were posed to the farmers and after thorough discussions, the consensus views were recorded as the community's response.

After the group meeting, individual farmers were selected by simple random sampling method from the total number of farmers present by picking from a box containing pieces of papers. The selected farmers were interviewed individually and their responses recorded. The questionnaire for the FLS was given to the them to fill on the day of visit to their operational areas. Necessary clarifications were given to them on any part of the

questionnaire. Completed questionnaires were collected after they had been left with the Front Line Staff for about two (2) days.

3.5 Problems encountered on the field

The data collection period i. e. 28 April to 17th June 1997 coincided with the farming period of the study areas. Farmers left early in the morning for their farms and returned very late in the evening. In view of that, the researcher had to get up as early as possible to be able to get to the operational areas and meet them before they leave for their farms. The District Extension Officers forgot to inform the Front Line Staff who were not at the general meeting about the scheduled dates of visits to their operational areas. For that reason, there were a number of occasions community meetings and individual farmers interviews could not come on as originally scheduled because the Front Line Staff concerned were not aware and so did not inform the community. Such meetings had to be re-scheduled. It was also found that all the FLS worked mostly with male farmers.

3.6 Data analysis

The data for both the FLS and farmers were carefully examined to find out whether all the questions had been answered properly and how far they were accurate, consistent and appropriate. A summary of all the responses from the questionnaires were recorded and a coding scheme prepared out of it. The coding scheme was used to code the responses. The data collected from the Front Line Staff and individual farmers were analysed using the Statistical Package for the Social Sciences (SPSS Inc. 1989-1993). Frequencies and percentages were used to describe the data.

To find out whether different categories of respondents have markedly higher or lower percentage compared to the mean for the sample, the following was used: (1) if the total row percentage was between 0 and 33.3%, then the percentage for different respondents was considered markedly higher if any of the percentages in the other columns for that row is equal to or higher than twice the total or mean percentage. If any of the percentages in the other columns for that row is equal to or lower than half the total or mean percentage, this indicates a markedly lower percentage. (2) Similarly if the total row percentage is between 33.4 and 66.7% the factor is 1.5 and if the total row percentage is between 66.8 and 100%, the factor is 1.25. (Sakyi-Dawson, personal communication, 10th January, 1997). Chi-square was used to test for significant differences between variables at the 0.05, alpha level. Cell Chi-square values were then used to determined which cells contributed much of the significance (Levin and Fox, 1988). Tschuprow's T, estimated by the formular $T = \sqrt{\chi^2/N(df)}$ where N= sample size, and (df)=degrees of freedom was estimated to standardise χ^2 values to make them comparable where necessary.

With the checklist for the community interview, the responses were summarised to obtain the training needs of the farmers the Front Line Staff work with. Seasonal calendars of activities of farmers such as time of planting certain important crops in the study area were also drawn.



CHAPTER FOUR

THE STUDY AREA

4.0 Introduction

This chapter gives a brief summary of the study area. It shows the type of farming systems being practised, the crops and animals predominantly grown and reared as well as the land tenure situation obtained in the study area. It also shows the calendar of activities and gives an insight into the farming activities farmers needed technical messages as well as the extension methods and channels of communication they prefer to be used by the FLS.

4.1 Demography and Agro-climatology

Eastern Region is located in the southern portion of the Republic of Ghana. It lies between longitude 0°30" east and 1°30" west and latitude 5°30" north and 7°22 north.

The region is bounded in the north-east by Brong Ahafo, east by Volta Region, south east by Greater Accra Region, south-west by Central Region and west and north-west by Ashanti Region. There are 15 districts, which include Suhum Kraboa-Coaltar and West Akim districts (see Figure 4.1) where the actual data for the study was collected. The total land area of the region is 19,320sq.km which make up 8.1% of the total area of Ghana. The total population of the region by 1984 census was 1,696,483.

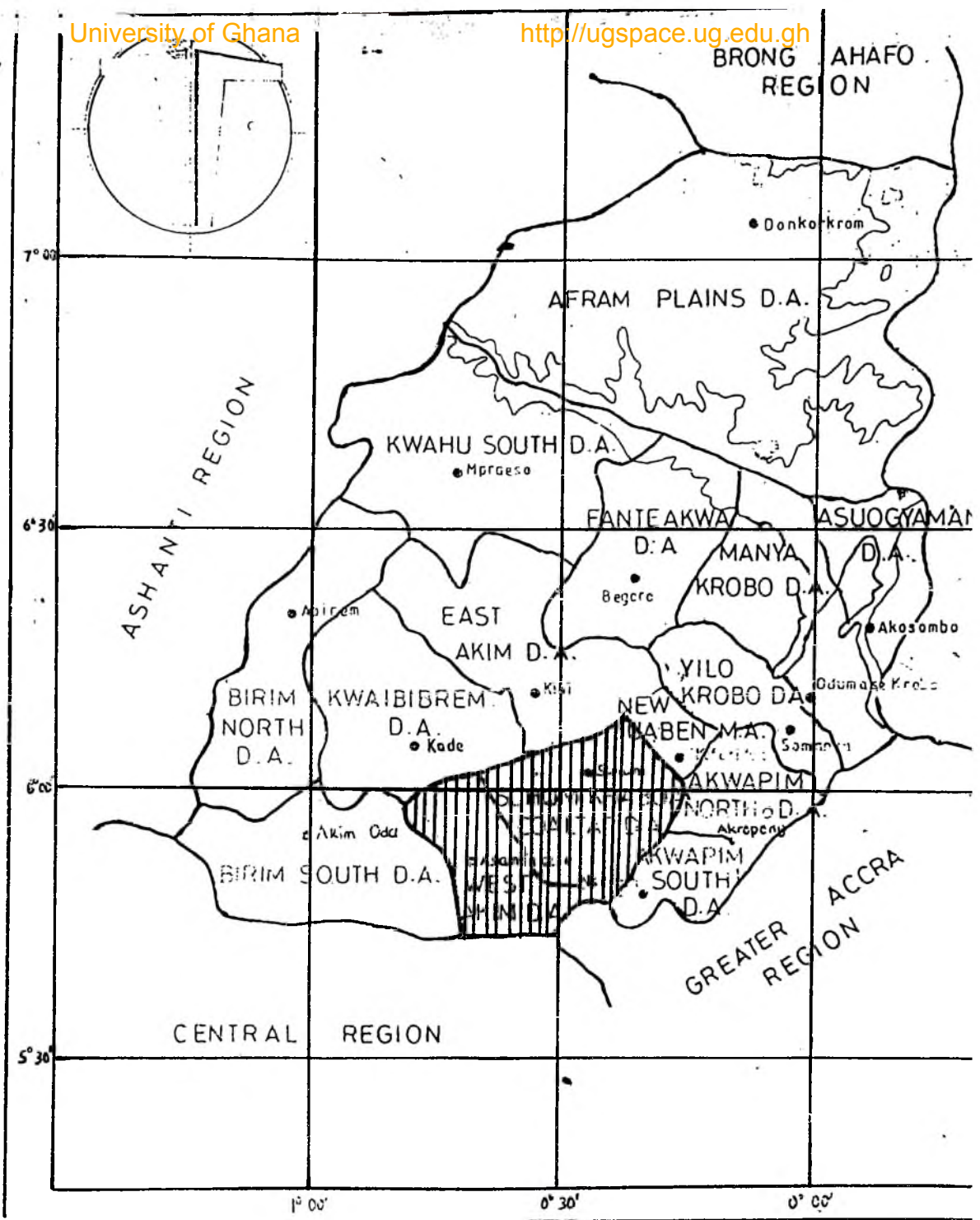


Figure 4.1 Map of Eastern Region showing the study area

The main soil type in all the districts except Kwahu North (Afram Plains) is Forest Ochrosol and Forest Lithosol. Savannah Ochrosol occurs mainly in Kwahu North and part of Yilo-Krobo, Manya and Asuogyaman districts with patches of Forest Rubrisols in the New Juaben and East Akim districts. The topography of the region is generally undulating with large stretch of flat land in the Afram Plains.

The region can be divided into three main vegetation zones as (a) Semi-deciduous rainforest covering the southern and central portions of the region (b) Savannah transitional zone covering the northern parts behind the Kwahu Scarp and (c) Coastal savannah covering the eastern fringes behind the Akwapim Range.

A number of forest reserves are located in the region.

DISTRICT	LOCATION OF FOREST RESERVE
Brim South	Pra Annan, Essen Epam, Esuboni and Oboyaw
Kwaebibirem	Esuensa, Aiyaola, Bediako, Jmamang ,Kajease
New Juaben	Atewa Range
Kwahu North	Worobong South
Kwahu South	Worobong South
Akwapim South	Spawsu
Manya Krobo	Yongwa
Asuogyaman	Yogaga and Aboben Hill

The rainfall distribution shows an extended bi-modal rainy season occurring in the forest zone while a uni-modal rainy season occurs in the savannah zone. Annual rainfall ranges

between 1500mm to 2000mm and 900mm to 13000mm in the forest and savannah zones respectively. Humidity is fairly moderate. Major rivers found in the region are Afram, Densu, Birim, Pra and Volta.

Suhum Kraboa-Coaltar and West Akim districts, have a land tenure system comprising of stool and family lands, lease hold, and share cropping (i.e. Abunu and Abusa). The predominant farming systems are land rotation, mixed cropping, crop rotation, inter-cropping and mixed farming (crops and animals). Cropping farming pattern are mainly shifting cultivation, one year cropping, two to three year fallow and crop rotation. The major crops grown in the two districts are maize, plantain, cassava, vegetables(garden eggs, tomatoes, pepper, okro), oil palm, cocoyam and citrus whilst the major animals reared are poultry, sheep and goats.

4.2 Calendar of farming activities

This shows the definite dates when certain operations are to be carried out. A knowledge of it will help in the identification of specific needs of farmers and thus lead to appropriate training of the FLS

4.2.1 Types of crops grown and animals reared

The farming system of the study area had significant effect on the types of crops grown by farmers. Different combinations of crops are grown on farmers' farms. The crops grown include maize, cassava, vegetable, plantain, oil palm, citrus, cocoyam, yam, pineapple, sugarcane, rice, teak, in that order of importance. It was however found that in



all the communities, maize, cassava vegetables and plantain formed part of almost all combination of crops they grow on their farms, indicating these are the important crops. This is confirmed by Figure 4.2.

Figure 4.2 Time of planting of some major crops in the study area

Cow-pea												
Citrus												
Oil palm												
Yam												
Plantain												
Vegetable												
Cassava												
Maize												
	Jan	Feb	Mar	Apr	May	Jun	Jly	Aug	Sep	Oct	Nov	Dec

Source: Field survey, 1997

The animals reared included fowls, sheep, goats, pigs, ducks, rabbits, turkeys and cattle in that order of importance. It was found that every farmers had at least fowls, sheep and goats in the house.

The responses of farmers in the study area showed that they are involved in a number of field activities. These included (i) land clearing (ii) land preparation (iii) weeding (iv) burning (v) preparation of yam mounds (vi) staking of yam (vii) fertilizer application as can be seen in Fig.4.3

Figure 4.3 Field activities carried out in the study area

Fert. appl												
Yam staking												
Mound prep												
Weed-ing												
Burn-ing												
Land prep.												
Land clearing												
	Jan	Feb	Mar	Apr	May	Jun	Jly	Aug	Sep	Oct	Nov	Dec

Source: Field survey 1997

(i) Land clearing - This activity was predominantly carried out during the months of January to April and July to October.

(ii) Land preparation - It also followed the same pattern as land clearing. Serious land preparation begins from January to April and from July to October. These two activities are carried out in anticipation of rainfall in the study area. There are two rainy season

which occurred from March to June and September to November for the major and minor seasons respectively.

(iii) Weeding - Weeding under farms are carried out from January to June and July to November.

(iv) Burning of farms: - This field activity begins from January through to April during the major season. It is also done in July till October or November.

(v) Yam mound preparation - Mound preparation was carried out during the months of February, March and April. Planting of yam sets/heads began with the onset of the rain around March. The yams were staked from March to April.

(VI) Fertilizer application: - It was found out that fertilizer application was carried out almost throughout the year. This was because farmers used fertilizer on maize as well as vegetables which are cultivated between the two rainy seasons

Maize and cassava are grown mainly from January to May and August to October.

Vegetables are cultivated throughout the year. The decline from July to August was due to the break for clearing land. Plantain and yam are mostly cropped around March through July. Oil Palm and citrus were also cropped from May to July whilst cowpea was also cropped between June and July.

Farmers do not follow any pattern of activity in the area of animal production. They obtain animals as and when it is necessary for them. They do not follow any routine treatment schedule for the animals. They call on the veterinary officer when the need arises.

4.3 Farming enterprises farmers indicated they needed technical messages

Farmers in the communities agreed that for them to be able to increase their production to improve on their standard of living, they needed technical messages on the cultivation of maize, cassava, vegetables, plantain, oil palm, citrus, cocoyam, yam, pineapple, sugarcane, rice, black pepper, teak, cowpea, groundnut and mango. Animals farmers needed technical messages on poultry, sheep, goats, pigs, ducks, rabbits, turkey, cattle and fish farming.

There is no doubt that farmers have other needs in agriculture which are yet to be addressed by the extension officers. Farmers expressed deep interest in having technical knowledge on snail production, mushroom cultivation and bee-keeping. Next on the list of farmers needs are knowledge on the cultivation of citrus and oil palm. They needed more knowledge on how to nurse, transplant, protect against diseases and pest, storage and process fruits. Again farmers expressed the desire to have adequate knowledge on the production of pawpaw, cocoyam, pineapple, cashew and vegetables. Other areas like yam minisett technology, split corm techniques of plantain, storage of maize, detection of diseases of plants, and how to use chemicals e.g. how to apply weedicides on their farms, were of concern to farmers. The knowledge on agro-forestry practices was not left out by farmers. In the area of animal production, farmers expressed the desire to have knowledge on rabbit rearing, fish farming and detection and treatment of diseases of sheep, goats and cattle.

4.4 Extension methods and channels of communication preferred by farmers

All farmers in the communities indicated their preference for group approach to be used by the Front Line Staff to reach them with technical messages. They believe that through the group approach, messages could be spread quickly to other farmers whilst at the same time they could share common problems and find solutions to them. Apart from the group approach, farmers agreed that the Front Line Staff should follow up on the individual farmers both at the home and on the farm to find out whether whatever practice(s) he had taught them was being practised correctly by farmers. Mass method was not popular with farmers. This is so because most farmers do not have time to listen to the radio or do not even have access.

When asked which channels of communication they would prefer to be used by the Front Line Staff, most farmers gladly opted for “spoken” as their first preference. The reasons being that it offered them the opportunity to interact with the Front Line Staff, express their views and ask questions to clarify any misunderstanding about any message given. “Spoken and visual” was the next channel of communication preferred by farmers. They are of the view that learning would be enhanced if pictures or samples are shown to them. Most farmers are not in favour of the use of “written” as a channel of communication. They see it as that for the literate, who even find it difficult sometimes to interpret and use information presented through that means. They, farmers, being mostly illiterate or having lower education would find it very difficult to understand giving through such means.

Farmers in all the twenty communities showed their preference for demonstration to be used by the Front Line Staff to clarify technical messages. Their reasons were that through demonstration, they would be able to practice whatever messages/innovations brought by the Front Line Staff. For example, through demonstration, they could practice and understand how area fertilizer is applied to crops.

4.5 Forum to discuss farmers' needs

When the question was put to farmers as to whether they have had opportunity to discuss their needs with extension officers, most of them in all the communities visited said that no such forum have been held before. Other responses like “have had such meeting before”, “have had such forum on about three occasions”, “held one about six years ago”, confirmed what the majority have said. This indicates that the FLS hardly organises fora at which farmers' needs are discussed.

4.6 Summary

The study area, Suhum Kraboa/Coaltar and West Akim districts, is part of the Eastern region of Ghana. It has a bi-modal rainy season with a land tenure system comprising of stool lands, lease hold, and share cropping. The predominant crops grown are maize, cassava, plantain, vegetables(garden eggs, tomatoes, pepper, okro), cocoyam, oil palm, and citrus whilst poultry, sheep and goats are the major animals reared.

The response of farmers from the interview indicated that the needs of farmers consisted of their having technical knowledge in crop production-i.e the cultivation of maize,

cassava, plantain, vegetables, oil palm, citrus, cocoyam, pineapple, sugarcane, rice, black pepper, groundnut, mango, the cultivation of teak, detection of diseases of plants, and how to use chemical like weedicides. In animal production and other farming enterprises, the needs identified included the production, detection and treatment of diseases in poultry, sheep, goats, pigs, cattle, rabbits, ducks, snail farming, fish farming, mushroom production and bee-keeping.

The farmers expressed the need for the Front Line Staff to reach them with messages mainly through group methods by using mostly spoken and visual channels of communication.

CHAPTER FIVE

NATURE AND CONTENTS OF TRAINING AND SPAN OF KNOWLEDGE OF FRONT LINE STAFF(FLS)

5.0 Introduction

From the previous chapter, the needs of farmers in the study areas were identified. It is hypothesized that where these needs are addressed by training, the training or messages that extension workers give their farmers are likely to better address the farmers' needs. This chapter thus focuses on the nature and content of the training provided to the Front Line Staff during their in-service, pre-service and induction training activities and the level (span) of knowledge of the FLS. In addition, it examines some personal characteristics of the Front Line Staff and relationship between some personal characteristics and their level of knowledge .

5.1 Personal characteristics of Front Line Staff

A knowledge of the personal characteristics of the FLS gives an idea about the kind of people they are. The characteristics considered are age, gender, marital status, agricultural college attended, year of completion of agricultural college, and number of years in operational area.



5.1.1 Age

Table 5.1 shows that majority (80.0%) of the Front Line Staff interviewed are relatively young (20-39 years) while the remaining five (20.0%) are relatively older (40-59 years). This result shows that 80% of the Front Line Staff are going to work for a long period with the Ministry of Food and Agriculture. They will have a great deal of experience and knowledge about agricultural technologies and innovations as a result of the numerous in-service training they will go through.

Table 5.1 Age distribution of Front Line Staff

Age of Front Line Staff	Frequency	Percent
Relatively Young (20-39) years	20	80.0
Relatively Old (40-59) years	5	20.0
Total	25	100.0

Source: Field survey 1997

5.1.2 Gender

Table 5.2 shows that out of the twenty five Front Line Staff interviewed, twenty (80.0%) are males and the remaining (20.0%) are females. The more male FLS found could be attributed to the nature of the work which involves a lot of trekking since women normally will like to work at places where they will be indoors.

Table 5.2 Gender distribution of Front Line Staff

Gender	Frequency	Percent
Male	20	80.0
Female	5	20.0
Total	25	100.0

Source: Field survey 1997

5.1.3 Marital status

Regarding marital status, 76.0% of the respondents indicated they are married. Six (24.0%) are either single, widowed or divorced as shown in Table 5.3. Because a greater percentage of the Front Line Staff are married, farmers who work with them will see them as being responsible people in the society. This will make the farmers respect and listen to the advice the FLS will give them. This could likely lead to higher adoption of technologies by farmers.

Table 5.3 Marital status of Front Line Staff

Marital Status	Frequency	Percent
Married	19	76.0
Single/Widowed/Divorced	6	24.0
Total	25	100.0

Source: Field survey 1997

5.1.4 Agricultural college attended

Table 5.4 shows that 56.0% of the Front Line Staff attended Kwadaso Agricultural College, 16.0% attended Ejura Agricultural College, 20.0% attended Ohawu while the remaining (8.0%) had their pre-service education at Nyankpala Agricultural College. Figure 5.1 shows the locations of the colleges on the map of Ghana. The result indicates that more of the FLS had their training at Kwadaso Agricultural College. The reasons that could be assigned is the fact that the school is the oldest and the only agricultural college in the country for some time before the establishment of the others.

Table 5.4 Agricultural colleges attended by Front Line Staff.

Agricultural College attended	Frequency	Percent
Kwadaso	14	56.0
Ejura	4	16.0
Ohawu	5	20.0
Nyankpala	2	8.0
Total	25	100.0

Source: Field survey 1997

5.1.5 Year of completion of agricultural college

With regard to the year of completion of their pre-service training at the agricultural colleges, majority (72.0%) of them were found in the 1981-1991 year group when an initial ten year groups were used. A regrouping was done to find those Front Line Staff trained before the establishment of the Department of Agricultural Extension Services (i.e. Up to 1987) and those trained after the establishment of the department (1988-1997). Table 5.5 shows that fourteen (56.0%) of the Front Line Staff had their pre-service training before the establishment of the department while eleven (44.0%) were trained after its establishment. This indicates that more than half of the FLS have worked for over ten years with the Ministry of Agriculture and as such have a lot of experience in the work. The result suggests that since a greater percentage of the FLS received their pre-service training some ten years ago, it is important that they are given in-service training on new agricultural technologies and innovations.

Table 5.5 Year of completion of agricultural college by Front Line Staff

Year of Completion	Frequency	Percent
Up to 1987	14	56.0
1988 - 1997	11	44.0
Total	25	100.0

Source: Field survey 1997

5.1.6 Number of years in operational area

Table 5.6 shows that 28.0% of the Front Line Staff have worked in their operational area between 1-3 years. The majority (72.0%) have however worked for more than four years in their operational area which gives an indication that most of the Front Line Staff are likely to know the environment and the farmers they are working with well. The continuous interaction of farmers will enable the FLS have a fair view of the problems of their farmers as well as the resources available. This will help them to make recommendations based on farmers' circumstances.

Table 5.6 Number of years in operational area

Year in operational area	Frequency	Percent
1-3 years	7	28.0
4 years +	18	72.0
Total	25	100.0

Source: Field survey 1997

5.1.7 Number of years with extension department

Table 5.7 shows that 16.0% of the Front Line Staff have worked with the Extension Department for between 1-4 years, while 84.0% have also worked for 5 or more years. The result indicates that the FLS have gone through a lot of in-service training sessions that have equipped them to be able to handle farmers' problems on the field.

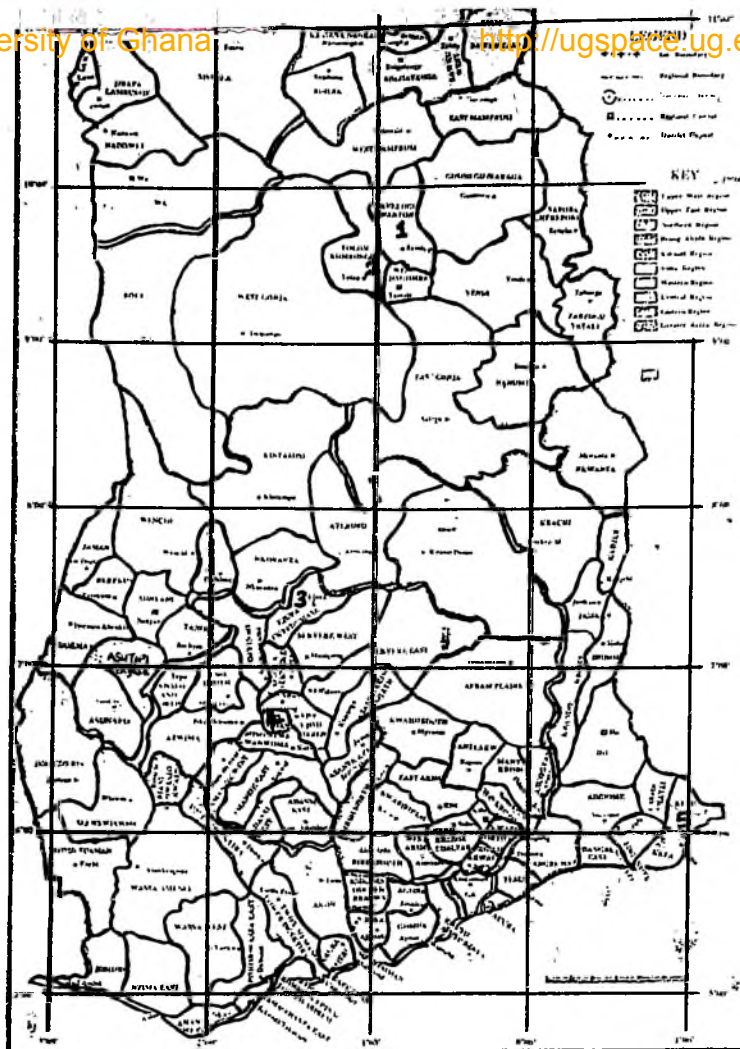


Figure 5.1 Map of Ghana showing the locations of the Agricultural Colleges

Key

No	School	District
1	Pong Tamale	Savelugu Nanton
2	Nyankpala	Tolon Kumbungu
3	Ejura	Ejura Sekyedumase
4	Kwadaso	Kumasi Metropolitan Authority
5	Ohawu	Ketu

Table 5.7 Number. of years with the Extension Department

No. Of years with Extension Department	Frequency	Percent
1 - 4years	4	16.0
5 - 9 years	10	40.0
10 years +	11	44.0
Total	25	100.0

Source: Field survey 1997

5.1.8 Numbers of years as Front Line Staff

As to the number of years as a Front Line Staff, 28.0% indicated that they have been Front Line Staff between 1-4 years, 36.0% each also showed that they have been Front Line Staff between 5-9 years and 10 years or more respectively as shown in Table 5.8. Together, with the high proportion of the FLS who have worked in the Department of Agricultural Extension Services for five years or more, 72% of the FLS have worked in that capacity for five or more years suggest that most of them are experienced enough to be able to work effectively.

Table 5.8 Number of years as Front Line Staff

Years as Front Line Staff	Frequency	Percent
1 - 4years	7	28.0
5 - 9 years	9	36.0
10 years +	9	36.0
Total	25	100.0

Source: Field survey 1997

5.2 Subject Areas in which FLS have been trained

The subject areas considered include crop production, livestock production, extension methods and other subject areas.

5.2.1 Crop production

Table 5.9 shows that all the twenty-five Front Line Staff have received training on Crop production. Twelve percent (12.0%) of them indicated their source of training to be at only the pre-service i.e. agricultural colleges, while 88.0% have had training at both pre-service and in-service periods. There is however nobody who had his source of training only during in-service periods.



5.2.2 Livestock production

Table 5.9 shows that all the Front Line Staff indicated again that they have received training on livestock production. Majority (84.0%) of them indicated they received their training at both the pre-service and in-service periods, while 16.0% showed their source of training to be from only the pre-service period. There is however no one who received training on livestock production only during the in-service periods.

5.2.3 Extension methods

Table 5.9 shows that 96.0% of the Front Line Staff have training in extension methods and only one (4.0%) indicated he has not received any training whatsoever. Sixteen percent (16.0%) indicated the source of their training from only the agricultural colleges, 8.0% from in-service training only and the majority (72.0%) of the Front Line Staff indicated both pre-service and in-service periods as their sources of training in extension methods.

Table 5.9 Nature and source(s) of training Front Line Staff have received. N =25*

TRAINING AREAS	No Training Received	Pre-Service	In-Service	Pre-Service and In-Service
Crop Production	0.0	12.0	0.0	88.0
Livestock Production	0.0	16.0	0.0	84.0
Extension Teaching Methods	4.0	16.0	8.0	72.0
Fish Farming	8.0	0.0	88.0	4.0
Agroforestry	16.0	4.0	72.0	8.0
WIAD Activities	8.0	4.0	76.0	12.
Post Harvest Technology	0.0	4.0	68.0	28.0
Mushroom Production	76.0	4.0	20.0	0.0
Snail Production	60.0	0.0	40.0	0.0
Beekeeping	80.0	8.0	12.0	0.0
Adoption Process	64.0	12.0	20.0	4.0
Barriers to Communication	60.0	28.0	8.0	4.0
Non- Verbal Communication	76.0	4.0	8.0	12.0
Characteristics of Innovation	80.0	4.0	8.0	8.0
Channels of Communication	60.0	12.0	20.0	8.0
Communication Principles	32.0	8.0	24.0	36.0
Teaching Aids	28.0	32.0	16.0	24.0
Programme Planning	32.0	4.0	48.0	16.0

Source: Field survey-1997

* N≠100 percent due to multiple responses

5.2.4 Other subject areas

Table 5.9 shows that majority of the Front Line Staff received training in the following areas, fish farming (88.0%), Agroforestry (72.0%), WIAD activities (76.0%) and Post Harvest Technology (68.0%), only during the in-service periods. A greater percentage of the Front Line Staff have not received any training in the following areas; mushroom production (76.0%), Snail production (60.0%). Beekeeping (80.0%), Adoption Process (64.0%), Barriers to Communication (60.0%), Non-verbal communication (76.0%),

Characteristics of Innovation (80.0%), and Channels of Communication (60.0%). With regard to training in areas like Communication Principles, Teaching Aids, and Programme Planning, at least seven people each (28.0%) indicated they have not received any training.

5.3 FLS attendance of In-service Training

This shows the number of FLS who attended in-service training, reasons why some did not attend, in-service training topics treated and adequacy of in-service training

5.3.1 FLS who attended in-service training and reasons why some did not attend

Table 5.10 shows that twenty-three (92%) of the Front Line Staff indicated they have attended in-service training during the last two years i.e. 1995 and 1996. Only two FLS did not attend since they were by then at school. The high percentage of FLS who attended in-service training suggests that they are receiving the necessary training that will equip them to meet the needs of farmers. This is so since it is at the in-service training sessions that farmers' problems are discussed and solutions given.

Table 5.10 FLS reasons for attending and not attending In-Service training under NAEP

Item	Frequency	Percent
<u>FLS who attend In-Service Training</u>		
Yes	23	92.0
No	2	8.0
Total	25	100.0
<u>Reasons for not attending</u>		
Was at School	2	100.0

Source: Field survey-1997

5.3.2 In-service training topics

Concerning the topics treated during monthly training sessions in 1995, each Front Line Staff mentioned combination of topics but for the purpose of this work each topic was therefore treated singly to determine the number of Front Line Staff who mentioned it in all their combinations. Table 5.11 shows that 91.3 % of the Front Line Staff mentioned Agro-forestry which is followed by Weaning and Weaning food (87.0%) and Safe use and handling of Agro-chemicals (87.0%). Topics like Post harvest handling of Fish (82.6%), Farm record keeping (78.3%), Plantain Production (73.9%) and Sugarcane Production (69.6%) follow in that order.

Table 5.11 In-service training topics mentioned by FLS for 1995 N = 23*

Training Topics Treated	Frequency	Percent
Agro-forestry	21	91.3
Weaning and Weaning food	20	87.3
Safe use and handling of agro-chemicals	20	87.0
Post harvest handling of fish	19	82.6
Farm Record Keeping	18	78.3
Plantain Production	17	73.9
Sugarcane Production	16	69.6
Post Harvest Management of Grain	15	65.2
How to raise healthy birds	10	43.5
Larger Grain Borer	7	30.4
The Narrow Crib	6	26.1
Data Collection and Information flow	6	26.1
Determination of Yield	2	8.7
Review of Post harvest Management	2	8.7
Programme Planning	1	4.3
Rural Water Sanitation	1	4.3
Dry and Wet Season of Farm animals	1	4.3
Integrated Pest Management	1	4.3
Evaluation and Assessment	1	4.3

Source: Field survey-1997

* N ≠ 100 percent due to multiple responses

Table 5.12 shows distribution of topics indicated to have been treated in 1996. It shows that 95.6% of the Front Line Staff mentioned Micro-nutrient deficiency in all their combination. It is followed by Breeding management in small ruminants (91.3%), Nursery techniques in tree crops (91.3%) and Integrated Pest Management (86.9%). How to calibrate sprayers (82.6%), Housing of ruminants (78.3%) and Tilapia Culture (73.9%) follows in that order. Other topics also follow as shown in Table 5.12

Table 5.12 In-service training topics mentioned by FLS for 1996 N = 23*

Training Topics	Frequency	Percent
Micro-nutrient deficiency	22	95.6
Breeding Management in Small Ruminants	21	91.3
Nursery Techniques in Tree crops	21	91.9
Integrated pest Management	20	86.9
How to calibrate Sprayers	19	82.9
Housing of Ruminants	18	78.3
Tilapia Culture	17	73.9
Participatory Rural Approach	4	17.4
Management and Vegetative propagation of plantation crops	4	17.4
Extension Methodology	2	8.7
Cocoyam Preservation	2	8.7
Field Problems	1	4.3
Farm Budgeting	1	4.3
Waste Management	1	4.3
Pest and disease control of rural poultry	1	4.3
Safe use of agro-chemicals	1	4.3
Programme Planning	1	4.3

Source: Field survey-1997 * N≠100 percent due to multiple responses

5.3.3 Adequacy of in-service training

Table 5.13. indicates that 40% of FLS think the training is adequate because it equips them to impart appropriate technologies to farmers. For other reasons, 20% also indicated the training is adequate because the subjects treated were relevant to solve problems associated with crops and livestock for maximum yield while another 20% said it was adequate because it was conducted monthly. The remaining 20% of the FLS think the teachers taught as if they were on the field.

Table 5.13 FLS reasons why in-service training is adequate

Adequacy of training	Frequency	Percent
FLS who say training is not adequate	15	60.0
FLS who say training is adequate	10	40.0
Reasons why training is adequate	Frequency	Percent
It equips FLS to impart appropriate technologies to farmers	4	40.0
Subject treated are relevant to solve problems Associated with crops and livestock	2	20.0
Teachers teach as if on the field	2	20.0
Because it is done monthly	2	20.0
Total	10	100.0

Source:Field survey-1997

Various reasons were given in Table 5.14 for the inadequacy of the in-service. Forty percent indicated that the in-service training given is inadequate because the time frame in which it is conducted does not give room for a comprehensive treatment of topics and conduct of practical. The concern of another 26.7% is on the lack of practical training on topics treated.

Table 5.14 FLS reasons why in-service training is inadequate

Reasons	Frequency	Percent
All areas of crops and livestock not covered	2	13.3
Content do not cover practical lessons	4	26.7
Time limit/No practicals	6	40.0
No covered some subjects of importance	2	13.3
Time limit/irrelevant topics	1	6.7
Total	15	100.0

Source:Field survey-1997

5.4 Induction training

The areas covered include the number of FLS who received the training, its contents and importance to the FLS

5.4.1 Number of FLS who had induction training

Table 5.15 shows that 76.0% of the respondents indicated they were not given induction training when first employed. Twenty-four percent however said they were given induction training when first employed, thus indicating that induction training has not been practised much by the DAES in Ghana.

Table 5.15 Front Line Staff given induction training

FLS given Induction Training	Frequency	Percent
Yes	6	24.0
No	19	76.0
Total	25	100.0

Source: Field survey-1997

5.4.2 Contents of induction training

Table 5.16 shows that 4.0% each of the Front Line Staff indicated they had training in (i) duties of the Front Line Staff, Training and Visit of the FLS and Extension methodology, (ii) Management of resources in the farm and home (iii) how to go about extension work (iv) Practical training at livestock and poultry farms in the Eastern Region and (vi) how to extend agricultural technology to women farmers.

Table 5.16 Contents of induction training

Content of Induction Training	Frequency	Percent
No. Training	19	76.0
Duties of FLS, T&V of FLS, Extension Methodology	1	4.0
Management of resources in the farm and home	1	4.0
Practical Training at Livestock & Poultry farms in Eastern. Region	1	4.0
How to go about extension work	1	4.0
How to extend agriculture technology to women farmers	1	4.0
History of Extension	1	4.0
Total	25	100.0

Source: Field Survey-1997

5.4.3 Importance of induction training

Table 5.17 shows that twenty-one (84.0%) of the respondents answered in the affirmative, while four (16.0%) also indicated they could not tell.

Table 5.17 FLS view on the importance of induction training

Is Induction Training Important	Frequency	Percent
Cannot Tell	4	16.0
Yes	21	84.0
Total	25	100.0

Source: Field survey-1997

Sixty percent of the Front Line Staff indicated that induction training gives insight into the work the Front Line Staff is going to do in the field while 8.0% also said induction training helps them to efficiently address problems on the field. Other reasons given are shown in Table 5.18. There was however one (4.0%) respondent who said he could not comment since he has not attended one before. Thus, although most of the FLS have not had induction training, most of them see it as important because of the insight it is likely to give on their job.

Table 5.18 FLS reasons why induction training is important

Reasons	Frequency	Percent
No reasons given	3	12.0
Cannot comment on as I have not attended one before	1	4.0
Gives insight into work you are going to do	15	60.0
Helps FLS to efficiently address problems on the field	2	8.0
Gives insight of the regulation of the department	1	4.0
Refreshes the mind of the newly employed FLS	1	4.0
Gives insight into work, strengthens and encourages FLS	1	4.0
New improved technologies are taught	1	4.0
Total	25	100.0

Source: Field survey-1997



5.5 Higher In-service Education

Table 5.19 shows that a greater percentage (80.0%) of the Front Line Staff have not attended any higher institution. Only five of them (20.0%) have attended the University. This result indicates that the FLS have not upgraded their knowledge on other competencies which were not available to them during their pre-service training.

Table 5.19 Front Line Staff who have attended higher institution

FLS attending higher institution	Frequency	Percent
None	20	80.0
University/Polytechnic	5	20.0
Total	25	100.0

Source: Field survey-1997

Table 5.20 shows the type of courses pursued by the Front Line Staff at the University. Eight percent (8.0%) pursued a Diploma in General Agriculture course, 4.0% each undertook Diploma courses in Post Harvest, Farm Management and Extension and Higher National Diploma in Agriculture respectively. Eighty percent of the Front Line Staff have not attended any higher institution.

Table 5.20 Courses taken at higher institution

Course Taken	Frequency	Percent
FLS who have not attended higher institution	20	80.0
Dip. Post Harvest	1	4.0
Dip. Farm Management	1	4.0
Higher National Diploma (Agriculture.)	1	4.0
Dip. General Agriculture	2	8.0
Total	25	100.0

Source: Field survey-1997

Table 5.21 shows that the course content for two Front Line Staff was almost the same. Apart from surveying which was not studied by one of the FLS, the two had training in Crops Science, Animal Science, Agricultural Extension, Agriculture Economics, Soil Science and Agriculture Mechanisation at the University. Other Front Line Staff studied a combination of Crop Science/Agricultural Extension/Agriculture Economics (4.0%),

Agriculture Extension (4.0%) and Preservation of durable (4.0%) at the University. It was however found that almost all the Front Line Staff studied Agricultural Extension. This suggest that the courses studied at the higher institutions included Crops, Animal Science, Agricultural Economics and Agricultural Extension.

Table 5.21 Content of courses taken at higher institution

Content of Course	Frequency	Percent
FLS who have not attended higher institution	20	80.0
Crops/Animals/Extension/Agric. Econs/Soil/Mech.	1	4.0
Crops/Animals/Extension/Agric. Econs/Soil/Mech/Survey	1	4.0
Crops/Extension/Agric. Econs.	1	4.0
Agric. Extension	1	4.0
Preservation of durables	1	4.0
Total	25	100.0

Source: Field survey-1997

5.6 Perceptions of FLS on extent of training received in the various agricultural areas

Table 5.22 shows that 84% of the Front Line Staff indicated they have received high training in crop production while the remaining 16% also said they have average training. Even though all the Front Line Staff indicated they have training in livestock production, majority (52%) have average training with only 16% indicating they have received high training. Thirty-two percent also show they have received little training in livestock production. It could be seen that in areas like fish farming, mushroom production, beekeeping and snail production, more than 50% of the Front Line Staff have not received any training but more than 50% have received little training in agro-forestry

(56%) and WIAD activities (52%). However in respect of post harvest technology, 76% of the Front Line Staff have average to high training as shown in Table 5.22.

Combining the high and average extent of training in the various agricultural areas gives the following ranking in descending order-Crop production, Post harvest technology livestock production and WIAD activities. Areas where the Front Line Staff have received least training are Bee-keeping, Snail production, Mushroom production, Fish farming, and Agro-forestry.

Table 5.22 FLS perceptions on the extent of training received in the various agricultural areas.

Perceptions of training received in the various agricultural areas	None	Little	Average	High	Ranking
Crop Production	0.0	0.0	16.0	84.0	1
Post Harvest Technology	0.0	24.0	60.0	16.0	2
Livestock Production	0.0	32.0	52.0	16.0	3
WIAD Activities	0.0	52.0	32.0	8.0	4
Agro Forestry	24.0	56.0	16.0	0.0	5
Fish Farming	72.0	20.0	8.0	0.0	6
Mushroom Production	92.0	4.0	4.0	0.0	7
Snail Production	56.0	44.0	0.0	0.0	8
Bee keeping	76.0	24.0	0.0	0.0	9

Source: Field survey-1997

5.7 Classification of FLS into having wide or narrow span of knowledge

An eighteen - tier training areas (Table 5.9) was initially used to classify Front Line Staff into those with wide and narrow span of knowledge depending on the number of areas they have received training in. It turned out that almost each Front Line Staff stood alone

rendering the classification ineffective. To overcome this, the areas where the Front Line Staff have received training were categorised into four, namely crop production, livestock production, Extension Methods and “Others”. The “Others” comprise of knowledge in Fish farming, Agroforestry, WIAD activities, Post harvest technology, Mushroom Production, Snail Production, Beekeeping, Adoption Process, Barriers to Communication, Non verbal Communication, Characteristics of Innovation, Channels of Communication, Communication Principles, Teaching Aids and Programme Planning.

Based on the assumption that the number of areas FLS have received training in is likely to be an indicator of the span of knowledge they have, all the Front Line Staff have knowledge in Crop Production, Livestock Production and Extension Methods. Therefore, for a Front Line Staff to be classified as having wide span of knowledge, they should have knowledge in more than five areas of “Others” in addition to crop production, livestock and extension teaching methods. Five was used because it is a third of the components of the training areas. On the other hand a Front Line Staff is classified as having narrow span of knowledge if he has less than five of “Others” in addition to crop production, livestock and extension methods.

Using the four-tier training areas, Figure 5.2 shows that eighteen (72%) Front Line Staff are classified as having wide span of knowledge while seven (28%) of them have narrow span of knowledge. This is further represented in Table 5.23.

Table 5.23 Classification of FLS into wide and narrow span of knowledge

Classification	Frequency	Percent
Wide span of knowledge	18	72.0
Narrow span of knowledge	7	28.0
Total	25	100.0

Source: Field survey-1997

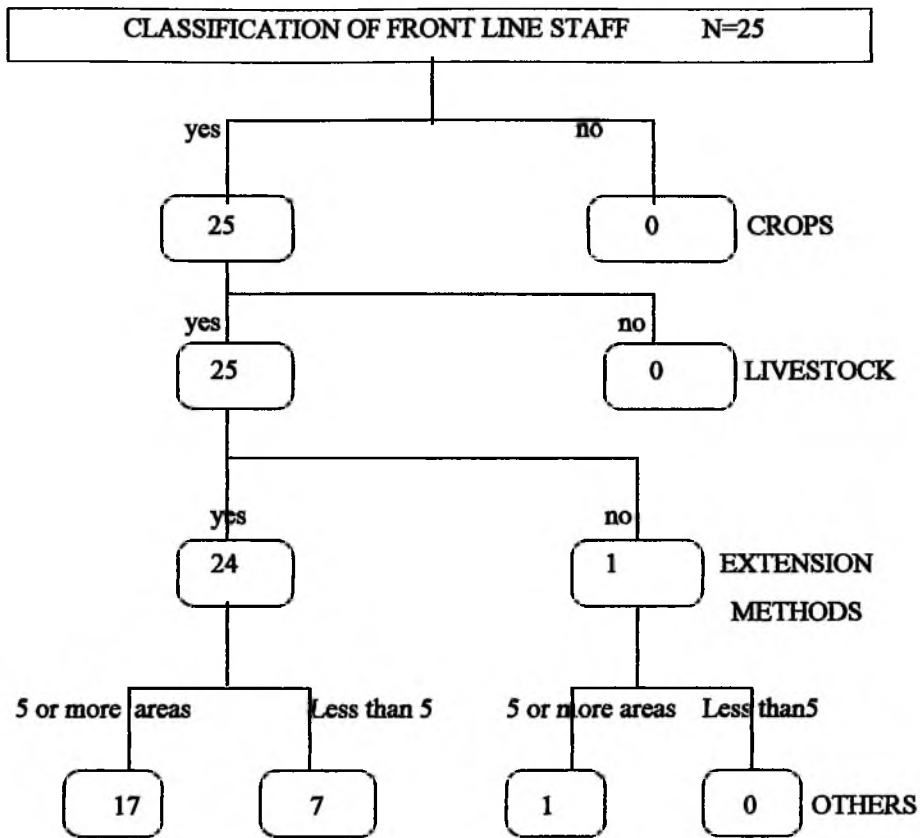


FIG.5.2 AGRICULTURAL SUBJECT AREAS FRONT LINE STAFF HAVE RECEIVED TRAINING

5.8 Relationship between types of training and level of knowledge FLS indicated have received

Table 5.24 shows that there is no statistically significant relationship ($\chi^2=2.76$, $df=2$, $\rho=0.25$) between types of training received by Front Line Staff and the level of knowledge they have received. The result shows no difference in FLS who have training at only Agricultural College; both Agricultural College and monthly in-service training; and Agricultural College, monthly in-service training and University. The expectation is that the level of knowledge of the FLS will increase with increase in the types of training. The reasons that could be assigned for this result is that there is no difference in the content of training given to the FLS at these levels which is mostly on crop production, livestock production and agricultural extension leaving other areas.

Table 5.24 Types of training and level of knowledge FLS have received

Level of knowledge of FLS	Types of training						Total	
	One		Two		Three		n	%
	n	%	n	%	n	%		
Wide span	0	0.0	14	73.7	4	80.0	18	72.0
Narrow span	1	100.0	5	26.3	1	20.0	7	28.0
Total	1	100.0	19	100.0	5	100.0	25	100.0

$\chi^2 = 2.76$, $df = 2$, $0.2 < p < 0.3$ (NS)

5.8.1 Relationship between attendance of higher institution and span of knowledge of Front Line Staff

Table 5.25 shows that markedly higher percentage of those who attended higher institutions had narrow span of knowledge, whilst markedly lower percentage of the same had wider span of knowledge, however the relationship is only marginally

statistically significant ($\chi^2=3.17$, $df=1$, $p=0.07$). This seem to suggest that higher education did not necessary lead to wider span of knowledge.

Table 5.25 Attendance of higher institution and level of knowledge Front Line Staff have received

Level of knowledge of FLS	Attendance of higher institution				Total	
	Not attended		University/Poly		n	%
	n	%	n	%		
Wide span	16	80.0	2	40.0	18	72.0
Narrow span	4	20.0	3	60.0	7	28.0
Total	20	100.0	5	100.0	25	100.0

$\chi^2 = 3.17$, $df = 1$, $.09 < p < 0.1$ (MS)

5.8.2 Relationship between attendance of monthly in-service training and level of knowledge Front Line Staff have received

Table 5.26 shows that markedly lower percentage of FLS who attend monthly in-service training have relatively narrow range of knowledge whereas markedly higher percentage of FLS who did not attend in-service training have relatively wide range of knowledge. Chi-square analysis shows that there is statistically significant relationship ($\chi^2=5.59$, $df=1$, $p=0.018$) between attendance of monthly in-service training and level of knowledge of the FLS. FLS who have not attended monthly in-service training and having narrow range of knowledge contributed more than half of the significance difference. This result indicates that Front Line Staff who attended monthly in-service training have wide range of knowledge. This could be attributed to the fact that it was during these sessions where farmers' needs were discussed.



Table 5.26 Attendance of monthly in-service training and level of knowledge FLS have received

Level of knowledge of FLS	Attendance of monthly in-service training				Total	
	Yes		No		n	%
	n	%	n	%		
Wide span	18	78.3	0	0.0	18	72.0
Narrow span	5	21.7	2	100.0	7	28.0
Total	23	100.0	2	100.0	25	100.0

$$\chi^2 = 5.59, \text{ df} = 1, \text{ p} < 0.05$$

5.8.3 Relationship between attendance of induction training and level of knowledge FLS have received

Table 5.27 shows that there is no statistically significant relationship ($\chi^2=0.11$, $\text{df}=1$, $\text{p}=0.74$) between attendance of induction training and level of knowledge FLS have received. This indicates that notwithstanding the advantages induction training gives to Front Line Staff, it does not in any way affect their level of knowledge. The reasons that could be assigned for this is that content of the induction training did not dwell on needs of farmers as compared to what was taught during the in-service training sessions.

Table 5.27 Attendance of induction training and level of knowledge FLS have received

Level of knowledge of FLS	FLS attendance of induction training				Total	
	Yes		No		n	%
	n	%	n	%		
Wide span	4	66.7	14	73.7	18	72.0
Narrow span	2	33.3	5	26.3	7	28.0
Total	6	100.0	19	100.0	25	100.0

$$\chi^2 = 0.11, \text{ df} = 1, \text{ } 0.7 < \text{p} < 0.8 \text{ (NS)}$$

5.9 Relationship between some personal characteristics and level of knowledge of the Front Line Staff

This an attempt to find out whether different characteristics of FLS have effect on their knowledge.

5.9.1 Relationship between gender of FLS and level of knowledge received

Table 5.28 shows that there is no statistically significant relationship ($\chi^2=0.45$, $df=1$, $p=0.5$) between gender of Front Line Staff and the level of knowledge they have received. The result shows both male and female FLS have the same ability to learn whatever is taught during training sessions.

Table 5.28 Gender of FLS and level of knowledge received

Level of knowledge of FLS	Gender of FLS				Total	
	Male		Female		n	%
	n	%	n	%		
Wide span	15	75.0	3	60.0	18	72.0
Narrow span	5	25.0	2	40.0	7	28.0
Total	20	100.0	5	100.0	25	100.0

$\chi^2 = 0.45$, $df=1$, $0.5 < p < 0.7$ (NS)

5.9.2 Relationship between marital status of FLS and level of knowledge received

Table 5.29 shows that there is no statistically significant relationship ($\chi^2=0.11$, $df=1$, $p=0.74$) between marital status of Front Line Staff and the level of knowledge they have received.

Table 5.29 Marital status of FLS and level of knowledge received

Level of knowledge of FLS	Marital status of FLS				Total	
	Married		Single/divorced			
	n	%	n	%	n	%
Wide span	14	73.7	4	66.7	18	72.0
Narrow span	5	26.3	2	33.3	7	28.0
Total	19	100.0	6	100.0	25	100.0

$\chi^2 = 0.11$, $df = 1$, $0.7 < p < 0.8$ (NS)

5.9.3 Relationship between year of completion of agricultural college and level of knowledge FLS have received

Table 5.30 shows that there is no statistically significant relationship ($\chi^2 = 0.68$, $df = 1$, $p = 0.41$) between year of completion of agricultural college by FLS and the level of knowledge they have received.

Table 5.30 Year of completion of agricultural college and level of knowledge FLS have received

Level of knowledge of FLS	Year of completion of agric. college				Total	
	Up to 1987		1998-1997			
	n	%	n	%	n	%
Wide	11	78.6	7	63.6	18	72.0
Narrow	3	21.4	4	36.4	7	28.0
Total	14	100.0	11	100.0	25	100.0

$\chi^2 = 0.68$, $df = 1$, $0.3 < p < 0.5$ (NS)

5.9.4 Relationship between number of years in operational area and level of knowledge FLS have received

Table 5.31 shows that markedly higher percentage of FLS who have been in their operational areas between 1-3 years have narrow range of knowledge whereas markedly

lower percentage of FLS who have been in their operational areas for more than four years, have narrow range of knowledge. Chi-square analysis shows that there is statistical significant relationship ($\chi^2=4.09$, $df=1$, $p=0.04$) between number of years FLS have been in operational areas and their level of knowledge. FLS who have worked in their operational areas 1-3 years and have narrow range of knowledge contributed about half of the significance. This result indicates that Front Line Staff who have worked in their operational areas for longer years tended to have wider range of knowledge. This is because FLS become familiar with their environment. They also become aware of farmers' problems which are sent to the fortnight meetings for discussions and solutions to them. This will enable them have wider span of knowledge of farmers' needs.

Table 5.31 Number of years in operational area and level of knowledge Front Line Staff have received

Level of knowledge of FLS	Number of years in operational area				Total	
	1-3 years		More than 3 years		n	%
	n	%	n	%		
Wide span	3	42.9	15	83.3	18	72.0
Narrow span	4	57.1	3	16.7	7	28.0
Total	7	100.0	18	100.0	25	100.0

$\chi^2 = 4.09$, $df = 1$, $p < 0.05$

5.10 Summary

Majority of the Front Line Staff (FLS) were relatively young between the ages of 20-39 years (80%) and were males (98%) who are married (76%), attended Kwadaso Agricultural college (56%) and completed agricultural college on or before 1987 (56%). It was also observed that majority of them have spent four or more years in their operational areas(72%) and have worked with the Extension Department for ten or more

years (44%). Equal percentage (36%) of them have worked as Front Line Staff between 5-9 years and 10 or more years.

Majority (70%) of the Front Line Staff have received training at both the pre-service and in-service in crop production, livestock production and extension teaching methods. Majority (60%) however had no training in mushroom production, snail production, bee-keeping, aspects of extension delivery-adoption process, barriers to communication, non-verbal communication, channels of communication and characteristics of innovation. However more than 60% FLS received training in fish farming, WIAD activities, agro-forestry and post harvest technology only during in-service training periods.

Ninety-two percent of the FLS attended the monthly in-service training during the 1995/1996 training programmes where a wide range of topics were treated. However 60% of the them described the training to be inadequate. The critical reasons given were that the duration for each training session was short and no practical training was provided to them. Few (20%) of the Front Line Staff had the opportunity to attend a higher institution i.e. University, where they received training in crops, animal science, agricultural extension and agricultural economics.

It was observed that even though the Front Line Staff realised that going through induction training will give them insight of the job they will be doing, the Department of Agricultural Extension Services have not been conducting it for some time. Out of the twenty-five Front Line Staff interviewed, nineteen (76%) have not participated in it.

However evidence from the study showed that there was no statistical significant differences between the level of knowledge of Front Line Staff who were given induction training and those who were not given. This evidence suggest that induction training is not all that important as far as the level of knowledge of the Front Line Staff is concerned.

The recall of the FLS on training they have received in the various agricultural areas showed that they received high training in crops, post harvest technology, and livestock production in that descending order. But in areas like Snail production, Beekeeping, Mushroom production, Fish farming and WIAD activities, they received little or no training. Based on the span of knowledge of the Front Line Staff, 72% were classified as having wide span of knowledge while 28% were of narrow span of knowledge.

The relationship between types of training, personal and socio-economic characteristics of the Front Line Staff and their span of knowledge on the extension training needs of the farmers showed that attendance of in-service training, the number of years in operational area, all had statistical significant effect on the level of knowledge of the Front Line Staff. This indicates the importance of these. Front Line Staff (FLS) who attended monthly in-service training or stayed in their operational areas for four or more years tended to have wide span of knowledge in agricultural activities that the farmers are engaged in. This is because most of the new/innovative agricultural activity areas such as snail and mushroom farming etc. tended to be taught at the in-service training levels rather than the pre-service and induction training levels.

Currently the curricula of schools (where pre-service training is provided) where the FLS attended do not offer training in such subjects. Also the longer one has stayed in a place, the longer the likelihood of attending more in-service training relevant to the area. It is imperative that FLS are transferred less frequently. Regular in-service training provides important opportunity for FLS to receive training in a wider span of enterprise areas, which are needed by the farmers they serve. The number of types of training, attendance of induction training, gender, marital status were found not to be important determinants of span of knowledge on needs of the farmers that extension workers have received. Thus indicating that personal characteristics, and some types of training are not key to improving the span of knowledge of extension workers.



CHAPTER SIX

DETERMINANTS OF SPAN OF FARMERS' KNOWLEDGE

6.0 Introduction

The previous section sought to unearth the nature and contents of training the Front Line Staff have received at the pre-service, induction and in-service training periods. It is hypothesized that when the agricultural extension workers are trained in the contents of the extension training needs of farmers, they are likely to provide training to farmers that will address the needs of the farmers. This chapter shows from the farmers point of view the nature and content of extension programmes they have participated in and the methods of delivery used by the Front Line Staff. The focus will be on the knowledge of farmers in some technological packages and the methods and channels of communication used by the Front Line Staff to present technical messages to them. It also shows the categories of farmers depending on the kind of FLS they work with and identifies any relationship between these categories of farmers and their knowledge in the different technological packages. It however first describes some personal and socio-economic characteristics of the farmers.

6.1 Personal and socio-economic characteristics of farmers

This is determined to find out the kind of farmers that FLS are working in the study area. The characteristics considered are gender, age, educational background, source

of farm labour, size of extra household labour, total farmland available to farmers, total land owned by farmers, farming experience and purpose of farming.

6.1.1 Gender of farmers

Table 6.1 shows that out of total of 120 farmers interviewed ninety-four (78.3%) are males while twenty-six (21.7%) are females. This result shows clearly the relationship between FLS and the different sexes. Because a greater percentage of the FLS were males, they tended to relate more with male farmers.

Table 6.1 Gender distribution of farmers

Sex	Frequency	Percent
Male	94	78.3
Female	26	21.7
Total	120	100.0

Source :Field survey-1997

6.1.2 Age of farmers

Table 6.2 shows that more than two-thirds (75.8%) of the farmers are among 20-49 year age group while the remaining 24.2% are 50 years or more. Whilst many people have the opinion that most of our farmers are aged, the result of this study suggests a youthful farmer population therefore giving an indication that the youth are going into farming. It shows that if appropriate technologies and the necessary incentives are given to farmers, they will be motivated to adopt technical messages given by FLS to improve their standard of living.

Table 6.2 Age distribution of farmers

Age of farmers	Frequency	Percent
20 - 49 years (Young)	91	75.8
50yrs and above (Old)	29	24.2
Total	120	100.0

Source: Field survey-1997

6.1.3 Educational background

Table 6.3 shows that majority (83.3%) of the farmers interviewed have not attended school before or have low education which comprise of farmers who have completed middle school or junior Secondary School. There are only 16.7% of them who have higher education i.e. have O' or A' Level certificates. Because a greater percentage of farmers have low or no education, it suggests that FLS should use appropriate extension methods and channel of communication to disseminate information to them. Individual or group methods and use of spoken and visual channels of communications would be preferred by farmers (Maunder, 1973).

Table 6.3 Educational background of farmers

Educational background	Frequency	Percent
No schooling /low education	100	83.3
High education	20	16.7
Total	120	100.0

Source: Field survey-1997

6.1.4 Source of farm labour

Three categories of farm labour source were identified. Nineteen farmers(15.8%) indicated they do not hire any labour on their farms but either do the work themselves, or get help from the nuclear family members and friends. More than 50% of the farmers indicated they rely on family members as well as hired labour for

their farming activities. There are however another 30.8% of the farmers who said they rely on family members, hired labour and friends to work on their farms as shown in Table 6.4. The proportion of the farmers who use nuclear family labour is rather high. The result shows that nuclear family labour is an important component of farming in the study area. Its absence have led more farmers to resort to hired labour.

Table 6.4 Source of farm labour

Farm Labour Source	Frequency	Percent
Self/Family/Friend	19	15.8
Family/Hired	64	53.4
Family/Hired/Friends	37	30.8
Total	120	100.0

Source: Field survey-1997

6.1.5 Size of extra household labour available to farmers

Table 6.5 shows that majority(63.3%) of farmers have very few (0-3) household labour helping on their farms while 36.7% of the farmers have access to between four to twelve people from their household. The low nuclear family labour necessitated the use of extended family labour. However, high proportion of farmers (63.3%) have few household labour available to them. This could account for the high level of labour hire to some extent.

Table 6.5 Size of extra household labour available to farmers

Size of household Labour	Frequency	Percent
0- 3 (Low household labour availability)	76	63.3
4 - 12 (High household labour availability)	44	36.7
Total	120	100.0

Source: Field survey-1997

6.1.6 Total farmland available to farmers

Table 6.6 shows that out of the 120 farmers interviewed, only four (3.3%) have farmland size of above 30 acres available to them for farming. More than half of the sample (55.0%) rather have relatively small farmlands between one to five acres while 41.7% of the farmers have relatively large farmlands of size between 6-30 acres. The result suggests that a greater proportion of farmers work on small sizes of lands. Since size of land affects adoption of technologies (Feder et al. 1982), certain innovations will not be adopted by farmers. It indicates that size of land of farmers should be considered before technologies are sent to them.

Table 6.6 Total farmland available to farmers

Farm Land size (acreage)	Frequency	Percent
Relatively small (<1-5)	66	55.0
Relatively large (6 - 30)	50	41.7
Large (above 30)	4	3.3
Total	120	100.0

Source: Field survey-1997

6.1.7 Total land owned by farmers

Even though size of land available to farmers is important, ownership of land could hold the key to adoption. Because of this farmers were categorised into landowners and tenants according to how much of the size of the total farmland available to them for farming they own. Table 6.7 shows that more than half of the respondents (55%) are landowners who own more than 50 % of farmland available to them for farming. The remaining fifty-four farmers who constitute 45% of the sample are tenants who own less than 50% of their total farmlands. The result suggests that a greater percentage of the farmers are landowners who could take decisions on their own concerning innovations.

Table 6.7 Categories of land ownership

Category of Ownership	Frequency	Percent
Landowners (51-100%) of farmland	66	55.0
Tenants (0-50%) of farmland	54	45.0
Total	120	100.0

Source: Field survey-1997

6.1.8 Farming experience

Concerning experience in farming, sixty-five (54.2%) farmers indicated they have experience ranging from between 1-14 years. The rest (45.8%) also have more than 14 years farming experience as shown in Table 6.8. 'Experience is the best teacher', as the adage goes, and so since a higher proportion of the farmers are experienced in farming, they will not have much problems in going about their farming activities.

Table 6.8 Farming experience of farmers

No. of years	Frequency	Percent
Up to 14 years	65	54.2
More than 14 years	55	45.8
Total	120	100.0

Source ; Field survey-1997

6.1.9 Purpose of farming

Table 6.9 shows that almost all the farmers (95.8%) are in farming for both subsistence and commercial purposes. There are three (2.5%) farmers who indicated they are in farming solely for commercial reasons while two (1.7%) also said they only farm just to feed themselves. The high proportion of farmers who farm for both subsistence and commercial purposes shows that they have taken farming as a business. This suggests that farmers will adopt appropriate technologies

disseminated to them in order to obtain the maximum benefit from the piece of land available to them.

Table 6.9 Farmers purpose of farming

Purpose of farming	Frequency	Percent
Subsistence	2	1.7
Commercial	3	2.5
Subsistence/Commercial	95	95.8
Total	120	100.0

Source :Field survey-1997

6.2 Extension Contact

This include the frequency of contact and extension methods used by the FLS.

6.2.1 Frequency of contact

Table 6.10 shows that sixty-seven (55.8%) of the farmers indicated they received frequent visits from the Front Line Staff while fifteen (12.5%) received infrequent visits. There were however twenty-one (17.5%) who hardly received any visit from the Front Line Staff. This indicates that over half of the sampled farmers had frequent contacts with the FLS. There were seventeen (14.2%) farmers who indicated they do not work with the FLS

Table 6.10. Frequency of contact from FLS

Frequency of contact	Freq.	Percent
Frequent visits (Fortnightly/weekly/daily)	67	55.8
Infrequent visits (Monthly/bi-monthly)	15	12.5
Rare visits**(>2months/cannot tell)	21	17.5
Do not work with FLS	17	14.2
Total	120	100.0

Source: Field Survey-1997

6.2.2 Extension methods used by Front Line Staff

Farmers indicated in Table 6.11 that more of the Front Line Staff were using either one or two (52.5%) while few use three (33.3%) extension methods to reach out to them. Seventeen (14.2%) of them indicated they had not received any message from the Front Line Staff as such no method was used on them. It is seen that most of the farmers (52.5%) have been contacted using only one or two extension methods.

Table 6.11 Extension methods used by FLS

Extension methods used	Frequency	Percentage
One method/ Two methods	63	52.5
Three methods	40	33.3
Don't work with FLS	17	14.2
Total	120	100.0

Source: Field Survey-1997

6.3 Farmers' span of knowledge

The span of knowledge of farmers as a result of their interaction with farmers were determined in the area of crop production, post harvest, agro-forestry, livestock production, fish farming, WIAD activities, group formation, business planning and non- traditional farming.

6.3.1 Farmers' knowledge on technological package for crop production

Technological package on crop production comprises of row planting, use of hybrid variety, fertilizer application, insecticide/fungicide application, timely weeding, timely harvesting, split corm technique of plantain and yam minisett technology.

Two categories i.e. wide, and narrow were used to determine the level of knowledge farmers have in crop production. Farmers who have knowledge in six or more of the

above were classified to have wide knowledge, while farmers who have knowledge in 5 or less were classified as having narrow knowledge. Table 6.12 shows that 60% have wide knowledge and 25.8% have narrow knowledge in crop production. Most of the farmers (60%) have wide span of knowledge in crop production.

Table 6.12 Level of knowledge of farmers in crop production.

Level of knowledge	Frequency	Percent
Wide span of knowledge (8-6 items)	72	60.0
Narrow span of knowledge (5 - 0 items)	31	25.8
Don't work with FLS	17	14.2
Total	120	100.0

Source: Field survey-1997

6.3.2 Farmers' knowledge on technological package for post harvest

Three items namely chemical treatment of maize, construction of narrow crib and storing of treated maize in narrow cribs are considered under technological package on post harvest. Farmers who have knowledge in two to three of the items are classified to have wide knowledge while those who have knowledge in only one or nothing are classified to have narrow knowledge. Table 6.13 shows that with the exception of the seventeen farmers who indicated they did not work with the Front Line Staff, 55.8% of the farmers were found to have wide knowledge in post harvest technology while the remaining 30% had narrow knowledge. Most of the farmers (55.8%) have wide span of knowledge in post harvest technology.

Table 6.13 Level of knowledge farmers in post harvest

Level of knowledge	Frequency	Percent
Wide span of knowledge (3-2 items)	67	55.8
Narrow span of knowledge (1- 0 item)	36	30.0
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997

6.3.3 Farmers' knowledge on technological package for agro-forestry practice

This includes farmers' knowledge in the types of agro-forestry practices, the benefits and the types of plants available for the practice. Farmers who had knowledge in two or more were classified as having wide knowledge whilst those with knowledge in only one or none also classified as having narrow span of knowledge. Table 6.14 shows that out of the one hundred and twenty (120) farmers interviewed, forty-eight (40.0%) of the them have wide knowledge on agro-forestry practice while fifty-five (45.8%) other farmers have narrow knowledge in agro-forestry. The remaining seventeen (14.2%) do not work with the Front Line Staff. More of the farmers (45.8%) have narrow span of knowledge on agro-forestry practices.

Table 6.14 Level of knowledge of farmers in agro-forestry package

Knowledge Level	Frequency	Percent
Wide span of knowledge (2-3 items)	48	40.0
Narrow span of knowledge (1-0 item)	55	45.8
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997



6.3.4 Farmers' knowledge on technological package for livestock production

Technological package on livestock production included the use of improved breeds, proper housing of animals, proper feeding, dry season feeding of farm animals, proper watering of animals and good sanitation in animal pen. Two categories were used. Farmers who had knowledge in five or more of the items were classified to have wide knowledge while those with knowledge in four or less were also classified to have narrow knowledge. Table 6.15 shows that about half of the farmers (50.8%) have wide knowledge in livestock production, and forty-two farmers (35%) have narrow knowledge. The remaining farmers (14.2 %) do not work with the Front Line

Staff. This indicates that more of the farmers (50.8%) have wide span of knowledge in livestock production.

Table 6.15 Level of knowledge of farmers in livestock production

knowledge Level	Frequency	Percent
Wide span of knowledge (6-5 items)	61	50.8
Narrow span of knowledge (4-0 items)	42	35.0
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997

6.3.5 Farmers' knowledge on technological package for fish farming

Technological package on fish farming includes site selection, construction of pond, stocking, feeding, pond maintenance and harvesting of fishes. Two categories were used. Farmers who had knowledge in five or more of the activities were classified as having wide span of knowledge, while those with knowledge in four or less were classified as having narrow knowledge. Table 6.16 shows that greater percentage (71.6%) of farmers have no knowledge in fish farming. Only seventeen (14.2%) farmers have wide knowledge in fish farming while seventeen (14.2%) also indicated they do not work with the Front Line Staff. This indicates that farmers in the study area have narrow knowledge in fish farming.

Table 6.16 Level of knowledge of farmers in fish farming

Level of knowledge	Frequency	Percent
Wide span of knowledge (5-6 items)	17	14.2
Narrow span of knowledge (4-0 items)	86	71.6
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997

6.3.6 Farmers' knowledge in technological package on WIAD activities

Technological package on WIAD activities include soya milk preparation, incorporation of soyabean to dishes, construction of smokeless stove and simple methods of preserving vegetables. Two categories, wide and narrow are used. Farmers who have knowledge in three or more of the above are considered to have wide knowledge while those who have two or less are considered to have narrow knowledge. Table 6.17 shows that only eight farmers (6.7%) have wide span of knowledge in WIAD activities. Majority (79.2%) of the farmers however have narrow span of knowledge in WIAD activities.

Table 6.17 Level of knowledge of farmers in WIAD activities

Level of knowledge	Frequency	Percent
Wide span of knowledge (4 -3 packages)	8	6.6
Narrow span of knowledge (2- 0 packages)	95	79.2
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997

6.3.7 Farmers' knowledge on formation of farmers groups

Technological package on group formation includes farmers' knowledge on how groups are formed, importance of forming groups and benefits obtained as group member. Farmers with knowledge in two or three were classified as having wide knowledge while those with knowledge in only one have narrow knowledge.

Table 6.18 shows that a high percentage (81.6%) of the farmers have wide knowledge in it. Only five (4.2%) farmers have narrow knowledge.

Table 6.18 Level of knowledge of farmers in group formation

Level of knowledge	Frequency	Percent
Wide span of knowledge (2-3items)	98	81.6
Narrow span of knowledge(0-1 item)	5	4.2
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997

6.3.8 Farmers' knowledge on technological package in business planning

Technological package on business planning includes knowledge in planning farming activities and farm record keeping. A farmer with knowledge in all the two components was classified as having wide knowledge while those with knowledge in only one or none had narrow knowledge. Table 6.19 shows that fifty-eight (48.3%) of the farmers have wide knowledge while 37.5% have narrow knowledge.

Table 6.19 Level of knowledge of farmers in business planning

Level of knowledge	Frequency	Percent
Wide span of knowledge (All 2 items)	58	48.3
Narrow span of knowledge (1-0item)	45	37.5
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997

6.3.9 Farmers' knowledge in technological package on non-traditional farming

Three items, snail production, mushroom productions and bee-keeping form the package on non-traditional farming. Farmers who have knowledge in two or more are considered to have wide knowledge while farmers who have knowledge in one or none have narrow knowledge in non-traditional farming enterprise. Table 6.20 shows that majority (77.5%) of the farmers have narrow knowledge while only 8.3% have wide knowledge in non-traditional farming.

Table 6.20 Level of knowledge of farmers in non-traditional farming enterprise.

Level of knowledge	Frequency	Percent
Wide span of knowledge (2-3 packages)	10	8.3
Narrow span of knowledge (0-1 package)	93	77.5
Don't work with FLS	17	14.2
Total	120	100.0

Source : Field survey-1997

6.3.10 Overall level of knowledge of farmers

Information on packages on nine enterprise areas: crops, livestock, agro-forestry practices, fish farming, group formation, post harvest, WIAD activities, business planning and non-traditional farming were given to farmers. Based on the number of enterprises which farmers have wide knowledge in, farmers who have wide knowledge in five or more of these enterprises (i.e. above 50%) were classified as having an overall wide span of knowledge whilst those with knowledge in four or less were classified as having overall narrow span of knowledge in the packages introduced. Table 6.21 shows that 44 farmers which represent 36.7% have an overall wide span of knowledge while fifty-nine (49.1%) other farmers have an overall narrow span of knowledge. Thus in terms of overall span of knowledge, only slightly more than a third of the farmers had wide span of knowledge, the remaining had either narrow span or did not work with the Front Line Staff.

Table 6.21 Overall level of knowledge of farmers

Overall level of knowledge.	Frequency	Percentage
Wide span of knowledge	44	36.7
Narrow span of knowledge	59	49.1
Don't work with FLS	17	14.2
Total	120	100

Source: Field survey-1997

6.3.11 Distribution of farmers working with Front Line Staff with training covering a wide or narrow span of knowledge

Table 6.22 shows that seventy-seven (74.8%) of the farmers worked with FLS with wide span of knowledge while thirty-six (25.2%) of them also worked with FLS of narrow span.

Table 6.22 Farmers working with FLS with wide or narrow span of knowledge

Category of FLS	Frequency of farmers	Percentage
Wide span FLS	77	74.8
Narrow span FLS	26	25.2
Total	103	100.0

Source: Field Survey-1997



6.3.12 Relationship between frequency of visits by FLS and farmers overall level of knowledge

Table 6.23 shows that there is statistically significant relationship ($\chi^2=6.48$, $df=2$, $p<0.05$) between frequency of visits by Front Line Staff and farmers overall level of knowledge. Markedly lower percentage of farmers who were rarely visited by the Front Line Staff had wide knowledge whilst a higher percentage of farmers who received frequent visits had wide knowledge. This suggests that the more FLS visit farmers with innovations, the greater the chances of farmers having wider span of knowledge in their agricultural enterprises.

Table 6.23 Frequency of visits by FLS and overall level of knowledge of farmers

Overall level of knowledge of farmers	Frequency of visits by FLS						Total	
	Frequent visits		Infrequent visits		Rare visits		n	%
	n	%	n	%	n	%	n	%
Wide knowledge.	34	50.7	6	40.0	4	19.05	44	42.7
Narrow knowl.	33	49.3	9	60.0	17	80.95	59	57.3
Total	67	100.0	15	100.0	21	100.0	103	100.0

$\chi^2=6.48$, $df=2$, $p<0.05$

6.3.13 Relationship between the number of types of extension methods used by FLS to contact them and overall level of knowledge of farmers

Table 6.24 shows that there is no statistically significant differences ($\chi^2=1.4$, $df=1$, $0.2<p<0.3$) between farmers contacted through different extension methods with regards to overall level of knowledge of farmers. Farmers who were contacted through three or more extension methods did not have any advantage in overall span of knowledge compared to those contacted through only one or two method(s). Even though it was expected that the use of multiplicity of extension methods will enhance the knowledge level of farmers, the result has shown otherwise. This indicates that it is not enough to use multiple extension methods on farmers but that other issues such as frequency of visit, might be of importance.

Table 6.24 Number of types of extension methods used and overall level of knowledge of farmers

Overall level of knowledge of farmers	No of types of extension methods used.				Total	
	One/two methods		Three methods		n	%
	n	%	n	%		
Wide knowledge	24	38.1	20	50.0	44	42.7
Narrow knowl.	39	61.9	20	50.0	59	57.3
Total	63	100.0	40	100.0	103	100.0

$\chi^2=1.4$, $df=1$, $0.2 < p < 0.3$ (NS)

6.3.14 Relationship between farmers of FLS with wide or narrow span of knowledge and overall level of knowledge of farmers

Table 6.25 shows no statistically significant relationship ($\chi^2=1.22$, $df=1$, $0.2 < p < 0.3$) between farmers of FLS with wide or narrow span of knowledge and the overall level of knowledge of farmers. Thus indicating that the span of knowledge of the FLS is not a determinant of the overall knowledge level of farmers.

Table 6.25 Farmers of FLS with wide or narrow span of knowledge and overall level of knowledge of farmers

Overall level of knowledge of farmers	Farmers of FLS with wide or narrow span of knowledge				Total	
	Wide span		Narrow span		n	%
	n	%	n	%		
Wide knowledge	35	45.5	9	34.6	44	42.7
Narrow knowledge	42	54.5	17	65.4	59	57.3
Total	77	100.0	31	100.0	103	100.0

$\chi^2=1.22$, $df=1$, $0.2 < p < 0.3$ (NS)

6.3.15 Relationship between farmers working with FLS with wide or narrow span of knowledge and frequency of contact with FLS

Table 6.26 shows there is no statistically significant differences ($\chi^2=3.57$, $df=2$, $0.2 < p < 0.3$) between farmers of FLS with wide or narrow span of knowledge and their frequency of contact with Front Line Staff. This shows that the knowledge level of FLS has no influence on the frequency of contact with their farmers.

Table 6.26 Relationship between farmers of FLS with wide or narrow span of knowledge and frequency of contact from FLS

Frequency of contact	Farmers of FLS with wide or narrow span of knowledge				Total	
	Wide span		Narrow span		n	%
	n	%	n	%		
Frequent visits	54	70.1	13	50.0	67	65.0
Infrequent visits	10	13.0	5	19.2	15	14.6
Rare visits	13	16.9	8	30.8	21	20.4
Total	89	100.0	26	100.0	103	100.0

$\chi^2 = 3.57$, $df=2$, $0.2 < p < 0.3$ (NS)

6.3.16 Relationship between farmers working with FLS with wide or narrow span of knowledge and number of extension methods used by FLS to contact them.

Table 6.27 shows no statistically significant differences ($\chi^2=0.26$, $df=1$, $0.5 < p < 0.7$) between farmers of FLS who have wide or narrow span of knowledge and the different extension methods used by the Front Line Staff to reach them. Thus knowledge of the FLS is not a determinant of the different extension methods used to contact their farmers.

Table 6.27 Farmers of FLS with wide or narrow span of knowledge and number of extension methods used by Front Line Staff to contact them.

Number of extension methods used	farmers of FLS with wide or narrow span of knowledge				Total	
	Wide span		Narrow span		n	%
	n	%	n	%		
One/two method(s)	46	59.7	17	65.4	63	61.2
Three methods	31	40.3	9	34.6	40	38.8
Total	77	100.0	26	100.0	103	100.0

$\chi^2=0.26$, $df=1$, $0.5 < p < 0.7$ (NS)

6.5 Summary

Majority of the farmers interviewed are males and between the ages of 20-49 years. Most of them have low education. Many of the farmers (84.2%) use hired labour. This appears to be because most of them had few extended family sources of labour (63.3%). Most farmers have relatively small acreage of land (1-5 acres) available to them for farming, however most are land owners who own more than 50% of their farm lands. Majority of the farmers have farming experience of not more than 14 years (54.2%), while most of them (95.8%) farm for both subsistence and commercial purposes. Majority of the farmers (74.8%) were farmers of FLS with wide span of knowledge, while 25.2% were farmers of FLS having narrow span of knowledge in the agricultural activities of their farmers.

The overall level of knowledge of farmers in all the technologies were determined. Two categories of farmers i.e. those with wide and narrow span of knowledge. A lower percentage (36.7%) were found in the wide knowledge category whilst a greater percentage (49.1%) were found in the narrow knowledge category.



Most of them (74.2%) are farmers of FLS who have received wide span of knowledge on the agricultural activities that the farmers in the study area are engaged in. Most farmers have had frequent extension contact (55.8%), although such contacts have been done using only one or two types of extension methods (53.5%). There is statistical significant relationship ($\chi^2=6.48$, $df=2$, $p<0.05$) between frequency of visit by FLS and the span of knowledge of farmers. There is no statistical significant relationship ($\chi^2=1.4$, $df=1$, $0.2>p<0.0$) between number of extension methods used and span of knowledge of farmers. The span of knowledge of farmers is not related to the kind of FLS they work with. The span of knowledge of FLS has no influence on the frequency with which they contact their farmers and the number of extension methods used however farmers' overall knowledge is related to the frequency of contact they receive from the FLS.

In conclusion, the span of knowledge of farmers on their farming activities is determined by the frequency of visit and not the multiplicity of the extension methods used to contact them or the span of knowledge of the Front Line Staff they work with. Thus, indicating that irrespective of the span of knowledge of the FLS, if farmers are not frequently contacted, their span of knowledge will not be improved. This suggests that in addition to frequent in-service training for FLS, there is the need to equip them to make frequent contacts.



CHAPTER SEVEN

PERFORMANCE OF THE FRONT LINE STAFF

7.0 Introduction

The nature and content of training farmers have received is likely to reflect their level of knowledge in various technological packages, so also is methods used. Together, these two are considered important to enhance awareness and adoption. It is hypothesized that if the training needs of the farmers are met, farmers will adopt the technologies. In this chapter, the performance of the Front Line Staff is measured by the adoption pattern of their farmers for the various technological packages. The adoption pattern is categorized into full adoption, partial adoption and non-adoption of the packages. Relationship between the knowledge level of the farmers of extension workers (FLS) of different levels of knowledge, and the knowledge level of farmers and adoption of the various technological packages is also examined in this chapter.

7.1 Adoption of technologies delivered to farmers

The adoption behaviour of farmers in the following technologies i.e. crop production, post harvest, agro-forestry, livestock production, fish farming, WIAD activities, group formation, business planning and non-traditional farming were determined.

7.1.1 Adoption of package on crop production technology

Table 7.1 shows that just about a third (34.2%) of the farmers fully adopted the package on crop production which include row planting, use of hybrid varieties,

timely weeding, fertilizer application, timely harvesting, split corm technique of plantain, use of insecticide/fungicides and yam miniset technology. However, more than half of the farmers partially adopted the package. There was no farmer who did not adopt any of the package.

Table 7.1 Adoption pattern of crop technology.

Pattern of Adoption	Frequency	Percent
Full Adoption (6-8 of the package)	41	34.1
Partial Adoption (adopted between 1 and 5 of the package)	62	51.7
Non Adoption (adopted none of the packages)	0	0.0
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.2 Adoption of package on post harvest technology

Table 7.2 shows that 20% of the farmers adopted fully the package on post harvest technology with 35% partially adopting the package while 30.8% did not adopt any component of the package.

Table 7.2 Adoption pattern of post harvest technology.

Pattern of Adoption	Frequency	Percent
Full Adoption (adopted between 2 and 3 of the packages)	24	20.0
Partial Adoption (adopted only 1 of the packages)	42	35.0
Non Adoption (adopted none of the packages)	37	30.8
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey

7.1.3 Adoption of package on agro-forestry

In the area of agro-forestry, majority (75.8%) of the farmers did not adopt the package.

Only 10% of the farmers adopted the package.

Table 7.3 Adoption pattern of agro-forestry package.

Pattern of Adoption	Frequency	Percent
Full adoption (adopted all package)	12	10.0
Non Adoption (adopted none)	91	75.8
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.4 Adoption of package on livestock

Table 7.4 shows that fifteen farmers (12.5%) adopted fully the package on livestock technology. There are about 40.0 % of the farmers who adopted some of the components of the package while 33.3% did not adopt any.

Table 7.4 Adoption pattern of livestock technology.

Pattern of Adoption	Frequency	Percent
Full Adoption (adopted between 5 and 6 of the packages)	15	12.5
Partial Adoption (adopted between 1 and 4 of the packages)	48	40.0
Non Adoption (adopted none of the packages)	40	33.3
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.5 Adoption of package on fish farming technology

Table 7.5 shows that aside the seventeen farmer (14.2%) who do not work with the Front Line Staff, all the one hundred and three farmers (85.8%) who work with the Front Line Staff did not adopt the technology on fish farming.

Table 7.5 Adoption pattern of fish farming.

Pattern of Adoption	Frequency	Percent
Full Adoption (pond construction to harvesting)	0	0.0
Non Adoption (did not adopt)	103	85.8
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.6 Adoption of package on WIAD activities

More than half (55.8%) of the farmers interviewed did not adopt the package on WIAD activities. There are about 30% who adopted some components of the package, however no farmer fully adopted the package as shown in Table 7.6.

Table 7.6 Adoption pattern of WIAD activities.

Pattern of Adoption	Frequency	Percent
Full Adoption (adopted between 3 and 4 of the packages)	0	0.0
Partial Adoption (adopted 1- 2 of the packages)	36	30.0
Non Adoption (adopted none of the packages)	67	55.8
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.7 Adoption of package on group formation

Table 7.7 shows that seventy-six (63.3%) of the farmers have knowledge about group activities and belong to groups while twenty-seven (22.5%) farmers have knowledge but are not involved in any group formation activities.

Table 7.7 Adoption pattern of group formation.

Pattern of Adoption	Frequency	Percent
Full Adoption (knowledge to group membership)	76	63.3
Non Adoption (knowledge but not a group member)	27	22.5
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.8 Adoption of package on business planning

Table 7.8 shows that 33.3% of the farmers fully adopted the package on business planning, 24.2 % adopted it partially while 28.3% did not adopt anything.

Table 7.8 Adoption pattern of business planning.

Pattern of Adoption	Frequency	Percent
Full Adoption (adopted all 2 packages)	40	33.3
Partial Adoption (adopted only 1 of the packages)	29	24.2
Non Adoption (adopted none)	34	28.3
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.9 Adoption of package on non-traditional farming enterprise

Table 7.9 shows that ninety-nine (82.5%) of the farmers did not adopt any component of the package on non-traditional farming enterprise. Four farmers (3.3%) partially adopted the package while seventeen farmers (14.2%) do not work with the Front Line Staff. No farmer fully adopted the package.

Table 7.9 Adoption pattern of package for non-traditional farming enterprise

Pattern of Adoption	Frequency	Percent
Full Adoption (adopted all 3 packages)	0	0.0
Partial Adoption (adopted 1- 2 of the packages)	4	3.3
Non Adoption (adopted none)	99	82.5
Don't work with FLS	17	14.2
TOTAL	120	100.0

Source: Field Survey-1997

7.1.10 Summary of the adoption pattern for the various agricultural enterprises

Table 7.10 shows that 63.3% of farmers fully adopted the package on group formation. This is ranked first in the full adoption category. It is followed by crop technology (34.1%), business planning (33.3%), post harvest technology (20%),

livestock technology (12.5%), agro-forestry (7.5%) in that order while technologies on WIAD activities and non-traditional farming are ranked last. In the partial adoption category, crop technology ranked first with 51.7% of the farmers. This is followed by livestock (40%), post harvest technology (35%) in that order. Technology on agro-forestry, fish farming, and group formation are ranked last.

Mean ranking for the two adoption patterns shows that crop technology ranks highest with a mean of 42.9%, followed by group formation, business planning, post harvest technology, WIAD activities, agro-forestry technology, non-traditional farming and fish farming as shown in Table 7. 10. This trend can be attributed to the fact that more than half of the farmers have higher knowledge in crop, post harvest technology, livestock technology and group formation compared to their knowledge in WIAD activities, fish farming, and non-traditional farming. The high knowledge of farmer in these technologies are also a reflection of the kind of training the Front Line Staff have received. Evidence from the data shows that farmers have high knowledge in technologies which Front Line Staff received adequate training in.

Table 7.10 Summary of adoption pattern for the various farming enterprises.

Farming enterprises	Full adoption		Partial adoption		Mean % Adoption	Mean Ranking
	%	Ranking	%	Ranking		
Crop Technology	34.1	2	51.7	1	42.9	1
Group Formation	63.3	1	0.0	7	31.7	2
Business Planning	33.3	3	24.2	5	28.7	3
Post harvest Technology	20.0	4	35.0	3	27.5	4
Livestock Technology	12.5	5	40.0	2	26.3	5
WIAD activities	0.0	7	30.0	4	15.0	6
Agro-forestry Technology	10.0	6	0.0	7	5.0	7
Non-Traditional Farming	0.0	7	3.3	6	1.7	8
Fish-farming Technology	0.0	7	0.0	7	0.0	9

7.1.11 Overall adoption pattern of farmers

The overall adoption pattern of the technological packages presented to farmers were determined using the following criteria. All farmers who adopted five or more of the technologies introduced to them were classified as full adopters, those who adopted less than five of the technologies were classified as partial adopters while those who did not adopt any were classified as non-adopters. Table 7.11 shows that three (2.5%) farmers fully adopted technologies, while majority, 83.3% of the farmers partially adopted the technologies. The remaining 14.2% did not work with the FLS.

Table 7.11 Overall adoption pattern of farmers

Overall adoption pattern	Frequency	Percentage
Full adoption (adopted 5 or more of the technologies)	3	2.5
Partial adoption (adopted less than 5 of the tech)	100	83.3
Do not work with FLS	17	14.2
Total	120	100.0

Source: Field Survey-1997

7.2 Relationship between extension contact and overall adoption pattern of farmers

This is determined to show whether there is any relationship between frequency of contact, number of types of extension methods used and overall adoption pattern of farmers.

7.2.1 Relationship between frequency of contact by FLS to farmers and overall adoption pattern of farmers

Table 7.12 shows that there is no statistically significant relationship ($\chi^2=0.73$, $df=2$, $0.5 < p < 0.7$) between frequency of visit by FLS and overall pattern of adoption of farmers. Markedly lower percentage of farmers who received infrequent visits from

the FLS are found in the full adoption category. The result suggests that adoption of innovation does not depend on how frequent farmers are visited but other factors also play major role.

Table 7.12 Frequency of visits by FLS and overall adoption pattern of farmers

Overall adoption pattern of farmers	Frequency of visits						Total	
	Frequent visits		Infrequent visits		Rare visits		n	%
	n	%	n	%	n	%		
Full adoption	2	3.0	0	0.0	1	4.8	3	2.9
Partial adoption	65	97.0	15	100.0	20	95.2	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0	0	0.0
Total	67	100.0	15	100.0	21	100.0	103	100.0

$\chi^2=0.73$, $df=2$, $0.5 < p < 0.7$ (NS)

7.2.2 Relationship between number of types extension methods used and overall adoption pattern of farmers

Table 7.13 shows that there is statistically significant relationship ($\chi^2=4.63$, $df=1$, $p < 0.05$) in the adoption pattern of farmers contacted through number of types of extension methods. Markedly lower percentage of farmers contacted through one or two extension methods are found in the full adoption category whilst markedly higher percentage of farmers who were contacted through the same are found in the partial adoption category. This indicates that as the number of types extension methods used by FLS increases, farmers tend to adopt more of the technologies disseminated to them.

Table 7.13 Farmers contacted through different extension methods and overall adoption pattern of technologies

Overall adoption pattern of farmers	Different extension methods used				Total	
	One/two method(s)		Three methods		n	%
	n	%	n	%		
Full adoption	0	0.0	63	63.0	63	61.2
Partial adopt.	3	100.0	37	37.0	40	38.8
Non adoption	0	0.0	0	0.0	0	0.0
Total	3	100.0	100	100.0	103	100.0

$$\chi^2=4.63, \text{ df}=1, \text{ p}<0.05$$

7.3 Relationship between farmers of FLS with wide or narrow span of knowledge and overall adoption pattern

Table 7.14 shows that there is relationship between categories of farmers and their overall adoption pattern for the technologies introduced by the Front Line Staff. Markedly lower percentage of farmers of FLS with wide span of knowledge are found in the full adoption category while markedly higher percentage of farmers of FLS with narrow span of knowledge are found in the full adoption category. The relationship was however marginally statistically significant ($\chi^2=2.82, \text{ df}=1, 0.1<\text{p}<0.05$). Thus indicating that span of knowledge of FLS farmers' work with does not necessary determine the adoption behaviour of farmers.

Table 7.14 Farmers of FLS with wide or narrow span of knowledge and their overall adoption pattern

Overall adoption pattern of farmers	Farmers of FLS of different knowledge levels				Total	
	High/wide		Low/narrow		n	%
	n	%	n	%		
Full adoption	1	1.3	2	7.7	3	2.9
Partial adoption	76	98.7	24	92.3	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0
Total	77	100.0	26	100.0	103	100.0

$$\chi^2=2.82, \text{ df}=2, 0.1<\text{p}<0.05 \text{ (MS)}$$

7.4 Relationship between farmers with wide or narrow span of knowledge of farmers and overall adoption pattern of farmers

Table 7.15 shows that there is statistically significant relationship ($\chi^2=4.15$, $df=1$, $p<0.05$) between farmers with wide or narrow span of knowledge and their overall pattern of adoption. Markedly higher percentage of farmers with wide span of knowledge are found in the full adoption category while markedly lower percentage of farmers with narrow span of knowledge are found in the full adoption group. Cell Chi-square values show that farmers with wide span of knowledge in the full adoption category contributed more than a half of the significant difference. This result indicates that farmers who have access to wide span of knowledge in various agricultural technologies tend to have higher adoption of technologies.

Table 7.15 Level of knowledge of farmers and overall pattern of adoption of farmers

Overall adoption pattern of farmers	Level of knowledge of farmers				Total	
	Wide span		Narrow span		n	%
	n	%	n	%		
Full adoption	3	6.8	0	0.0	3	2.9
Partial adoption	41	93.2	59	100.0	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0
Total	44	100.0	59	100.0	103	100.0

$\chi^2=4.15$, $df=1$, $p<0.05$

7.5 Relationship between some personal characteristics and overall adoption pattern of farmers

This is to find out whether certain characteristics of farmers have effect on their adoption behaviour. The characteristics are gender, age, educational background, source of farm labour, size of extra household labour, total farmland, land ownership and purpose of farming.

7.5.1 Relationship between gender of farmers and overall adoption pattern

Table 7.16 shows that there is no statistically significant relationship ($\chi^2=0.61$, $df=1$, $0.3 < p < 0.5$) between gender of farmers and overall adoption pattern. Markedly lower percentage of female farmers are found to fully adopt technologies. This suggests that differences in sex does not affect a farmer's decision to either adopt or reject a technology.

Table 7.16 Gender and overall adoption pattern of farmers

Overall adoption pattern of farmers	Gender of farmers				Total	
	Males		Females		n	%
	n	%	n	%		
Full adoption	3	3.5	0	0.0	3	2.9
Partial adoption	83	96.5	17	100.0	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0
Total	86	100.0	17	100.0	103	100.0

$\chi^2=0.61$, $df=1$, $0.3 < p < 0.5$ (NS)

7.5.2 Relationship between age of farmers and overall adoption pattern

Table 7.17 shows no significant relationship ($\chi^2=0.93$, $df=1$, $0.3 < p < 0.5$) between age of farmers and their overall adoption pattern. There was however markedly lower percentage of farmers from 50 years and above in the full adoption category. This suggest that age of farmers does not influence their decision either to adopt or reject innovations brought to them.

Table 7.17 Age and overall adoption pattern of farmers

Overall adoption pattern of farmers	Age of farmers(years)				Total	
	20-49		50 and above			
	n	%	n	%	n	%
Full adoption	3	3.8	0	0.0	3	2.9
Partial adoption	76	96.2	24	100.0	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0
Total	79	100.0	29	100.0	103	100.0

$\chi^2=0.93$, $df=1$ $0.3 < p < 0.5$ (NS)

7.5.3 Relationship between educational background of farmers and overall adoption pattern

Table 7.18 shows statistically significant relationship ($\chi^2=4.2$, $df=1$, $p < 0.05$) between educational background of farmers and their overall adoption pattern. Markedly lower percentages of farmers without or with lower education are found in the full adoption category whereas markedly higher percentage of farmers with high education are found in the full adoption category. This suggests that as the educational background of farmers increases, they tend to adopt technologies sent to them by the Front Line Staff.

Table 7.18 Educational background and overall adoption pattern of farmers

Overall adoption pattern of farmers	Educational background of farmers				Total	
	No/Low schooling		High education			
	n	%	n	%	n	%
Full adoption	1	1.2	2	10.0	3	2.9
Partial adoption	82	98.8	18	90.0	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0
Total	83	100.0	20	100.0	103	100.0

$\chi^2=4.2$, $df=1$, $p < 0.05$



7.5.4 Relationship between source of farm labour of farmers and their overall adoption pattern

Table 7.19 shows no statistically significant relationship ($\chi^2=0.5$, $df=2$, $0.7 < p < 0.8$) between source of farm labour of farmers and overall adoption pattern of farmers. This indicates that the kind of farm labour farmers' use does not influence adoption of farmers.

Table 7.19 Source of farm labour and overall adoption pattern of farmers

Overall adoption pattern of farmers	Source of farm labour						Total	
	Self/family/friend		Family/hired.		Family/hired /friend		n	%
	n	%	n	%	n	%		
Full adoption	0	0.0	2	3.7	1	2.9	3	2.9
Partial adoption	14	100.0	52	96.3	34	97.1	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0	0	0.0
Total	14	100.0	54	100.0	35	100.0	103	100.0

$\chi^2=0.5$, $df=2$, $0.7 < p < 0.8$ (NS)

7.5.5 Relationship between size of extra household labour and overall adoption pattern

Table 7.20 shows that there is no statistically significant relationship ($\chi^2=0.9$, $df=1$, $0.3 < p < 0.5$) between size of extra household labour available to farmers and their overall adoption pattern. This indicates that adoption of technologies by farmers does not depend on the number of extra household labour available to them.

Table 7.20 Size of household labour available and overall adoption pattern of farmers

Overall adoption of farmers	Size of household labour available to farmers				Total	
	0-3		4-12		n	%
	n	%	n	%		
Full adoption	1	1.6	2	5.0	3	2.9
Partial adoption	62	98.4	38	95.0	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0
Total	63	100.0	40	100.0	103	100.0

$$\chi^2=0.9, \quad df=1, \quad 0.3 < p < 0.5(\text{NS})$$

7.5.6 Relationship between total farmland available to farmers and their overall adoption pattern

Table 7.21 shows that there is statistically significant relationship ($\chi^2=32.1$, $df=2$, $p<0.05$) between total farmland available to farmers and their overall adoption pattern. Markedly higher percentage of farmers who have large acreage of land tend to fully adopt technologies brought to them whilst markedly lower percentage of farmers who have relatively small acreage of land adopted fully the technologies. However, markedly lower percentages of farmers with large acreage of farmland are found in the partial adoption category. Thus total farmland available to farmers affects the adoption behaviour of farmers.

Table 7.21 Total farmland available to farmers and overall adoption pattern

Overall adoption pattern of farmers	Total farmland available to farmers						Total	
	Rel. small		Rel. large.		Large		n	%
	n	%	n	%	n	%		
Full adoption	0	0.0	1	2.3	2	50.0	3	2.9
Partial adoption	55	100.0	43	97.7	2	50.0	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0	0	0.0
Total	55	100.0	44	100.0	4	100.0	103	100.0

$$\chi^2=32.1, \quad df=2, \quad p<0.05$$

7.5.7 Relationship between total land owned by farmers and overall adoption pattern

Table 7.22 shows that there is no statistically significant relationship ($\chi^2=2.4$, $df=1$, $0.1 < p < 0.2$) between total land owned by farmers and overall adoption pattern even though markedly lower percentage of tenant farmers are found in the full adoption category. This shows that adoption of technologies does not depend on whether a farmer owns the land or is a tenant.

Table 7.22 Land ownership and overall adoption pattern of farmers

Overall adoption pattern of farmers	Land ownership				Total	
	Land owners		Tenants		n	%
	n	%	n	%	n	%
Full adoption	3	5.3	0	0.0	3	2.9
Partial adoption	54	94.7	46	100.0	100	97.1
Non adoption	0	0.0	0	0.0	0	0.0
Total	57	100.0	46	100.0	103	100.0

$\chi^2=2.4$ $df=1$ $0.1 < p < 0.2$ (NS)

7.5.8 Relationship between purpose of farming and overall adoption pattern of farmers

Table 7.23 shows that there is statistically significant relationship ($\chi^2=9.8$, $df=2$, $p < 0.05$) between purpose of farming and overall adoption pattern of farmers. Markedly lower percentage of farmers who farm for subsistence purpose are found in the full and partial adoption categories. It was found that markedly higher percentage of farmers who farm for commercial purpose only are found in the full adoption category whilst markedly lower percentage of same are also found in the partial adoption category. The result indicates that because of the commercial gains expected as a result of the use of improved breeds/varieties of animals and crops, farmers who

go into farming for commercial purposes tend to adopt fully technologies delivered to them by the FLS.

Table 7.23 Purpose of farming and overall adoption pattern of farmers

Overall adoption pattern	Purpose of farming						Total	
	Subsistence		Commercial.		Subsistence/commercial		n	%
	n	%	n	%	n	%		
Full adoption	0	0.0	1	33.3	2	2.02	3	3.0
Partial adopt	1	100.0	2	66.7	97	97.98	100	97.0
Non adoption	0	0.0	0	0.0	0	0.0	0	0.0
Total	1	100.0	3	100.0	99	100.0	103	100.0

$\chi^2=9.8$, $df=2$, $p<0.05$

7.6 Summary

Partial adoption was the dominant pattern of behaviour as about 8 out of every 10 farmers partially adopted packages disseminated to them. There was no statistical significant relationship ($\chi^2=0.73$, $df=2$, $0.5<p<0.7$) between frequency of contact and their adoption behaviour. Farmers visited more frequently did not in any way fully or partially adopt technologies introduced to them. There was however statistically significant relationship ($\chi^2=4.63$, $df=1$, $p<0.05$) between number of extension methods used and adoption behaviour of farmers. Farmers who were contacted with more number of extension methods tended to fully adopt technologies disseminated to them. There was marginal statistically significant relationship ($\chi^2=2.81$, $df=1$, $0.1<p<0.05$) between farmers who work with FLS with wide or narrow span of knowledge and adoption pattern of farmers. There was also statistically significant relationship ($\chi^2=4.15$, $df=1$, $p<0.05$) between the level of knowledge of farmers and their overall adoption pattern. It was also found that age, sex, source of farm labour, source of household labour and land ownership have no significant effect on adoption

however educational background of farmers, total farmland available to farmers and purpose of farming have significant effect on adoption.

In conclusion, the level of knowledge of farmers had significant effect on the adoption behaviour of farmers, however the span of knowledge of FLS farmers work with, marginally affected the overall adoption behaviour. Whereas frequency of contact had no effect, the number of extension methods used by Front Line Staff significantly affected the adoption behaviour of farmers. This indicates that span of knowledge of FLS and the frequency of contact is not important in the adoption behaviour of farmers, however the number of extension methods used play important role in improving the adoption behaviour of farmers.



CHAPTER EIGHT

SUMMARY OF DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

8.0 Introduction

The effort to train Front Line extension workers of the Ministry of Food and Agriculture (MOFA) on the agricultural training needs of farmers, has been one of the ways to improve their performance. However the observed poor performance of the Front Line Staff raises questions as to whether the contents of the training provided to the extension workers affected their performance and if so which content is likely to enhance their performance.

The assumptions for this research is that farmers have needs and for extension workers to provide appropriate extension programmes to their farmers, they should also receive training which addresses farmers' needs. It is expected that when this happens, FLS are likely to provide extension programmes to farmers which are appropriate to their needs. The results obtained on the training needs of farmers, nature and content of training and span of knowledge of FLS, determinants of span of farmers knowledge, and performance of the FLS are discussed to find out whether they support the hypothesis which states that:

- i. training that different Front Line Staff have received address farmers needs for technical messages to different extent.
- ii. the content of programmes that extension workers give to farmers is positively related to the content of training FLS have received.

- iii. performance of the Front Line Staff as indicated by adoption level of their farmers is positively related to the extent that training they received address the extension needs of farmers.

8.1 Training Needs of Farmers

Farmers have needs which have to be identified through collaborative effort between the Front Line Staff of the Extension Services and farmers they work with. To determine whether farmers have needs which needed to be addressed, views of farmers on their needs were sought in all the twenty operational areas visited in the study area.

The training needs of the farmers from Suhum Kraboa-Coaltar and West Akim districts in the Eastern region of Ghana were identified for crops as (i) technical knowledge in the cultivation, storage and simple methods of processing of maize, cassava, plantain, vegetables, oil palm, citrus, cocoyam, pineapple, sugar-cane, rice, black pepper, groundnut, mango, (ii) the practice of agro-forestry i.e. the cultivation of teak and (iii) the need for farmers to have knowledge in the detection of disease in plants and how to use chemicals like weedicides on their farms.

In livestock, areas in which farmers needed training in included- the production of livestock, detection and treatment of diseases in sheep, goats, cattle, rabbits, ducks. Other enterprises in which farmers need information are production of snails, mushrooms, fish farming and bee-keeping. Atwood (1967) aptly summarizes some thought as to the importance of involving adult learners in identifying and analyzing

their own educational needs. The rationale for a sound diagnostic procedure in adult education seems to rest upon one basic question -that learning experiences for adults should be designed to meet what they perceive to be their real needs.

If one accepts this basic assumption, the importance of diagnostic procedure or a basis for planning becomes readily apparent. The procedure must be one that leads to collaborative identification of real educational needs by the public affected and the adult educator. Such collaborative effort between farmers and Front Line Staff to identify farmers needs was non-existent in the study area. A situation which can cause the farmers to see any programme brought to them as extension agent's programme and not theirs (Savile, 1978). This might lead to non acceptance of messages disseminated by FLS. Oladepo, Adeniyi, Parker & Foushee (1991) found in Nigeria that often training programmes in health education are planned for rather than with participants, and thereby may not meet the participants training needs. The work done by Brenes (1995) and Connors (1995) affirm the importance of assessing the needs of groups of people an organisation is to work with, as was the case of limited resource farmers of Camuy, Puerto Rico and Adult Educators of Dmitrov District-Russia respectively.

8.2 Training received by the Front Line Staff

The Front Line Staff has to improve upon his knowledge on constant changes in agricultural technologies, learn aspect of extension work not covered during the basic training and learn about new procedures, approaches, techniques and teaching aids in extension work through in-service training. The type of training the Front

Line Staff have received, shows that a higher percentage (72%) were classified as having wide span of knowledge and 28% have narrow span of knowledge. This high knowledge factor could be attributed to the fact that a greater percentage (92%) of the Front Line Staff have been attending monthly in-service training where new innovations are taught and farmers problems discussed. Front Line Staff who attended the monthly in-service training had wide span of knowledge. The reason is that it was only at the monthly in-service training where the FLS at least received training in most, if not all the training needs of farmers in the study area. This indicates that the in-service training organized served a good purpose and that if topics are introduced and treated appropriately at that level, it will help produce well trained and competent Front Line Staff who will be able to help farmers identify and solve their training needs even if they are unable to gain admission to the University.

Few (20%) of the Front Line Staff had the opportunity of attending higher institution i.e the University, where contents of their curricular was expected to cover most of the aspects of competencies required by them to perform their expected roles. The reasons might be that majority of the Front Line Staff do not have the necessary admission requirements to enable them enter the University. However the span of knowledge of FLS was not related to attendance of higher institution. The reason that could be assigned were that the FLS were trained in Crops, Animal Science, Agricultural Economics and Agricultural Extension which did not exhaust the training needs of farmers in the study area.

It was therefore expected that the local monthly in-service training sessions organized at the district level make up for the deficiency. Majority of the Front Line Staff (70%) indicated they have received training in crop production, livestock production and extension methods during the pre-service and in-service training. A look at the training topics for the FLS monthly in-service training from the Training Officer for 1995/96 and that enumerated by the Front Line Staff through interview, showed that greater emphasis was however placed on crop production (>60%) whilst majority (60%) of the Front Line Staff did not receive training in mushroom production, snail production and bee-keeping which formed part of the training needs of the farmers.

Even though more than 60% of the Front Line Staff indicated they received training in fish farming, women in agricultural development (WIAD) activities, agro-forestry practices and post harvest technology during the in-service training, it was observed that little emphasis was placed on them. On the contrary the study showed that much attention was given to training the Front Line Staff in crop production and little training in important topics like livestock production, fish farming, mushroom production and bee-keeping which form part of the training needs of the farmers in the study area.

Aspects of extension delivery i.e. extension methodology, programme planning, farm budgeting and participatory rural approach were also least taught during the in-service training. The disparity in the training of the Front Line Staff for the various technologies could be attributed to factors like the cost of inputs, availability of

inputs, and availability of Subject Matter Specialist. It could be seen that whilst inputs needed to train Front Line Staff on crop technology is low in cost, available and easy to handle, that for livestock, snail production, bee-keeping, fish farming and agro-forestry are expensive, not easily available and sometimes bulky to handle at training sessions. There are also more Subject Matter Specialists for crops than the other technologies. Because of these constraints, technologies other than crops are treated superficially during the in-service training sessions.

Attention was not put on developing the communication skills of the Front Line Staff. More than 60% of the Front Line Staff indicated they did not receive training on aspects of extension delivery i.e. adoption process, barriers to communication, non-verbal communication, channels of communication and characteristics of innovation. Other work by Geker et al. (1990) also affirms this result when they indicated that training will be required by field-level staff in practical skills and improved agricultural technology as well as in extension methods and communication skills. Furthermore the beneficiary assessment report on NAEP by MOFA (1997) indicated that inadequate training in management and extension communication skills results in slow diffusion of extension messages.

The result of this study disagrees with Gatere (1986/87) who indicated that attention should be paid to developing communication skills which at present are lacking. Furthermore it disagrees with both MacDonald & Hearle (1984) who wrote that for change agents to be effective in their work, they must combine their technical knowledge with communication skills, and Maunder (1973) who also indicated that



the ability to communicate determines to a very large degree the success or failure of an extension worker. The reasons that might be assigned to this situation is that some agricultural administrators have the notion that anybody who has knowledge in the technical subjects could impart it to farmers and so do not see the urgency in training Front Line Staff in extension skills. The other factor is the non availability of Subject Matter Specialists for agricultural extension. More extension specialists should be trained and assigned the responsibility of training the Front Line Staff on extension skills.

The span of knowledge of the Front Line Staff was not related to attendance of induction training. However because it gives insight into the mission, philosophy, rules and regulations of the organisation the FLS will be working with as well as the kind of job they are going to undertake, it is suggested that they are taken through it since it gives them the needed confidence. Insufficient budgetary allocation has always been attributed as cause of the non-conduct of induction training, however a look at the conduct of induction training in the Ministry could help solve the problem. Previous induction training sessions took the form of a nation wide trip for extension workers to familiarise themselves with some of the agricultural set-up in the country. A situation which really calls for huge sum of money. To be able to induct officers and at the same time cut down cost, induction training should be organised for officers in their respective regions or districts as the case is now.

There was statistically significant relationship ($\chi^2=4.09$, $df=1$, $p=0.042$) between span of knowledge of the Front Line Staff and number of years in an operational

area. Front Line Staff who have stayed in their operational area for longer period (>4 years) have wide knowledge. The reasons might be that the Front Line Staff have a fair view of the problems in the area which are sent to the monthly **training** sessions for discussions and solutions from the Subject Matter Specialists and other agricultural workers.

To summarise, emphasis have been put on training the Front Line Staff in crop production both at the pre-service and in-service training sessions. Higher in-service training also focused on Crop science and Animal science. The Front Line Staff received least training in agricultural enterprises like mushroom production, bee-keeping, fish farming and non-traditional farming enterprises which form part of the extension needs of farmers in the study area. FLS were giving least training in extension skills at all levels of their training. As a result of the type of training Front Line Staff have received, a greater percentage (72%) had wide span of knowledge and 28% had narrow span of knowledge of farmers training needs. The different levels of knowledge of the Front Line Staff in farmers needs indicates that different Front Line Staff will address farmers needs for technical messages to different extent.

8.3 Determinants of span of farmers' knowledge

A greater percentage of FLS have wide span of knowledge of agricultural activities that farmers are engaged in, and is expected that a greater percentage of farmers will have wide span of knowledge about their needs. However, on the contrary, majority of the farmers turned out to have narrow span of knowledge about the agricultural

activities they are engaged in. This indicates that farmers' span of knowledge in agricultural activities is not related to the span of knowledge of the Front Line Staff they work with. The reason that could be assigned to this, is that because the Front Line Staff were expected to train farmers on many needs, they were introduced to many topics during the monthly in-service training without going into detail. This increased the span of knowledge of the Front Line Staff, however because they did not have a firm grasp of the subject matter involved, they could also not effectively impart to farmers during their visits.

Other factors like the frequency of contact by the FLS significantly ($\chi^2=6.48, df=2, p<0.05$) affected the span of knowledge of farmers. Farmers who received frequent visits from the Front Line Staff had wide span of knowledge. The number of types of extension methods used had no significant effect on the span of knowledge of farmers. Farmers differ in the way they accept technologies and so as they are frequently visited by the FLS, farmers develop confidence in the FLS while the FLS also become experienced in handling farmers problems. The aggregate effect is that farmers accept messages from the FLS. Staudt (1975/76) found that no extension project can be successful if the extension worker has little contact with the prospective participant.

8.4 Performance of the Front Line Staff

The pattern of adoption of the technological packages by farmers showed that partial adoption was the dominant behaviour of farmers in the study area. This was as a result of the trend observed in the extent of training received by the Front Line Staff

in the technological packages: crop production > post harvest > livestock production > WIAD activities > agro-forestry > fish farming > non-traditional farming (Table 5.22). This led to a corresponding increase in adoption of technologies that the Front Line Staff received adequate training in, the order being: crop production > group formation > business planning > post harvest > livestock production > WIAD activities > agro-forestry > non-traditional farming > fish farming (Tables 7.10). This results agrees with work done by Mtunzi (1990) who found increase in performance of groups involved when the contents of their training needs formed the basis of their training.

The Front Line Staff have been trained very much in crop production both at the pre-service and the in-service periods compared to the other training needs enumerated by the farmers and so more farmers adopted technology on crop production. Other farmers training needs like mushroom production, snail production, mushroom production, bee-keeping, fish farming in which the Front Line Staff did not receive much training were not adopted well by farmers. The result agrees with the beneficiary assessment report on NAEP by MOFA (1997) which found evidence of adoption of basic messages of planting in rows, correct planting densities, improved seeds and planting materials, organic manuring and post harvest management of crops.

The span of knowledge of farmers significantly ($\chi^2=4.15$, $df=1$, $p<0.05$) affected the overall adoption pattern of farmers as they adopted technologies which Front Line Staff received adequate training in. This indicates that in those technologies, the FLS

had better understanding of the principles and practices involved and that gave them the much needed abilities to impart to farmers. The statistical significant relationship between attendance of in-service training and level of knowledge of the Front Line Staff suggests that the performance of the extension agent could be enhanced if they are given appropriate in-service training tuned towards the training needs of farmers.

There was also no statistical significant relationship ($\chi^2=0.7$, $df=2$, $0.5 < p < 0.7$) between frequency of contact and the overall adoption behaviour of farmers. There was however statistically significant relationship ($\chi^2=4.63$, $df=1$, $p < 0.05$) between number of extension methods used and farmers' overall adoption pattern. Farmers who were contacted by the Front Line Staff through three extension methods tended to adopt technologies. This result agrees with the theory which says that increasing the number of methods used on a group of people increases the number of people who change their practice (Ministry of Agriculture, 1955). Farmers who received frequent visits from the FLS were expected to have had higher adoption of technologies because of the continuous interaction between farmers and Front Line Staff as a result of the confidence they might have in the Front Line Staff. The result however shows otherwise. This shows that it takes more than just frequent visits to farmers in order to have them adopt technologies.

The Front Line Staff worked mostly with younger male farmers. The reason may be that a greater percentage of the Front Line Staff were males and so naturally visited male farmers. The other reason may be due to the culture of the study area where women, because of certain roles expected of them, allow their husbands to attend

almost all meetings and report to them. This is contrary to the notion that our farming population consisted of mostly the aged. The present study suggests that farmers are no more only farming for subsistence purpose but are conscious of its commercial significance. They see farming as a business and therefore have entered into it first to feed themselves and their families and then make a living out of it.

Other personal and socio-economic characteristics of farmers had effect on their adoption pattern. Educational status, total farmland available to farmers, and purpose of farming all had statistically significant effect on the overall adoption of the technologies delivered to the farmers. This result agrees with work done by other researchers who also found significant differences between some personal and socio-economic characteristics and adoption of certain innovations. Feder et al. (1982) found that farm size can have different effect on the rate of adoption depending on the characteristics of the technology and institutional setting. More specifically, the relationship of farm size to adoption depends on such factors as fixed adoption cost, risk preferences, human capital, credit constraints, labour requirements, tenure arrangements, etc.

Similarly, Weil (1970) found in Africa that the adopters of ox cultivation cropped larger areas and operated significantly larger farms than those using hand cultivation. Binswager (1978) also found strong positive relationship between farm size and adoption of tractor power in Asia. On the contrary, Ruttan (1977) found that neither farm size nor tenure has been a serious constraint to the adoption of High Yielding Varieties (HYVs) of grain, but while smaller farmers and tenants tended to lag

behind larger farmers in the early years following the introduction, these lags have typically disappeared within a few years. Evenson (1973) found that education plays a strong role in the determining rates of adoption of new technology in developing agriculture. Lockhead, Jamison and Lau (1980) supported this assertion by finding a significant relationship between education indicators and farm productivity. Hicks and Johnson (1974) found that higher rural labour supply leads to adoption of labour-intensive rice varieties in Taiwan.

It could therefore be derived from the above discussion that the span of knowledge of the Front Line Staff has no significant relationship on both the knowledge and adoption behaviour of farmers. By this, it could be concluded that if the training of the Front Line Staff is aimed only at increasing their span of knowledge of the agricultural technologies as it is the case in the Training and Visit (T&V) system, without going into detail, they cannot effectively address the needs of farmers and thus will lead to poor adoption of agricultural technologies. Thus the expectation for this research that farmers of FLS with wide span of knowledge will have wide level of knowledge and thus higher adoption of technologies did not hold.

8.5 Conclusion

This research on the effect of training on extension workers' performance was based on the assumptions that farmers have needs and for the extension workers to be able to provide appropriate training to farmers, they should be trained in those needs. This is likely to enhance extension workers' performance. From the study, the areas that farmers needed information and skills in are (i) crop production, (ii) livestock



production (iii) non-traditional farming which include bee-keeping, mushroom production, snail production (iv) fish farming and (v) farm management skills.

The Front Line Staff is expected to be trained in these needs of farmers. However the training of the Front Line Staff at the pre-service focused mainly on crops, livestock and extension methods. Further school education, especially at the University level, also trained Front Line Staff on agricultural extension, crops, livestock, agricultural economics, mechanisation and home management. Since few of the Front Line Staff had the opportunity to enter university, the only alternative was the local monthly in-service training. The in-service training which was supposed to make up the differences also focused on crop production to the neglect of other needs of farmers. Induction training however received least attention.

Based on the extent of matching between the contents and methods of extension messages needed by farmers and the training provided to the Front Line Staff, 72% of the Front Line Staff have had training in a wider range of information needs of farmers, whilst 28% have narrow level of knowledge. It was also found that 74.2% of the farmers worked with Front Line Staff with wider span of knowledge of farmers needs whilst 25.8% worked with Front Line Staff with narrow span of knowledge of farmers information needs. There was no significant difference between the overall adoption pattern of farmers of Front Line Staff with wide or narrow span of knowledge of farmers information needs. Significant difference was observed in the overall adoption pattern of technologies for farmers with wide and

narrow range of knowledge. Farmers with wide knowledge adopted technologies more than farmers with narrow range of knowledge.

Figure 8.1 shows the relationship between span of knowledge of FLS in farmers' needs, extension contact (i.e. frequency and number of methods used), and personal and socio-economic characteristics of farmers on adoption. The figure shows that the span of knowledge (wide or narrow) of Front Line Staff has no significant effect on how frequent they visit farmers as well as the number of extension methods they use to disseminate messages to farmers. There was however marginal significant difference between the span of knowledge of FLS and adoption behaviour of farmers. It again shows that farmers who were frequently visited by FLS did not adopt more technologies, however those who had three different extension methods used on them adopted more of the technologies. Finally it shows that certain personal and socio-economic characteristics i.e. educational background, size of land, and purpose of farming should be considered when dealing with farmers on innovations since they affect adoption behaviour.

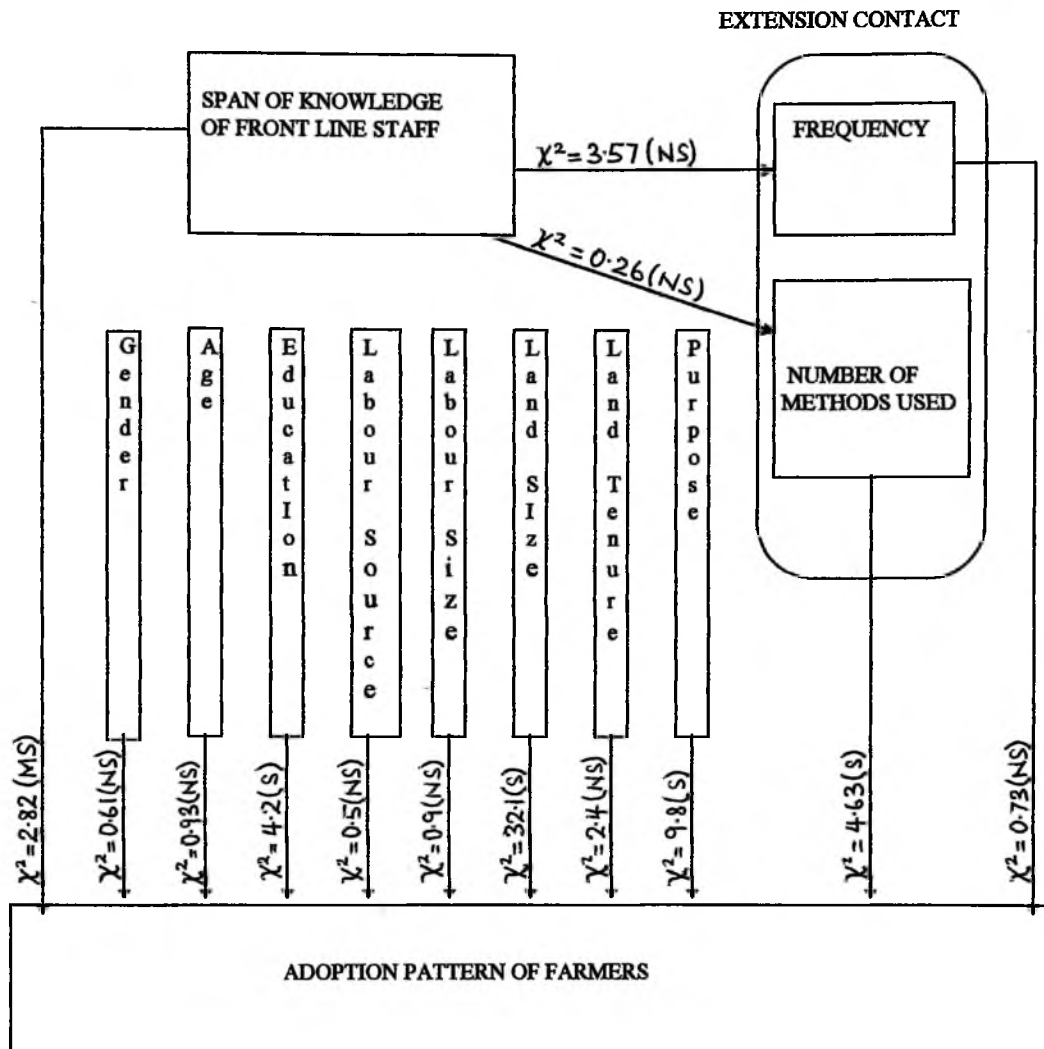


FIGURE 8.1 Relationship between span of knowledge of FLS in farmers' extension needs, extension contact and personal characteristics of farmers on the adoption pattern of farmers

The study also showed that certain personal and socio-economic characteristics however affected the level of knowledge and adoption behaviour of Front Line Staff and farmers respectively. Whilst attendance of in-service training and number of years spent in an operational area had significant effect on the level of knowledge of Front Line Staff, gender, educational background, total farmland available, and purpose of farming had significant effect on the overall adoption pattern of farmers.

To summarize, the study shows that there was marginal significant relationship between span of knowledge of FLS and adoption pattern of farmers. However other factors like number of extension methods used to disseminate information to farmers and some personal characteristics of farmers also play key role in enhancing the adoption behaviour of farmers. This suggests that in addition to the technical subjects, Front Line Staff should be trained very well in aspect of extension delivery. Since there was higher adoption of technologies that the Front Line Staff received adequate training in, it could be concluded that training extension workers into detail on the contents of farmers needs positively affected their performance.

8.6 Recommendations

Based upon the purpose and objectives of the study and data analysis, the following recommendations are made.

Policy recommendation

The provision of training based on farmers needs was likely expected to enhance the performance of the Front Line Staff. The result of this study shows that there was

only a marginal significant difference in the adoption behaviour of farmers of the two categories of FLS (i.e. wide and narrow span of knowledge), rather farmers adopted technologies in which FLS received adequate training. It is recommended that the Front Line Staff are given in-depth training on the topics treated during the monthly in-service training sessions. The training should include enterprises like livestock production, snail production, mushroom production, bee-keeping and fish farming. They should also be trained in aspects of extension delivery which include extension methodology and communication skills, and programme planning. This will enable them to properly identify farmers needs and help them to effectively disseminate technical messages on farmers needs.

Research recommendation

The Front Line Staff are trained on technological needs of farmers to enable them also train farmers. But since the study showed that other factors affected the kind of messages that got the farmers, it will be appropriate to conduct research to determine whether the messages given by the Front Line Staff to farmers are the same as what they receive during training since differences in the two could likely affect the adoption behaviour of farmers. Further research should also be conducted to determine the extent to which the content of training of the Front Line Staff during the monthly training sessions should go that will likely enhance their performance.

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PERSONAL COMMUNICATION

1. Sakyi-Dawson, O.(1997). Lecturer. Department of Agricultural Extension, University of Ghana, Legon



APPENDIX 1

INTERVIEW CHECKLISTS FOR DETERMINING FARMERS'NEEDS

1. What types of crops and animals are grown and reared respectively in your area. Rank them according to their order of importance?
2. Let us draw a calendar of seasons and farming activities undertaken for each crop or livestock in this area.
3. On which crops and livestock do you need technical messages from the extension officer?'
4. Which method(s) and channel(s) of communication do you prefer to be used by the extension officer to present messages to you? Rank them according to the order of preference.
5. For the extension officer to clarify his messages to farmers, what teaching aids/methods do you prefer he uses?
6. What other activities/messages apart from the above you think if given by the extension officer will have a positive effect on your farming activities?
7. Have you ever had an opportunity through a forum to discuss your needs with the extension officer?

APPENDIX 2

THE EFFECT OF TRAINING ON EXTENSION WORKERS' PERFORMANCE

**AGRICULTURAL EXTENSION DEPARTMENT
UNIVERSITY OF GHANA**

SURVEY INTERVIEW QUESTIONNAIRE FOR FARMERS

1. This survey is being conducted in an attempt to assess the effect of training on job performance of the Front Line Staff (FLS). The areas covered are as follows:

Part A--- Personal and socio-economic characteristics of respondents

Part B--- Performance of the Front Line Staff.
2. The information you provide in this questionnaire will be held in confidence.
3. Thank you for your co-operation.

J.Nketia Gyenfie

PERSONAL AND SOCIO-ECONOMIC CHARACTERISTICS

0. Questionnaire Number.....
1. District.....
2. Village.....
3. Name of farmer.....
4. Sex: 1.M [] 2.F []
5. Age(yrs) 1. 15-19 []
 2. 20-29 []
 3. 30-39 []
 4. 40-49 []
 5. 50 and above []
6. Educational background
 0. No schooling []
 1. M.S.L.C./J.S.S []
 2. O'Level/S.S.S []
 3. A'Level []
 4. University []
 5. Other(specify).....
7. Source of farm labour?
 1. Family []
 2. Hired []
 4. Reciprocal(Nnoboa) []
 8. Other(specify).....
8. Number of members of household available to provide labour to you?.....
9. What is the total farm land available to you for farming?.....
10. What size of the total land available to you is owned by you?.....
11. What size of the total land available to you is hired by you?.....
12. How long have you been farming?
 1. 1-4yrs []
 2. 5-9yrs []
 3. 10-14yrs []
 4. 15-19yrs []
 5. 20yrs Above []
13. Purpose of farming?
 0. Cannot tell []
 1. Subsistence []
 2. Commercial []
 3. Both subsistence and Commercial []
 4. Other(specify).....

PERFORMANCE OF FRONT LINE STAFF**A. FARMERS' ACCESS TO EXTENSION EDUCATION**

14 What is the frequency of contact?

1. Daily []
2. Weekly []
3. Fortnightly []
4. Monthly []
5. Bi-monthly []
6. Cannot Tell []
7. Other(specify).....

B. OUTCOME OF THE INTERACTION BETWEEN FARMER AND EXTENSION WORKER

Indicate by ticking [] YES or NO from the table below the activities in which you have received adequate messages on from the front-line staff to enable you practice it.

MESSAGES	YES	NO
15. Row planting/spacing		
16. Use of hybrid varieties of plant		
17. Applying fertilizer to crops		
18. Good nursery practices		
19. Application of insecticide/fungicide		
20. Timely harvesting		
21. Timely weeding		
22. Chemical treatment of maize		
23. Storing treated maize in narrow crib		
24. Construction of narrow crib		
25. Use of improved breeds of animals		
26. Proper housing of farm animals		
27. Proper feeding of farm animals		
28. Dry season feeding of farm animals with hay/silage		
29. Proper watering of farm animals		
30. Good sanitation in pens of farm animals		
31. Agroforestry practices		
32. Fish farming		
33. Preparation of Soya milk		
34. Addition of soybean to dishes		
35. Construction of smokeless stove		
36. Simple methods of preserving vegetables		
37. Formation of farmer groups		
38. Planning of farming activities		
39. Farm record keeping		
40. Snail production		
41. Mushroom production		
42. Yam Minisett Technology		
43. Plantain Minisett Technology		
44. Beekeeping		

C. PROCESS OF DELIVERY OR EXTENSION METHODS USEDIndicate by ticking / how the Front Line Staff reaches you with technical messages.

PROCESS/TYPE	TICK
45. INDIVIDUAL METHOD	
1. Farm Visit	
2. Home Visit	
4. None above	
46. GROUP METHOD	
1. Method demonstration	
2. Result demonstration	
4. Field trips/tours	
8. Farmer Meeting	
16. None above	
47. MASS METHOD	
1. Radio	
2. Posters	
4. None above	
48. TEACHING AIDS	
1. Blackboard	
2. Photograph	
4. Flip Chart	
8. Real object	
16. None above	

D. RESULT OF ACCESS

How have you responded to the messages given to you through your interaction with the Front Line Staff ?

MESSAGES	<u>ADOPTED</u>		Reasons for adoption	Reasons for non-adoption
	Y	N		
49. Row planting/spacing				
50. Use of hybrid varieties of plant				
51. Applying fertilizer to crops				
52. Good nursery practices				
53. Application of insecticide/fungicide				
54. Timely harvesting				
55. Timely weeding				
56. Chemical treatment of maize				
57. Storing treated maize in narrow crib				
58. Construction of narrow crib				
59. Use of improved breeds of animals				
60. Proper housing of farm animals				
61. Proper feeding of farm animals				
62. Dry season feeding of farm animals with hay/silage				

63. Proper watering of farm animals				
64. Good sanitation in pens of farm animals				
65. Agroforestry practices				
66. Fish farming				
67. Preparation of Soya milk				
68. Addition of soybean to dishes				
69. Construction of smokeless stove				
70 Simple methods of preserving vegetables				
71. Formation of farmer groups				
72. Planning of farming activities				
73. Farm record keeping				
74. Snail production				
75. Mushroom production				
76. Yam Minisett Technology				
77. Plantain Minisett Technology				



APPENDIX 3**THE EFFECT OF TRAINING ON EXTENSION WORKERS' PERFORMANCE****AGRICULTURAL EXTENSION DEPARTMENT
UNIVERSITY OF GHANA****SURVEY INTERVIEW QUESTIONNAIRE FOR THE FRONT LINE STAFF**

1. This survey is being conducted in an attempt to assess the effect of training on job performance of the Front Line Staff. The areas to be covered are as follows:
Part A--- Personal characteristics of the Front Line Staff
Part B--- Training Front Line Staff has received
2. The information you provide in this booklet will be held in confidence
3. Thank you for your co-operation.

J. Nketia Gyenfie

PERSONAL CHARACTERISTICS

0. Questionnaire Number.....
1. District.....
2. Operational Area.....
3. Age(yrs) 1. 15-19 []
 2. 20-29 []
 3. 30-39 []
 4. 40-49 []
 5. 50-59 []
4. Gender: 1 Male [] 2.Female []
5. Marital Status
 1. Married []
 2. Single []
 3. Divorced []
 4. Separated []
 5. Widowed []
 6. Other(specify).....
6. Agricultural College attended.....
7. Year of completion.....
8. How long have you been in your operational area?
 1. 1-2yrs []
 2. 2yrs []
 3. 3yrs []
 4. 4yrs []
 5. 5yrs above []
9. How long have you worked with the Dept. of Agricultural Ext Services.?
 1. Less than 1yr []
 2. 1yr- 4yrs []
 3. 5yrs- 9yrs []
 4. 10yrs-14yrs []
 5. 15yrs above []
10. How many years have you worked as a Front Line Staff?
 1. Less than 1yr []
 2. 1yr- 4yrs []
 3. 5yrs- 9yrs []
 4. 10yrs-14yrs []
 5. 15yrs above []

TRAINING PROVIDED TO THE FRONT LINE STAFF

Indicate by ticking [] the subject areas you have received training to enable you perform your job and show the source of the training. Where not applicable, indicate with N/A.

	SUBJECT AREAS	TICK	PRE-SERVICE	IN-SERVICE
11.	Crop production			
12.	Livestock production			
13.	Poultry production			
14.	Fish farming			
15.	Agro-forestry			
16.	Home management(WIAD)			
17.	Post harvest management			
18.	Communication principles			
19.	Adoption process			
20.	Non verbal communication			
21.	Barriers to communication			
22.	Characteristics of innovation			
23.	Channels of communication			
24.	Extension teaching methods			
25.	Use of teaching aids			
26.	Mushroom production			
27.	Beekeeping			
28.	Snail production			
29.	Programme planning			

30. Were you given induction training when first employed?

1. Yes [] 2. No []

31. What were the contents of the induction training

.....

32. Is induction training important? Give reasons

.....

33. Have you attended a higher institution apart from the agricultural college, if so indicate the type of institution

0. None []

1. Polytechnic []

2. Specialist []

4. University []

8. Other(specify).....

34. List the content of the above course?

COURSE	CONTENT
1.	
2.	
4.	
8.	

35. Have you been attending in-service training during the past two years?

1. Yes [] 2. No. []

36. If yes, list the topics you have treated

1995	1996

37. If no, why?.....

38. Is the in-service training adequate? if yes, give reasons.....

39. If not adequate, give reasons.....

40. If not adequate, which areas do you more training? Give details of this.

41. In your opinion, at what stage of the training of the Front Line Staff should the areas you have identified be incorporated. Tick whichever is applicable.

- 1. Agricultural College []
- 2. Induction training []
- 4. In-service training []
- 8. Cannot tell []
- 16 Other(specify).....