UNIVERSITY OF CAPE COAST

FARMERS' PERCEPTIONS OF NGO INTERVENTIONS ON AGRICULTURE IN MFANTSIMAN AND KOMENDA-EDINA-EGUAFO-ABREM MUNICIPALITIES OF THE CENTRAL REGION OF GHANA

BY

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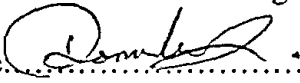
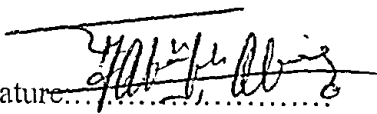OCTOBER 2008

DECLARATION

Candidate's Declaration

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

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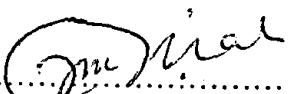
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Supervisors' Declaration

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

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ABSTRACT

Agricultural production by farmers continues to face many challenges. NGOs play an important role by assisting farmers to improve on their production levels and livelihoods. The study was carried out using a descriptive-correlational survey design to examine farmers' perceptions of the effects of NGO interventions on agriculture in Mfantsiman and KEEA municipalities in the Central Region of Ghana. Four NGOs provided services to the farmers.

The results showed that most of the farmers were at least 40 years old, literate, engaged in crop production and cultivated 2 – 5ha of land and had at least 10 years of farming experience. The study showed that the interventions of NGOs improved the level of agriculture. NGO activities also produced significant improvement in the yield, income, quality of produce, food security, weed control, use of fertilizer/manure, land preparation, housing of animals, disease and pest control, storage and preservation, processing and marketing. Generally, farmers' livelihoods comprising their ability to afford school fees, health, good clothing, decent house and more food were enhanced. The farmers in Mfantsiman Municipality perceived the effects of the interventions to be 'good' while those in KEEA Municipality perceived it to be 'very good'. Both male and female farmers perceived the effects of the interventions to be 'good'. The working relationship between farmers and NGOs were perceived to be 'very good'. The study recommends that: 1) NGOs should give farmers adequate credit support. 2) Inputs should be made available and affordable by the government, relevant agencies and NGOs.

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DEDICATION

To my wife, Juliana Buadi and my children, Dela, Worla, Kafui and Edem.

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LIST OF ACRONYMS

ADP	Area Development Programme
ADRA	Adventist Development and Relief Agency
AEA	Agricultural Extension Agent
AEO	Agricultural Extension Officer
ASAWA	Association for the Advancement of Women in Africa
CARE	Co-operatives for Assistance and Relief Everywhere
CBO	Community-Based Organisations
CEWEFIA	Central and Western Fishsmokers Association
CIMMYT	International Maize and Wheat Improvement Centre
COWAN	Country Women Association of Nigeria
CRS	Catholic Relief Services
DAES	Directorate of Agricultural Extension Services
DDO	District Development Officer
FAO	Food and Agriculture Organisation of the United Nations.
HYV	High Yielding Variety
IEA	Institute of Economic Affairs
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
IRRI	International Rice Research Institute
KEEA	Komenda-Edina-Eguafo-Abrem
MoFA	Ministry of Food and Agriculture
M & E	Monitoring and Evaluation
NGO	Non-Governmental Organisation
OECD	Organization for Economic Co-operation and Development
RS	Rio Grande do Sul

SPSS	Statistical Product and Service Solutions
T&V	Training and Visits
UCC	University of Cape Coast
UN	United Nations
VEW	Village Extension Worker
WVI	World Vision International

CHAPTER ONE

INTRODUCTION

Background to the study

The economy of West African countries depends basically on agriculture, which, together with forestry and fisheries, constitutes the primary production sector of the economy (Akinsanmi, 1999). Beside the production o. food for the growing population of Ghana, the sector accounted for 39.3 percent of the Gross Domestic Product in 2006 (IEA, 2007). MoFA (2002) sums up the contribution of various sub-sectors to agricultural GDP: Crops – 64% and this included roots and tubers, plantain, cereals and other crops; cocoa – 13 percent, forestry-11 percent, livestock / poultry – 7 percent and fisheries – 5 percent.

Despite the huge contributions of agriculture to the economy, there are still great challenges to meet the food, fibre and fuel needs of the growing population. The levels of crop and animal productivity in most developing countries remain well below the levels that are potentially feasible (Ruttan, 1991). According to Srivastava (1991), the current rate of growth in food production would be outpaced by higher growth rates, increasing use of grains for meat, dairy products, and industrial purposes, and relatively high elasticities of expenditure for food in developing countries. Ruttan (1991) indicated that food demand would double in many places before the end of

2020, due to growth in population and income. Post-production food losses that occur in storage, processing and marketing of farmers' produce pose a significant threat to food security. Colecraft (1993) pointed out that food security is a major area of concern in Africa today. Various factors impose serious constraints on the ability to attain food security. Some of the factors are droughts and other natural disasters, the seasonal and perishable nature of many crops, climatic conditions that promote food spoilage and inefficient food distribution methods. These factors affect year-round availability of food and the ability of communities of households to acquire food at all times.

According to Owusu-Sekyere (1997), the lack of a ready market is a major constraint to farmers all over Ghana. This has over the years affected the economic status of the hardworking farmers and their morale. It has also rendered farming less lucrative. More and more people are running away from undertaking farming out of frustration, while the youth have refused to go into farming even though the government is making effort to encourage them to take to farming. For agriculture to play the desired role that would ensure food security for the country, the provision of marketing avenues for farmers should be taken as a crucial issue which the authorities must address.

In the agricultural sector, governments of developing countries have, for years, dominated and monopolized the marketing and extension systems, credit, research and infrastructure. In spite of government efforts, a lot still remains to be done. There is therefore an urgent need for public and private interventions in agriculture. The interventions must not only seek to increase yields and productivity but also to reduce post-production losses and create sustainable rural livelihoods.

Srivastava (1991: 79) noted that to meet the production goals for the 21st Century we require technologies that:

- increase yields through better management, including better services to the farmer, more efficient use of inputs and natural resources, and reduced production costs;

- reduce losses from diseases, insects, weeds, rodents, and birds through integrated pest management and improved post-production technologies, including processing and marketing;

- seek genetic improvement through all methods available (including conventional breeding, hybrid technology, and biotechnology).

Under Ghana's Vision 2020, Ghana is to be transformed from the current low-income level to a prosperous middle-income level by the year 2020. MoFA's goal in this vision is to increase the agricultural sector annual growth rate from the current 2 percent to 3 percent during the period 1990 to 1996 and to 6 percent by the year 2020. To achieve this laudable target, the Directorate of Agricultural Extension Services (DAES) is expected to increase the number of farmers using approved and appropriate technologies from the current 15 percent to 50 percent by the year 2020.

The achievement of the above target would require government interventions in agriculture, through MoFA and the extension services. Various governments in Ghana have used different interventions, such as Operation Feed Yourself, subsidies, provision of credit, and guaranteed prices, with varying levels of success.

Considering declining public resources, some national governments have welcomed the opportunity to shift some extension responsibilities to NGOs

(Swanson & Sammy, 2000). According to Ba (1995), most intermediary NGOs came into being between 1970 and 1985. Repeated droughts and other problems in Africa compelled the majority of western NGOs, to change their role of being suppliers of food to food producers. Sommer noted that, upon recognizing the limitations of relief and welfare approaches as a developmental strategy, in the late 1970s, many NGOs undertook projects in areas, such as preventive health, improved farming practices, local infrastructure, and other community development activities (as cited in Korten, 1987, p.148).

In Ghana, NGOs became very prominent after the 1983 drought. Adventist Development and Relief Agency (ADRA) and Catholic Relief Services (CRS) began to undertake relief services. Later, the NGOs embarked on empowering farmers through the provision of extension services. Today, there are many NGOs in Ghana that are intervening in agriculture in different areas. Some are in agro-forestry, zero tillage, inputs supply, agro-processing, crop production, grasscutter production, bee production and fisheries. Some of the NGOs have their own field staff (e.g. ADRA); others depend on MoFA extension workers. The agricultural activities carried out by beneficiary farmers can be categorized as production activities and output activities. Production activities include labour (work activities and management /decision-making activities). Output activities include storage, processing, transportation and marketing.

NGOs expect to contribute to the solution of the food problem by intervening in these activities. Byrnes (1978) indicated that the key requirements in solving the food problem consist of inputs, such as fertilizers,

pesticides, weed control measures, and proper timing of planting and other management practices. When these activities are effectively combined, the farmer can dramatically increase his/her yields or productivity per unit of land. Post-production activities, such as storage and preservation, processing and marketing, are also important in ensuring food security.

Donors' interest in NGO interventions is on the upsurge. According to Musgrove (1996), NGOs tend to be managed more efficiently than public extension systems and have lower operational costs. Frantz (1987) also observed that NGOs are more efficient than government in dealing with localized questions of development. Furthermore, they are capable of quicker and more objective action than agencies of the government because their administrative structures are less cumbersome and their character is more militant. Obviously, the interventions by NGOs are intended to impact positively on the efficiency, productivity, income and livelihood of the farmers.

Farmers' actions are normally directed and influenced by their perceptions. Perception guides their behaviour because what they perceive determines what they do after that (Gibson, 1969). Thus, the way farmers perceive NGO interventions influence the way they would use the advice of the NGOs. Perception is the main process by which humans obtain knowledge about the world. Knowledge about NGO interventions helps people to modify behaviour to match their beliefs and feelings (Wortman, Loftus & Marshall, 1992). Our attitudes, expectations, knowledge, beliefs, values and norms influence perception. An individual can develop a favourable or unfavourable attitude toward NGO intervention.

Statement of the problem

The bulk of foodstuffs in West Africa is produced by peasant farmers who have farms averaging two to three acres with very little capital inputs and using traditional methods. The scale of operations on the farms is limited due to the traditional ways of farming and lack of capital inputs. Most of the farmers have inadequate capital and technical knowledge for scientific farming, placing a limit on the expansion and development of their farms (Baffour, 1981). He also attributed the low yields over the years to the use of unimproved seeds and breeds of animals, storage and processing problems.

NGO interventions in agriculture in Ghana are intended to supplement government efforts since the coverage of the public extension service is low. As noted in Ghana's Vision 2020 document, only 15 percent of farmers are currently using improved and appropriate technologies. The Directorate of Agricultural Extension Services (DAES) is expected to increase the number of farmers using improved and appropriate technologies to 50 percent by the year 2020 (Albert, Braun, Donkoh, Loss & Schill, 1999).

MoFAs attempt to solve the problems of farmers has yielded some results. However, the low extension-farmer ratio, inadequate financial and logistical support and the poor roads to the rural areas have hindered MoFA from achieving its target. NGOs have come in to complement the efforts of the government. Funding for NGOs in agriculture is getting increasing attention. For over 30 years that NGOs have supplemented government effort in agricultural development, many farmers are still not reached by extension. Consequently, they are unaware of vital information concerning new developments that can help improve production; they are unaware of new

techniques of farming and improved methods of storage, processing and marketing and, hence, non-adoption of new technologies. Appropriate education and training programmes that can give the theoretical knowledge and practical and managerial skills to farmers are unavailable to the majority of farmers. Even farmers who have had extension contact may not get the desired results on their farms because of the extension approach used.

The public perceive extension delivery to be poor. Sometimes farmers complain, criticise and air their misgivings about the delivery of extension in their area (Dankwa, 2002). In his survey in the Central Region, Marshall (2004) found that NGO intervention did not significantly affect farmers perception about the effectiveness of agricultural extension services. People's perceptions about a programme are important in adoption and sustainability of a programme or a technology in a social system (Rogers, 1983). Their perceptions about a programme may be either positive or negative depending on factors like attitude, knowledge, expectation, values, social situation, among others. Cohen and Sebstad (1999) noted the importance of methods that emphasise client perspectives on impact assessment processes. They argued that programmes could only be successful to the extent that they provide services that can help clients achieve their goals.

The study of the effects of NGO interventions on agricultural activities in the Mfantsiman and KEEA municipalities of the Central Region, therefore, seeks to answer the following questions:

- Have NGO interventions on agriculture had positive effects on farmers?

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- Are farmers receiving the type of extension services they need from NGOs?

- How do NGO interventions influence the activities of farmers?

- Are farmers actually practising what NGOs communicate to them?

- What are the factors that hinder NGOs from achieving the desired results?

Objectives of the study

The general objective of this study is to examine farmers' perceptions of NGO interventions on agriculture in the Mfantsiman and KEEA municipalities of the Central Region, Ghana.

The specific objectives of the study are to:

1. Identify NGOs that are providing agricultural extension services to farmers in the Mfantsiman and KEEA municipalities of the Central Region.

2. Describe the demographic and farm-related characteristics of farmers participating in NGO extension programmes in terms of:

- Sex

- Age

- Social Status/position

- Level of education

- Farming experience

- Agricultural enterprises

- Farm size

3. Determine the mode of operation of NGOs in terms of:

- Mode of selection of clients

- Provision of Credit

- Input supply

- Training

- Technology transfer

- Agricultural information support

- Monitoring and evaluation

4. Examine the perceived extent to which NGO interventions have affected agriculture in terms of:

- Yield

- Income

- Quality of produce

- Food security

- Land preparation

- Weed control

- Use of fertilizers/manures

- Housing of animals

- Feeding of animals

- Disease and pest control

- Storage and preservation

- Processing

- Marketing

5. Examine the perceived effect of NGO interventions on livelihood of farmers with respect to:

- ability to pay school fees

- ability to pay for family's health.

- ability to provide good clothing.

- ability to provide the family with more food.

- ability to provide decent housing.

6. Examine the relationship between the perceived effects of NGOs intervention and:

- Level of education

- Farming experience

- Size of crop enterprise

- Adequacy of credit

- Adequacy of input

- Adequacy of training

- Adequacy of technology transfer

- Adequacy of information support

7. Compare the perceptions of farmers in the Mfantsiman and KEEA municipalities on all the performance variables in the study.

8. Compare the perceptions of male and female farmers about NGO interventions on agriculture.

9. Examine the working relationship between farmers and NGOs.

Research questions

1. Which NGOs are providing agricultural extension services to farmers in the Mfantsiman and KEEA municipalities of the Central Region?

2. What are the demographic and farm-related characteristics of farmers participating in NGO extension programmes in the Mfantsiman and

KEEA municipalities?

3. How do NGOs operate in the Mfantsiman and KEEA municipalities of the Central Region?

4. To what extent have NGO interventions affected agriculture in the Mfantsiman and KEEA municipalities?

5. What are the perceived effects of NGO interventions on the livelihood of farmers?

6. What is the relationship between the variables in the study such as level of education, farming experience?

7. What are the levels of perception of farmers in the two municipalities on all the performance variables in the study?

8. What are the levels of perception of male and female farmers about NGO intervention on agricultural activities?

9. How do farmers perceive their working relationship with NGOs?

Research variables

The variables to be examined for the study are characteristics of farmers, such as gender, age, social status/position, level of education, farming experience, agricultural enterprise and farm size. The variables under service provider (NGO) include provision of credit, input supply, training, technology transfer and agricultural information support.

Hypotheses

1. H_o: There is no significant relationship between the level of education of clients and the perceived effect of NGO interventions.

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H_1: There is a significant relationship between the level of education of clients and the perceived effect of NGO interventions.

2. H_o: There is no significant relationship between the farming experience of clients and the perceived effect of NGO interventions.

   H_1: There is a significant relationship between the farming experience of clients and the perceived effect of NGO interventions.

3. H_o: There is no significant relationship between the sex of clients and the perceived effect of NGO interventions.

   H_1: There is a significant relationship between the sex of clients and the perceived effect of NGO interventions.

4. H_o: There is no significant relationship between the age of clients and the perceived effect of NGO interventions.

   H_1: There is a significant relationship between the age of clients and the perceived effect of NGO interventions.

5. H_o: There is no significant relationship between the social status of clients and the perceived effect of NGO interventions.

   H_1: There is a significant relationship between the social status of clients and the perceived effect of NGO interventions.

6. H_o: There is no significant relationship between the type of enterprise of clients and the perceived effect of NGO interventions.

   H_1: There is a significant relationship between the type of enterprise of clients and the perceived effect of NGO interventions.

7. H_o: There is no significant difference in the perception of clients in the two municipalities on the variables in the study.

   H_1: There is a significant difference in the perception of clients in the two municipalities on the variables in the study.

8. H_o: There is no significant difference between male and female farmers' perceptions of NGO interventions on agriculture.

   H_1: There is a significant difference between male and female farmers' perception of NGO interventions on agriculture.

Justification of the study

With many farmers still producing at subsistence level, using traditional tools and methods, productivity is expected to be low. The focus of the NGOs is on food security, improved livelihood and poverty reduction.

According to Farrington (1997), donors have now begun to call for more NGOs involvement in programmes and have backed it up with direct funding. It is, therefore, important to examine clients' perceptions of the effects of NGO interventions on agriculture. The findings would aid planners, managers of NGOs and policy makers in understanding the perspectives of farmers and improving the design of their programmes. Improved planning in agriculture may lead to increased effectiveness of extension agents in working with the farming community. Furthermore, the findings will help equip the agents with necessary skills and give them insight unto strategies to use in communicating innovations to the clients. The findings could also shed light on the direction training programmes should take so as to get the desired results. One important contribution of this study is that the findings will highlight the kind

of working relationship that exists between NGOs and the clients and how this can be improved.

Limitations of the study

The study was limited to two municipalities in the Central Region due to time and financial constraints. The data provided by farmers were based on memory recall and this was a major limitation to the study. The ability to recall often varied with farmers and there was the possibility of farmers giving inaccurate responses to some items. The study was also limited by individual perceptions and interpretations of items.

Definition of terms

1. **Non-Governmental Organizations (NGO):**

   NGOs are independent, non-partisan, non-profit making, voluntary organizations that do not fall within the public and private commercial sectors.

2. **Post-production losses:** This means changes that occur during the post-production period in the availability, edibility, wholesomeness or quality of the commodity that prevents it from being utilized by the consumers.

3. **Perception:** Personal inclinations to disregard some things, emphasise others and put meaning together in one's own way.

4. **Client:** Beneficiary of agricultural extension services. In this study, client, clientele and farmer have the same meaning.

5. **Farmers:** It includes both producers/processors of crops/animals and fishsmokers/fishmongers.

6. **Livelihood:** Ability to provide the basic necessities of life, such as food, clothing, shelter, security, freedom, basic literacy and health care activities required for a means of living.

7. **Agricultural activities:** These refer to practices carried out in the production of crops and animals such as land preparation, weed control, fertilizer application, feeding of animals, pest control, disease control, medication, storage and preservation, processing and marketing.

8. **Food security:** This generally means a state of affairs where all people at all times have access to safe and nutritious food to maintain a healthy and active life. It is free of the risks of malnutrition or starvation.

Organisation of the thesis

From the introduction the study was organized into the following chapters: literature review, methodology, results and discussion and summary, conclusions and recommendations. The review of literature which formed the basis for the study and conceptual framework are presented in Chapter Two.

Chapter Three contains a description of the study area and profile of NGOs as well as the design and procedures that were followed. Items described include the survey population, sample size and sampling procedures, and instrumentation. The data collection and analysis strategies are also presented in the chapter. The results and discussion of findings based on the analysis of data are captured in Chapter Four. A summary of the study, the conclusions, recommendations and suggested areas for future research are presented in Chapter Five.

CHAPTER TWO

REVIEW OF LITERATURE

Introduction

The purpose of this chapter is to review the literature relating to the research questions of the study. The first section deals with the concept of NGOs. The second section describes the profile of NGOs, overview of interventions, NGO interventions and agricultural extension, distinct features of NGOs and agricultural activities. The next section deals with the mode of operation of NGOs. This is followed by demographic and farm-related characteristics of clients. Also included in this chapter is the effect of NGO interventions on agricultural activities, followed by the conceptual framework based on the concept of perception.

Concept of NGOs

The term NGO has been defined by various people but without any consensus as to what an NGO is. It may include voluntary organizations, solidarity agencies, international NGOs, so-called quasi-NGOs and a variety of other arrangements (The Courier,1995).

According to Godenker and Weiss (1995), NGOs are private, self-governing, formal and non-profit organizations. They are described as private because they are not affiliated with government; self-governing, that is, they are autonomously managed or they are controlled by those who formed them

or by Boards of management; formal, meaning that they passed through the laid down process of registration and are officially recognized; non-profit organization, indicating that they are not formed for private profit or gain. Vakil (1997) indicated that NGOs should be described as 'not-for-profit' rather than 'non profit' or 'non-profit distributing', arguing that the definition as it stands would exclude certain organizations that have this attribute even though the generation and distribution of profit is not a primary goal of NGOs.

Godenker and Weiss (1995) omitted the 'voluntary' feature from their definition in acknowledgement of the fact that there is increasing professionalization of the NGOs sector. However, Fox (1987) described NGOs as voluntary. They are formed voluntarily and participation is voluntary. In Vakil's (1997) tentative structural-operational definition, she stated that NGOs are geared to the improvement of the quality of life of disadvantaged people. The World Bank defines NGOs as private organizations that pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services or undertake community development (as cited in Gibbs, 1999, p.1).

NGOs are established organisations that have an organizational structure with regular meetings and rules of procedure. They have their own laws and policies which are adhered to by the members or trustees. An NGO is formed by an individual or a group of people with the aim of bringing development while targetting certain groups or areas.

NGOs have orientations. These refer to the types of activities that NGOs engage in. Vakil (1997) identified six categories: welfare, development, advocacy, development education, networking and research. Elliot (1987)

defined welfare activities as the activities that deliver services to specific groups of people based on the charity model. The initial stage of development of NGO sector in the 1960s and 1970s was welfare-oriented, aimed at the direct provision of basic needs to poor people in times of natural disasters and wars (Korten, 1987; Brodhead, 1987). These NGOs are termed first generation NGOs.

The development approach emphasizes development projects that increase the productive capacity of self reliance (Elliot, 1987). The advocacy orientation aims at influencing policy or decision making in relation to particular issues while the development education focuses on the education of the citizens of countries concerned. The last two orientations have developed more recently, that is networking and research. Networking-oriented NGOs channel information and provide technical and other assistance to individuals and lower level NGOs at national and regional levels. A research NGO is concerned with participatory research which will pave the way to carry out interventions based on sound information (Vakil, 1997). Korten (1987) categorized NGOs as first generation (relief and welfare), second generation (small-scale self-reliant local development) and third generation (sustainable systems development).

The goals of NGOs are usually related to solving problems involving economic, social and cultural order of a country or region (Frantz, 1987). Landim (1987) also indicated that the actions of NGOs are also based on the political contexts of the countries in which NGOs operate. Many authorities distinguish between international, national and community-based NGOs. International NGOs are based in the industrialized countries, national NGOs in

the countries of the Third world and community-based organizations in local communities of the Third world. A fourth type that serves whole regions in the Third world has been added. It is called regional NGOs (Vakil, 1997).

There is partnership relationship between international NGOs, on the one hand, and national NGOs on the other hand (Elliot, 1987; Malena, 1993). A financing relationship exists between NGOs in the North and in the South. Most Southern NGOs seek financing from a number of NGOs in the North for their work (De Crombrugghe, 1995). African countries, for instance, depend totally on financial support from their public or private partners in the West. (Ba, 1995).

Overview of interventions

Interventions are specific activities carried out by government or public organisations to prevent or modify the course of events or to influence a situation in some way. Interventions are intended to promote, protect or restore the livelihood of people. World Bank noted that on the public role in low cost private interventions, government cannot be responsible for every one's daily life, and can probably contribute most by improving households' capacity to look after their own health. Promoting development generally not only increased incomes but more education and access to all kinds of knowledge, goods and services seems to be the best way to do this (as cited in Musgrove, 2004, p.46). Interventions have social and economic goals. Basically, they are intended to empower the poor. This will enable the poor to confront and deal with the systems and structures that cause their socio-economic or political marginalisation in the first place. The poor can then build the capacity to advocate and protect their interests vis-à-vis the society

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(IFAD, 2000). Poverty reduction, increased income and saving, increased efficiency and improved livelihood of beneficiaries are major goals of interventions. The World Bank (2005) stated four aims that the health systems interventions usually attempt to achieve:

- Increase the health status of the population;

- Reduce poverty and socio economic inequalities in health outcomes;

- Provide services at a lower cost or get more for the same cost; and

- Increase patient satisfaction;

These aims are in some respects applicable to other interventions.

Musgrove (2004), looking at the choices for state intervention, posed two questions:

- How do governments intervene?

- What should the public sector do, giving that some problem in the private market appears to warrant some public action?

Government failures often result from intervening in the wrong ways or with the wrong instruments. Musgrove (2004) listed five distinct instruments of public intervention: arranged from the least to the greatest intrusion into private decisions. These are to:

- Inform which may mean to persuade, but does not require anyone to do anything;

- Regulate, which determines how a private activity may be undertaken. Regulation is usually pursuant to a law, and is often determined by an executive or administrative body;

- Mandate which obligates someone to do something and (usually, though not always) to pay for it;

- Finance health care with public funds; and

- Provide or deliver services using publicly-owned facilities and civil service staff;

All the instruments mentioned have cost; even information is not free. The benefits from any intervention must be weighed against the costs. There are certain conditions that justify interventions. Musgrove (2004) enumerated three conditions under which specific public interventions may be justified: ignorance or incomplete knowledge; externalities; and the failure of adults to act as appropriate agents for children. Ignorance is not corrected by telling people something new, but a larger question of changing beliefs and behaviour. Externalities refer to interactions among presumably informed adults.

Interventions occur in industry, health, agriculture and practically every area of human endeavour. Some of these succeed and others fail. According to the World Bank (2005), many health sector interventions do not work, and some are even harmful. Interventions come in different forms. These include: subsidies and regulations (World Bank 2005); pricing policy (Brandao and Carvalho, 1991); mandates and training (Musgrove 2004); and organizational reforms (Preker, 2003).

NGO interventions in agriculture

NGOs are not an end unto themselves, existing rather "at the service" of the exploited and under-privileged sectors of the population. NGOs are there to serve. This kind of service is carried out through development projects or programmes. A development project is a planned set of activities aimed at satisfying the needs of poor sectors of the population. A development programme includes several projects. Both require financial resources from other entities (Landim, 1987).

The way of serving can differ. The emphasis the NGOs place on their ideas may differ. The groups they work with as well as the types of projects they execute vary. Direct intervention seems to be the most common and widespread style of work. Emphasis may be placed on activities aimed at directly meeting the needs of or improving conditions for their target population. Thus, they carry out projects directly affecting material living conditions, involving economic activities, such as initiatives regarding alternative forms of production and marketing in rural areas. Other NGOs gear their actions to long- term structural transformation of society, and therefore, emphasize organizational and training activities as well as education. The knowledge base of the rural farmer may be so low that it could hinder him/her from profitably engaging in farm business. In agriculture, NGOs are active in educating clients, extending knowledge and skill in production, technology and management to help clients in their enterprises. Frantz (1987) enumerated the role played by a Brazilian NGO, Movimento Communitario de Base (MCB) in developing a methodology for organizing peasants in northwest RS into hundreds of cells through which knowledge on all aspects of their lives

was transmitted. The methodology became a "model" for most of the agricultural cooperatives and rural workers unions in the state.

In Ghana, Technoserve, a non-profit international NGO, offered training courses to rice and shea farmers as well as processors in value addition and business management as part of the strategy to revamp the rice and shea industry in the Sene Municipality in the Brong-Ahafo Region. It was meant to upgrade the knowledge and skills of the clients and boost employment (Ghanaian Times, 2004:11). Education and training are important interventions used by NGOs to help the rural farmers break out of their condition of poverty and ignorance.

NGO interventions in agriculture cover areas such as:

- Land preparation;

- Cultural/management practices;

- Improvement of soil fertility;

- Input supply;

- Processing;

- Storage and preservation; and

- Marketing.

In 1996, the Co-operatives for Assistance and Relief Everywhere (CARE) undertook a programme to upgrade, rehabilitate and subsequently manage 40 small dams in the low rainfall communal areas of Zimbabwe based on the interest of the communities. CARE International promoted the marketing of agro- inputs and outputs as well as increased grain production (IFAD, 2000). The Department of Agrarian Reform and local NGOs undertook agrarian reform in the Philippines with funding from IFAD. The

project also supported community resource management, including: the introduction of sloping arable land technology in upland areas; improved, low-input rain-fed cropping technology; the establishment of mangrove plants in coastal waters to promote the regrowth of fish stocks and the provision of seedlings for high- value wood lots (teak and mahogany) on tenure secure holdings (IFAD, 2000). When farmers adopt technologies they are in a better position to overcome risks and increase yields.

Some interventions like processing, storage and preservation are meant to reduce post- production losses and, therefore, make available agricultural products at affordable prices. According to Johnson (1983) interventions in marketing are intended to:

- Help the farmers improve their competitive position;

- Provide confidence for long- term production;

- Obtain economies of scale;

- Even out seasonal supplies;

- Stabilize prices;

- Make the best of differing markets; and

- Raise both demand and quality.

NGOs and agricultural extension.

Agricultural extension is the conscious provision of information and communication support to rural users of renewable natural resources. It involves offering advice, helping farmers analyze problems and identifying opportunities, sharing information, supporting group formation and facilitating collective action (Garforth, 1997).

In support of this, Farrington (1997) stated that extension conventionally comprises several of the following functions:

- Diagnosis of farmers' socio-economic conditions and of their opportunities and constraints;

- Message transfer through direct contact between extension agent and farmer or indirect contact involving intermediaries such as contact farmers or voluntary organizations; through training courses and through mass media. Messages may comprise advice, awareness creation, skill development and education;

- Feedback to researchers on farmers' reaction to new technology to refine future research agencies;

- Development of linkages with researchers, government planners, NGOs, farmers' organizations, banks and the private commercial sector. In remote areas, extension agents have taken on a number of these functions directly; and

- Monitoring of the extension system and evaluation of its performance at farm level.

Agricultural Extension Agents (AEAs) are responsible for implementing extension programmes through their visits to farmers and their fields. Their activities are intended to increase productivity and income of farmers. The role of NGOs in agricultural extension is to supplement government efforts since the task of developing agriculture in developing countries is a daunting one. Swanson and Sammy (2000) noted that as a result of declining public

resources, some national governments have welcomed the opportunity to shift some extension responsibilities to NGOs.

The NGOs have not only been accepted but it has been found out that they have some merits over the public extension system. According to Lewis and Kenny (1988), international donors view NGOs as more effective in community mobilization, especially when contrasted with the bureaucratic government extension services. Musgrove (1996) also noted that NGOs tend to be managed more efficiently than public extension systems and have lower operational costs. It can be deduced, therefore, that lower operational costs make funds available to undertake more development projects.

NGOs utilize participatory extension methods which help to explain why they have been more effective than top-down extension systems. They are able to draw on local knowledge to ensure that introduced technology is appropriate for resource poor farmers (Chaguma & Gumbo, 1993). The needs of farmers are varied and many, and sometimes responses either fail to come or come too late. Farmers' plight are worsened, but for quick responses of NGOs. Most NGOs are relatively small, horizontal or flat structured organizations with short lines of communication and are, therefore, capable of responding flexibly and rapidly to clients' needs and interests (Farrington, 1997). The structure allows many NGOs to deliver a range of services where public extension cannot take action and to respond quickly to remote areas (De Jong, 1991). The merits of NGOs over the public extension system may explain why NGOs can be the driving force behind agricultural development and why their involvement in agriculture is being encouraged.

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Distinct features of NGO agricultural activities

African NGOs are today acknowledged as important players in the socio-economic and political reconstruction currently taking place in the continent, despite all the problems they encounter (Ba, 1995). According to Bebbington (1997), NGOs have always been in part a response to state failure, market failure, and weaknesses in popular organizations. It appears that they have a clear understanding of the agricultural activities of the farmers and the natural, social, economic and political environment in which they are carried out. Donors have, therefore, begun to call for more NGO involvement in innovative projects and programmes in rural and agricultural development.

IFAD's collaboration with NGOs in the fight against rural poverty and hunger is based on certain features of NGOs. These distinct features and merits enumerated by IFAD (2000) are:

- NGOs are often able to reach segments of rural populations that governments neglect or do not target as priority. They often find their way into remote rural areas to identify the poorest segments of communities, deliberately seeking out those who are normally excluded from development processes because of their isolation, their lack of assets and their vulnerability;

- NGOs engage the poor in capacity-building activities as a major component in their programmes and projects. Whether literacy programmes or agricultural extension or handling of credit, these activities lay the foundation for creating local groups and organizations having common interests through federations, coalitions, networks, etc;

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- NGOs are recognized for their role in developing new initiatives, new programmes or components of programmes, new approaches, new mechanisms, etc. to address development problems and issues. Certainly, NGOs have been in the forefront of many innovations that have provided ideas and models that have been replicated or adapted in other settings and situations. Many NGOs, with their generally flexible organizational structure and characteristics which include organizational independence, participatory structures and willingness to spend time on dialogue and learning, are able to experiment on new institutional mechanisms and different approaches that add value to projects;

- NGOs possess extensive knowledge of local conditions. Sometimes innovation is not the answer, but rather a sober consideration of the normal needs of small enterprises (which is what the economic operations of the rural poor principally are) and serious attention to how these needs can be sustainably served. In this regard, NGOs with long-term experience in the target area can help provide baseline data and information on the local economy and infrastructure, the existence (or absence) of self-help organizations, and the major obstacles to development; and

- NGOs deem active participation by the poor in their development process as an essential precondition to their empowerment - participation not only in the implementation of

programmes or projects but also in their conceptualization, design, monitoring and evaluation. Over the years, NGOs have developed highly effective participatory processes - to analyze and to act upon their situations through their own eyes, and not as defined by outside agencies or development agencies.

NGOs have concern for the rural poor, ability to identify their needs and tailor their methodology to farmers' circumstances. They respond quickly to the needs and circumstances of clients. The OECD Observer stressed the commitment of NGO staff to their work and the fact that they can operate more flexibly, subject to fewer rules and regulations, and, hence, more rapidly (as cited in Twose, 1987, p.7). Brodhead (1987) also cited the qualities of innovation and flexibility. Gibbs et al. (1999) identified potential strengths of NGOs as the ability to operate at low cost, identify local needs, build on local resources and introduce new technology, among others.

NGOs, however, have technical weaknesses. According to Korten (1987), their technical competence may not be questioned when they work on a small-scale in a few villages with people who have few options and their technical failures will attract little publicity beyond the village that suffers the consequences. But when NGOs position themselves to be systems catalysts, their technical weaknesses become more apparent.

Farrington (1997) found that the small size of NGOs is an indication that their projects rarely address the structural factors underlying rural poverty. Small size, independence and differences in philosophy militate against learning from each other's experiences and creating effective forums. Ayers (1992) also observed that some fashionable locations have become so densely

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populated by a variety of NGOs that problems have arisen not only of competition for same clientele but some undermining the activities of others.

In summary, Gibbs, Fumo and Kuby (1999) identified NGO weaknesses as their limited replicability, self-sustainability, and managerial and technical capacity, a narrow context for programming, and politicization.

Agricultural activities

The following are some agricultural activities on which interventions are expected to increase production, reduce losses and ensure food security:

- Land preparation;

- Planting;

- Weed control;

- Application of chemical fertilizers and organic manures;

- Disease and pest control;

- . Processing;

- Storage and preservation;

- Marketing;

- Livestock housing;

- Feeding of animals;

- Maintenance of animal health;

- Packaging; and

- Grading.

Land preparation

Crop production requires good soil or land preparation as this can lead to increased yields. Land preparation differs depending on climate, type of soil,

vegetation, topography and degree of mechanisation. Land preparation involves clearing the land, stumping and tilling. When the land is tilled the soil is made loose and friable. This facilitates seedling emergence and root penetration. Beside these, there is improvement in soil aeration and drainage. Weeds are easily controlled in the early stages of crop growth (Fakorede, 1982). An innovation that is currently being promoted is zero tillage. According to Gomez (1986), yield from crops grown without tillage is just as high as under normal culture. If weeds can be adequately controlled, zero tillage can save ¼ of the cost of production and turn - around time can be reduced by 10 to 15 days.

Planting

Good sowing and planting arrangements determine the way the plants develop. The methods of planting also influence the growth of seeds or seedlings. Planting is done when the rains have sufficiently moistened the soil (Akinsanmi, 1999). Planting at the right time ensures availability of adequate moisture for germination.

Correct and adequate spacing enable farmers to achieve optimum plant density. When the spacing is too close, there is competition between plants and this results in depressed yields. With bigger spacing, crop density is low and more space is made available for weeds. Akinsamni (1999) pointed out that spacing must be strictly controlled to prevent either overcrowding or too low a plant population. Row or line planting as an agricultural technology affects crop production as it determines plant density and facilitates the use of machinery and post- planting operations (Dupriez & De Leener, 1989).

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Weed control

Adequate and effective weed control is essential for maximum yield. Weed control must be timely, even before the weeds seed. Losses in crop yield due to weeds may be greater than those due to plant pest and disease. Weeds affect agriculture in the following ways:

- Weeds compete with crop plants for space, moisture, sunlight, plant nutrients and soil oxygen resulting in reduced yields

- Some weeds habour pests and diseases by acting as host.

- Quality of produce is reduced.

- They reduce the palatability of useful pasture grasses.

- Some weeds contain toxins which may be dangerous to farm animals (Akinyosoye, 1984).

Application of chemical fertilizers and organic manures

Fertilizers and manures are applied to supply deficient nutrients. The result is that they promote plant growth and development and increase yields. El-Akhrass (1987) indicated that fertilizer application and chemical weed control may enhance the yield by 0.35 to 0.74 tons of grain and 0.35 to 0.64 tons of straw per hectare.

Organic manures are bulky plant residues and animal excreta that are applied to the soil to improve the fertility. The concentration of plant nutrients in organic manures is low but the spectrum of nutrients in manures is wide. One major advantage of manures is its capability of improving the physical properties of soils.

To get maximum benefit from fertilizers, Dupriez and De Leener (1989) made the following recommendations:

- Apply fertilizer at the time when plants need it and can use it – time of growth, time of fruit set and fruiting;

- Apply fertilizer near the root not too near the stem but within the root zone;

- Choose fertilizer after deciding how long its effect should last;

- Apply fertilizer in small successive splits rather than in heavy spreads. This spreads surplus fertilizer not used by plants from being leached down by rainwater;

- Only apply fertilizer on well- structured soils containing enough organic matter and humus.

- Vary the fertilizers used, do not apply the same one all the time.

- Do not mix chemical fertilizers on your own initiative because such mixes are not always effective.

It is essential, therefore, that fertilisers are applied at the correct time and in correct quantities.

Disease and pest control

Diseases and pests contribute immensely to crop losses in the field and in the store. Diseases are basically deviations from the normal functions of plants. Diseases lead to general reduction in agricultural production and can easily bring about total destruction of crops. It has been estimated that plant diseases cause about 20 percent of the world's total loss of agricultural production (Akinsanmi, 1999). Diseases reduce the growth, yield and

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economic value or quality of crops. According to IITA (1990), disease of cassava, for instance can affect plant establishment and vigour, inhibit photosynthetic efficiency and cause deterioration. Severe infestation often results in considerable yield loss.

Pests cause damage to plants by feeding on them. They feed on practically every part of the plant which may deprive the plant of nutrients, lower photosynthesis, reduce seed viability and rate of growth, reduce quality and quantity of produce. It is therefore important to control pest and diseases by means of effective methods and in a timely manner.

Processing

Food processing in the food production chain is crucial to agricultural and industrial development in developing countries and for food security. Ndi (1993) defined food processing as a 'value adding' process by which perishable food materials are converted into shelf- stable convenient and palatable food. According to him, food processing has a positive impact on the economy by reducing food imports and boosting exports, expanding the market for food crops, increasing the cash income of rural farmers, promoting more efficient agricultural production, and by increasing employment opportunities.

Ndi (1993) identified marketing as an important factor for the success of the food processing industry in developing nations. The multicultural nature of Africa provides a potential market for a variety of inexpensive processed traditional foods.

A collaborative study between the University of Georgia Agricultural Experimental station and the University of Nigeria, Nsukka showed how food processing facilitated the production of traditional foods. In the study a mechanical process was developed to produce ready-to-eat cowpea flour that retained the flavour, texture and nutritional quality of the traditionally produced equivalent. Using the mechanically de-hulled cowpea flour reduced meal preparation time and saved between 15 percent and 40 percent in human energy (Philips & McWaters, 1991). Time, money and energy are saved by purchasing efficiently processed and convenient food products at affordable prices.

For the food processing industry to be successful, there must be adequate and dependable supply of raw materials. The small-scale food production is insufficient to meet the needs of a food processing industry (Ndi, 1993).

Processing methods include drying, milling/pounding/grinding, fermentation, and curing. Considerable quantities of fruits and vegetables are processed by dehydration, canning and freezing in developed countries. In developing countries, small amounts of these commodities are processed for local consumption although large volumes of some commodities are processed for export. Dehydration or sun drying is the simplest and lowest cost method. The crops are spread outside on the ground, on mats or on elevated platforms to dry. Heat may also be applied for drying crops.

Storage and preservation

Storage is the holding of crops until consumption. Colecraft (1993) found that proper storage increase shelf-life and minimizes contamination. Lieberman (1983) stated that an alternative solution to the problem of meeting

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increasing food demand is to reduce post-harvest losses by improving storage and conservation or processing. In times of glut during the peak season farmers have no alternative but to sell their produce at very low prices. They are unable to control prices during this peak period. They may even sell excess supply on credit to wholesalers. Lack of storage facilities and the seasonality of production results in price instability.

Storage allows for the period of availability of a certain product to be extended. It enables producers and traders to postpone sales in order to take advantage of better prices. In addition it tends to smooth variations in product availability due to seasonal or other factors, increasing the regularity of consumption throughout the year and reducing price instability.

The convenience of a product to the consumers is enhanced by the fact that storage permits larger but less frequent purchases, thus reducing the number of trips to the market and the time and transaction costs involved. Storage of food allows continuous supply of materials for processing and distribution.

ADRA trains local artisans to construct cribs for farmers apart from giving the farmers some roofing sheets gratis. Storage is carried out in underground structures and pits, baskets, sacks, air-tight structures, metal drums and bins, earthen structures, cement and concrete structures, silos, basins, crates, refrigerators and freezers.

Micah, Anokye and Britwum (2000) stated that technologies used for storing fresh vegetables are indigenous and are able to keep the vegetables in good condition for only a few days. Tomatoes spread on cemented floor have longer shelf-life than those stored in baskets and basins; those stored in crates

have the shortest shelf-life; the storage method that gives the two vegetables (tomatoes and garden eggs) the longest lasting period is freezing. There is an absence of appropriate technology for long-term storage of these highly perishable vegetables in their fresh forms.

Several precautions are taken to minimize the extent of product deterioration during the time it is stored and these include the following:

- Avoid product contamination with flies, dirty oil and other contaminants.

- Refrigeration

- Keep products in plastic warmers, containers covered with polythene, air-tight nylon packs.

- Protect produce from rodents.

Preservation is the prevention of loss or spoilage of foods or the slowing down of the changes involved in spoilage. Micro-organisms, such as bacteria and fungi, rapidly spoil food. Enzymes which are present in all foods, promote chemical changes which affect texture and flavour. Atmospheric oxygen may react with food constituents causing rancidity or colour changes (Taylor-Davis & Stone, 2004).

Consumption of food produce by insects, rodents and other animals causes loss of food, reduction in quality of food through contamination with excreta and they also impart unpleasant odour to the produce. Mechanical damage resulting from bruising and cutting also constitutes primary cause of loss of produce.

Techniques used in food preservation help eliminate the moisture or temperature conditions that favour the growth of micro-organisms. These

micro-organisms have the potential to cause food-borne illnesses. According to Taylor-Davis and Stone (2004), they break down foods, producing unpleasant changes in taste, texture and appearance – changes that we recognize as spoilage. The preserved food should retain palatable appearance, flavour and texture, as well as its original nutritional value. Methods of preserving crops include canning, freezing and refrigeration, drying and dehydration, irradiation and use of chemicals.

Marketing

The term marketing refers to a set of business activities designed to plan, price, promote and distribute products that satisfy wants to target markets (groups of customers) to achieve the objectives of the organization (Stanton, Etzel, & Walker, 1991). Marketing should be customer-oriented and should start with an idea about a new product.

In the context of commercialisation of agriculture, marketing of agricultural produce has emerged as a challenging area. It requires smooth channels for the transport of produce, physical infrastructure such as warehousing and market complex and credit support to producers.

In developing countries, a considerable amount of food is wasted because of poor marketing procedures. Much produce is spoiled because it is stored beyond its inherent shelf-life before marketing is completed. Improving transportation and marketing facilities, and reducing the numbers of steps between producers and consumer are methods that can be used to shorten the time between harvest and consumption. Many farmers find it difficult to dispose of their produce when there is excess production. They are compelled to sell the surplus at low prices. Failing that, the produce is left to deteriorate.

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Owusu-Sekyere (1997) pointed out that, farmers all over the country lack a ready market to sell their produce. This has over the years affected the economic status and morale of farmers and rendered farming less lucrative. Improved marketing facilities are important in ensuring that excess production reaches consumers efficiently. In a competitive economy greater marketing efficiency will not only give farmers higher prices but also give consumers lower ones and thus expand their buying power. For economic development it is important to raise farming output but equally so to develop marketing so that the extra reaches consumers efficiently (Johnson, 1983).

Various attempts have been made by governments of this country to incorporate marketing policies into the economic development plans. The following reasons have been cited for government interventions in marketing.

1. The strategic value of agriculture to the nation

2. To help the farmers improve their competitive position, to provide confidence for long-term production, to obtain economies of scale, to even out seasonal supplies, to stabilize prices, to make the best of differing markets and to raise both demand and quality.

3. To help consumers by ensuring and expanding supplies and by stabilizing prices.

It is difficult to plan production rationally with unstable prices. This is bad for the whole farming industry and can be disastrous for individual farmers. Therefore to give some stability to the industry and to encourage growth, most governments intervene in the marketing of many of the main farm products, both economically and physically. Provision by government of physical infrastructure to aid efficient marketing includes roads, railways,

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telephones, market places, storage and handling depots and processing plants (Johnson, 1983).

It has been found that a project's major input is likely to be on the system of marketing. It may lead to higher production and more stable consumer prices. Also an impact will be significant reduction in produce losses and an efficiently operating market for both producers and traders. This will serve to reduce marketing costs, which will ultimately benefit consumers. A positive effect will be the growth of small-scale traders and wholesalers. The mere provision of new or improved physical facilities will not guarantee any benefits, if not accompanied by appropriate institutional and management changes.

Livestock housing

Farm animals require good housing for growth and production. Houses are usually built in well-drained areas with materials that are not only durable , but capable of minimizing drastic fluctuation in ambient temperature . Poor housing imposes stress on animals and this affects their performance. Crowding and other stress conditions can lead to feather picking, cannibalism mortality and reduced production in poultry. A suitable house for farm animals must have the following characteristics.

- It must be spacious. Overcrowding in pens results in dirty and wet conditions creating unsanitary conditions and build- up of disease causing agents.

- It must be dry.

- It must protect the animals from predators and inclement weather.

- It must be easy to clean.

- It must be well ventilated.

Koney (1992) listed the following reasons for housing ruminants:

1. The provision of shelter and shade to protect animals against adverse weather conditions such as the direct effect of solar radiation and wet conditions. Inclement weather causes 50 percent mortality in kids, lambs and calves;

2. It enhances their examination and treatment; and

3. It protects animals from thieves.

Feeding of animals

Food is given to livestock with two main aims in view. Firstly, to keep the animal active and healthy, and secondly, as a means to improve the quality of the product provided by the animal that is the quality of the meat, fat, eggs, milk, wool, hide (Komolafe & Joy, 1981). The quality and quantity of food given to farm animals contribute to their level of production. Animals perform well on balanced and adequate feed. Balanced ration contains all the six nutrients – carbohydrates, fats, proteins, vitamins, minerals and water- in the correct proportion and amount. Feed and fresh, clean water are provided to animals regularly and adequately.

Feed is formulated to cater for the type, species and age of farm animals. Thus there is a variation in the nutrients and fibre contents of the feed. To maintain the metabolic or life processes, animals are given maintenance ration. Additional nutrients, other than those needed for maintenance requirement, provide excess nutrients for the production of animal product and for reproduction and fattening. (Baffour, 1981). If an animal is not well fed or

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nourished it suffers from malnutrition. The symptoms include stunted growth, drop in productivity, susceptibility to disease and a fall in general condition.

Maintenance of animal health

Health is a condition in which all the organ systems and body structures are working in full harmony (Kekeocha, 1984). The health of farm animals is crucial to successful and profitable farm enterprise. Animals that are well nourished and managed usually remain healthy, if they are few in number and provided with adequate space. Ill- health in farm animals is caused by pests, parasites and pathogens.

This study focuses attention on the health of poultry and small ruminants because they are the most commonly reared animals and more so under the extensive system. MOFA gave the estimated populations of these animals for 2001 as follows: poultry, 22,032,000; sheep, 2,771,000; goats, 3,199,000 (MOFA, 2002).

Many farm enterprises could be rendered unproductive by diseases. Disease is a deviation from normal health. Diseases are a big risk to farmers. In poultry one of the commonest diseases that affects the birds is Newcastle. It is a viral disease characterized by its sudden onset, respiratory symptoms, nervous symptoms and high mortality. Baffour (1981) reported mortality rates of 90-100% in severe outbreaks. This disease normally affects birds during the harmattan and especially in the villages. The disease spreads rapidly. According to Baffour (1981), transmission of the disease is through excretion, eggs, frozen poultry carcasses, improper disposal of dead birds on farms, undetected outbreaks in hatcheries and traffic of birds. Outbreaks of the disease at certain times of the year may be due mainly to traffic of birds.

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Methods of prevention are vaccination, good sanitation and isolation (Kekeocha, 1984).

Tick- borne diseases are common in sheep and goats. The ticks parasitise on the animals by sucking nutrients and blood. Koney (1992) pointed out the following effects of tick infestation:

- Ticks transmit diseases such as heart-water and babesiosis.

- They cause damage to hide.

- Tissue damage followed by secondary bacterial infection. Tick-infected site on the foot may result in severe lameness due to infection.

- Tick worry. Animals severely affected with ticks become restless and do not eat well.

Heart-water is a rickettsia disease characterized by anorexia, muscular tremors and nervous signs. In peracute cases affected animals die rapidly without showing symptoms. Early treatment of affected animals is recommended but control of the tick vector is considered more rewarding. Acaricide preparations in the form of sprays, dips or dusting are effective control measures. Pour-on acaricide preparations, which are easy to use, are now available on the market (Koney, 1992).

Packaging

Packaging refers to all the activities of designing and producing the container or wrapper for a product. Three reasons have been put forward to support packaging (Stanton et al., 1991). First, packaging serves several safety and utilitarian purposes. It protects a product on its route from the producer to

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the final customer and in some cases even while it is being used by the customer. Effective packaging can help prevent ill-intentioned persons from tampering with products. Also, compared with bulk items, packaged goods generally are more convenient, cleaner, and less susceptible to losses from evaporation, spilling and spoilage.

Secondly, packaging may be part of a company's marketing programme. Packaging helps identify a product and thus may prevent substitution of competitive products. At the point of purchase, the package can serve as a silent sales person. Thirdly, a firm can package its product in a way that increases profit and sales volume. A package that is easy to handle or minimizes damage losses will cut marketing costs, thus boosting profits. On the sales side, packaged goods typically are more attractive and therefore better than items sold in bulk.

Packaging facilitates handling and extends the shelf life of a product. A good package sometimes gives the producers more promotion effect than it could possibly afford with advertising. An attractive package may speed turnovers enough to reduce total costs as a percentage of sales (McCarthy & Perreault, 1993).

Kyeremanten (2005) underscored packaging as an important component of the production and supply chain and urged producers to consider the choice and mix of their packaging to create a good image for each product to make it internationally competitive. According to him an appropriate, cost-effective and good quality packaging would enhance the shelf impact of made-in-Ghana goods.

Grading

Farmers would normally aim at presenting goods to potential customers in a most appealing and convenient way. One way of doing this is by grading the produce. Grading is the process of sorting farm produce into uniform lots on the basis of certain desirable characteristics. It may be carried out by farmers and marketing organizations to ensure that the produce satisfies the needs of consumers (Kwarteng, 1994).

For good grading of farmers' produce, exact standard specifications must be known by all concerned. Some factors affecting quality and grade include evenness of size, shape and quality, condition, purity, flavour and freedom from pests and diseases (Johnson, 1983). Other factors used for grading include colour and ripeness. Grading helps farmers to get better prices for their produce (Sinnadurai, 1992). Good grading gives farmers good price as each grade has its own consumer market. Grading also helps to maintain high quality and promote exports.

Carney (1998) noted that a viable market infrastructure involves definition of weights, sorting and grading. Coste (1993) reported the use of equipment such as densimetric graders. The process can also be carried out manually.

Mode of operation of NGOs

This section describes the mode of operation of NGOs in their attempt to reach their target groups and achieve the desired results. This includes the selection of farmers, training, technology transfer, credit provision, agricultural information support, input supply and monitoring and evaluation.

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Selection of farmers

The selection of target and individual farmers for an agricultural programme and the way in which they are selected are of considerable importance in extension work. Cernea and Tepping (1977) reported that the target groups of Agricultural Extension projects in India comprised of the mass of small farmers, tenants and sharecroppers who constitute the vast majority of the farming population. Their goal is to increase their productivity, help them to meet their basic human needs and contribute to an overall increase in food production. Cernea and Tepping (1977) observed that the target group of extension, however, is not a socially homogenous population but a stratified one. It consists of tribal groups, landowners, tenants and sharecroppers, among others. The extension service has to adjust its advice and support to farmers with different cultures, possibilities, constraints and needs. It follows, therefore, that various factors are taken into consideration in the selection of clients.

Selection is made by extension agents. Their knowledge of the community and its members is crucial to the selection process. Consequently, they seek information from various sources including chiefs and opinion leaders. Aklilu observed that extension agents usually contact the target community through opinion leaders. According to him, opinion leaders are almost always the first recipients of information regarding innovations since change agents attempt to reach their target population through them (as cited in Buadi, 1992, p.106). Opinion leaders and other influential people may be of help to change agents in selecting beneficiary farmers. One key criterion for selection cited by Benor and Harrison (1977) and Benor and Baxter (1984) is

opinion leadership. Feder and Slade (1984) observed that since each extension worker is responsible for the selection in his area, personal preferences cannot be totally eliminated and experience has shown that agents in many extension systems tend to favour the wealthy and influential. Howell (1982) and Moore (1983) noted the frequent criticisms of the wealthy and powerful chosen as contact farmers for the T&V system and stated that these groups monopolize extension services at the expense of other less privileged farmers. Hoeper (1983) has shown that there is considerable variation in the application of selection criteria by extension workers. It is not, therefore, surprising that in some respects contact farmers are representative of the farming community as a whole, while in other ways they are significantly different.

Feder and Slade (1984) indicated that farmers who are more frequently selected as contact farmers are the wealthier, more educated, more favourably endowed with irrigation facilities and of higher social status than the majority. Critics of the T&V system frequently argue that contact farmers are chosen from among the wealthy and powerful.

Training

Farmers require training for proficiency in the farming business. Through training, they acquire the needed skills that enable them to carry out various activities from production to marketing. Hurley (1990) pointed out that people seek training when a skill is required to enable them improve their work: they need a clear incentive if they are to become involved fully in learning new skills.

Education and training are two aspects of human resource development at the two ends of a continuum. While education is concerned with increasing

one's understanding of the environment, training is concerned with activities that are designed to improve human performance on the job (Halim & Ali, 1997). Like education, training is the process of providing knowledge and skills and bringing about desired changes in attitudes in order to improve the competency of people being trained (Kwarteng, 1995). It is noted that when training is done with a concurrent development activity, it makes it easier for the farmers to apply their newly found knowledge. Training reduces the risk that farmers face in their work.

Technoserve, an International NGO trains farmers in production and other aspects of agriculture. Alhassan (2006) reported the capacity- building initiatives including literacy and numeracy training of farmers in the Brong-Ahafo and the three northern regions of Ghana by Technoserve as part of a five- year food security programme. Over four thousand farmers were to benefit from the entire literacy programme.

Three main methods are commonly used for training farmers, namely individual, group and mass methods. Training methods should be appropriate to farmers learning needs. It must take into account the number of trainees, nature of problems to be solved and the capacity of the extension service. Extension workers choose the method that is most effective in achieving their educational objectives.

The individual method involves the extension worker interacting on one-to-one basis with the farmers. This method has been found to be effective in the training of illiterate, small-scale farmers. Since it is time and energy consuming, the group method is preferred. Even after the group method has been used the individual method could still be used as a follow-up. The

extension method used for training farmers affects their decision to accept or reject a particular innovation.

Extension workers use the group method more frequently than the individual method as it benefits many more farmers and saves time. Group methods are especially effective in persuading clientele to try a new practice or idea. A group decision to try a new practice, for example, is likely to carry more weight in an area than a similar decision made by an individual.

Groups usually consist of members with the same or similar objectives. According to Garforth (1982), groups offer a more effective learning environment through mutual reinforcement and group pressure against the rejection of new practices or ideas. Groups exert influence on their members and consequently the members want to conform to the group. Influential people in a group also exert influence on the rest of the group to accept social change once they themselves favour the change.

It has been established that the group attitude to a specific problem depends on the degree of interest in the problem and how important they feel the problem is to them. The knowledge and experience of members of the group are helpful in solving their common problems.

Technology transfer

The introduction of innovation has been variously conceptualized but basically includes; two types of actors, an advocate of change and a potential acceptor of change; the situations in which these actors operate; communication between the actors; and the subject of that communication, a new thing or an idea.

Byrnes (1978) observed that, as a process, the introduction of innovation involves: the innovation; the information about the innovation; the communication of such information to potential adopters; a channel or medium through which the information is communicated; evaluation of the innovation by the individual; the allocation of resources to acquire the innovation or the appropriate inputs for a trial of the innovation; and finally, an adoption decision.

An innovation is any idea, object or practice perceived as new by an individual. African farmers have depended largely on traditional farm practices and tools in performing farm activities. As a result they get easily fatigued and suffer damage to their bodies and overall health. This partly explains the low farm productivity. They spend long hours doing arduous work on processing, storage and marketing of crops. Regrettably, they continue to suffer the drudgery associated with these productive activities because of their limited access to agricultural technologies. Some factors responsible for this limited access are:

1. Limited access to education in science and technology (especially in agriculture);

2. Lack of access to credits needed to purchase technologies;

3. Absence of collateral (such as land and other property); and

4. Lack of information or knowledge about the range of technological alternatives (Olorunnipa, 1993).

Olorunnipa (1993) indicated that there appears to be an increasing awareness in developing countries that the use of improved technologies is a sine qua non for expanding food supplies. However, choosing 'appropriate

technologies' and giving both men and women 'fair' access to these technologies has been a major agricultural development problem in Africa.

Srivastava (1985) and Carr (1981) summarized the desirable characteristics that should be incorporated into agricultural technologies for African farmers as:

1. Simplicity such that it can be easily understood;

2. Availability at the needed time and place;

3. Affordability without incurring high personal debts;

4. Locally produced or easily adaptable;

5. Have minimal impact on unemployment;

6. Involve low risk;

7. Conformable to the traditional farming system;

8. Adequate supply of complimentary inputs; and

9. Reduce physical burden and drudgery.

Technologies and innovations with such characteristics are likely to be accepted by farmers. A major criticism levelled against production technologies in the Philippines is that they greatly favour well-to-do farmers. The main bases of the criticisms are that:

1. The new technologies are based mainly on the use of modern varieties, which respond better to fertilizer use, but require large investments that most small farmers cannot afford;

2. They were best suited to farmers with the most favourable environment such as good irrigation, good soils and this farms usually belong to the rich farmers; and

3. Government rice and corn production programmes have given priority to areas with favourable environment because those areas are perceived to have the highest chance of success. Those areas therefore received the bulk of investment in credit, fertilizer and technical support.

Economists at IRRI alluded to the substantial opportunities that the new technology offered for increasing the income of the poorest sector of the rural communities. (Gomez, 1986).

Credit

Credit is a repayable loan, either in cash or kind given out by banks or other organizations. NGOs, co-operative credit unions, government agencies, marketing parastatals and the financial institutions constitute the formal sector of credit. Commercial banks remain uninterested in lending to small farmers because of the risk of default and lack of collateral. Ablordeppey (2003) reported that the demand for collaterals by financing institutions cut out many small scale and medium enterprises. Government sponsored credit is often the only type available to small holders in less developed countries.

The informal sector, made up largely of individuals, (traders, landlords or farmers themselves) lend money as a business. They are traditionally characterized as highly usurious and in positions of power due to lack of local competition (Yaron, 1992; Poulton, Doward & Kydd, 1997). The ADRA credit scheme involves the provision of inputs to farmers and repayment is effected after harvest.

Farmers require credit to modernize and expand their enterprises. Funds are needed to buy the business, obtain assets like buildings, machines and pay

wages and other expenses. Sufficient finances to cover costs must be available. Most crops take months or years to produce and the farmer must live and meet production costs until they are sold and bring in income. A study conducted by Country Women Association of Nigeria (COWAN), a non-Governmental organization (NGO), indicated that the credit facilities provided to women involved in agricultural activities enabled them to procure simple implements like hoes, knives, hiring of tractors and purchase of fertilizers (Iheduru, 2002). It is a key element in the adoption of new technologies and in the processing, storage, preservation and marketing of crops. Johnson (1983) also emphasized the importance of credit in improving rural living standards and in the acceptance of innovations.

The credit ensures that the farmer can finance new techniques and these in turn, provides a sufficient rise in income to repay the loans with interest. Interest rate is an important factor in farmer decisions to access credit. According to Iheduru (2002), members of Family Economic Advancement Programme paid an interest rate of ten percent for loans. This brought about an upsurge in economic activities at the grass root level and created avenues for the people to earn higher incomes.

No agricultural credit programme can be effective unless it is combined with satisfactory extension services and other forms of support (Johnson, 1983). The need for rural credit to small-scale farmers is supported by the FAO (1994), which stated that credit in the short run enables the poor to weather shock. Farmers are more likely to respond to interventions when such interventions are accompanied by the provision of credit facilities.

Iheduru (2002) also pointed out that the timeliness of loan disbursement is crucial when loans are being used for seasonal activities such as agriculture. Farmers and processors who benefit from timely delivery of loans can undertake their activities when they wish to and this may enhance the prospects of repayments. Timeliness also means credit is not released too early where the potential for misuse is high before production actually begins.

Inadequate capital usually results in failure or in delayed payments and excessive interest charges. IFAD (2000) reported credit repayment rates of close to 98% in Bangladesh due to effective supervision of loans recoveries.

Agricultural information support

The responsibility of creating awareness of recommended practices rests on the change agent. These agents also convince farmers to adopt the practices. According to Garforth (1997), agricultural extension involves offering advice and sharing information; Farrington (1994) stated that extension conventionally comprises message transfer through direct contact between extension agent and the farmer or indirect contact involving intermediaries such as contact farmers and voluntary organizations, through training courses and through mass media. Messages may comprise advice, awareness creation, skill development and education.

Studies in Karnal and Muzafarnagar districts in India revealed that farmers acquire their knowledge from several sources, the extension service and other farmers being the most important. For most practices not involving specialized technical knowledge or major expense, contact farmers, under the T & V system, learn mostly from the extension service while non- contact farmers learn mostly from other farmers, including contact farmers. For

practices involving specialized technical knowledge all farmers tend to learn from knowledgeable primary sources, such as extension agents or other informed persons. (Feder & Slade, 1984).

Input supply

One of the factors that favour the acceptance of innovations is input. Farmers require inputs to implement recommendations of extension. Inputs are the goods, funds, services, manpower, technology and other resources provided for an activity with the expectation of producing outputs and achieving the objectives of a programme/project. Ruttan (1991) indicated that for necessary gains in crop and animal productivity, improvements must come from conventional plant and animal breeding and from more intensive and efficient use of technical inputs, including chemical fertilizers, pest control chemicals, and more effective animal nutrition. This means that high yielding varieties (HYVs) of crops and improved breeds of animals are part of the package that farmers require to improve farming. Some farmers, however, complain about their inability to obtain inputs. ADRA has taken up the challenge of supplying improved planting materials to farmers as well as processing machines such as corn mills and cassava graters.

Extension cannot make a significant impact on agricultural production if the inputs required to implement its advice are not available (although there are, of course, many productive technologies that do not require additional inputs aside from a farmer's labour). Extension advice is also important for input utilization since little can be achieved by farmers who do not know how to use inputs efficiently and profitably. In fact, extension has an important role in advising input agencies of the actual supply situation in the field and

anticipated demand and thereby co-ordinating input supply with farmers needs (Bernor & Baxter, 1984). Recommendations dependent on inputs are only useful if the inputs are available and farmers have money to purchase them. Extension can also encourage farmers to use inputs wisely in the light of their cost and scarcity. Good extension advice can lead to a reduced consumption of inputs (for example, irrigation water, pesticide, and fertilizer) by teaching correct applications and doses. The timely supply of agricultural inputs is as important to agricultural development as supplying suitable technical advice.

Monitoring and evaluation

Monitoring and Evaluation are important management tools that could contribute to the improvement of management efficiency. Both M & E assess and report on the reaction of the project inputs and activities. Cernea and Tepping (1977) defined monitoring, more specifically, as the collection of information on utilization of project inputs, on unfolding of project activities, on timely generation of project outputs, and on circumstances that are critical to the effective implementation of the projects.

According to Deboeck and Ng (1980), monitoring is a valuable management tool for providing timely information on project progress and performance. It also provides information on (1) deviations from the project objectives, (2) problems that are encountered, and (3) ways in which project management can take remedial action promptly.

Deboeck and Ng (1980) gave the primary reasons for monitoring rural development projects. First, to keep track of projects progress. Second, to provide feedback to project management on the achievement of project objectives. Third, to serve as a "warning" mechanism for project

management. Finally, to help prevent or solve problems encountered during project implementation.

Monitoring forms the basis for evaluation, both ongoing and ex- post evaluation. According to House (1980), evaluation is a process that leads to a judgment about the worth of something that leads to a decision to act in a certain way. Cernea and Tepping (1977) stated that ongoing evaluation is an action – oriented analysis of project effects and impacts. A major objective is to make an in-depth assessment, before project completion of whether the projects target group is getting the benefits of various components as these are implemented, in line with the assumptions underlying project design. Ex-post evaluation takes place several years after completion of the investment, to review comprehensively the experience and impact of a project as a basis for future policy formulation and project design.

The rationale for monitoring is different from that of evaluation. Evaluation is necessary to measure the effects and impact of projects. It is also necessary to improve both the present progress and the future planning of projects.

With regard to Indian T&V projects, Cernea and Tepping (1977) defined three zones of concentration for M&E. First, the visits of the VEW to the contact farmers. Second, the extent to which the recommended practices (impact points) conveyed by the VEW are adopted or not adopted. Third, the yields obtained by farmers in the project area.

Indicators are important for M&E. Cernea and Tepping (1977) provided a list of indicators for monitoring extension work, with particular reference to T&V. The indicators for monitoring include the degree of exposure to

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extension, quality of visits, farmers' evaluation of T&V, adoption of farm practices, role behaviour (VEWs, AEOs) and quality of training. For evaluation, the indicators are yields of major crops, cropping intensity and pattern (changes), area under HYVs, spread of key practices, amount of purchased inputs (fertilizers, pesticides) and credit use / recovery.

Data collection is carried out by means of questionnaires, field observations, in- depth case study, windscreen survey, staff records and official diaries. Most of the case studies describe sample surveys as the basic design for data gathering. Inexperienced enumerators and inadequate field supervision affect the reliability and quality of data. Training, lack of commitment to the exercise, and lack of familiarity with the purpose of the survey and the project often resulting from limited budgetary resources are factors that hinder efficient collection of reliable data. Critical constraint to data processing and analysis include: limited staff, with relatively limited analytical skills and experience; inadequate data processing equipment, uncertainty of requirement; and lack of user confidence in the database (Deboeck & Ng, 1980).

Sen (1987) noted that NGOs are not being self-critical of themselves. In general, self-evaluation is seen to be a non-priority area for NGOs for three reasons. First, there is little performance pressure on NGOs. If the clients are poor, they are unable to pay for their services and because the power equation between them and the NGOs is biased in favour of the NGOs, they are ineffective or not prone to the application of pressure on the NGOs. Second, the perspectives available for evaluation do not match the content in which

NGOs function. Third, the existing methodologies are not appropriate for the evaluation process to become institutionalized within the NGO.

To transform this situation a variety of mechanisms, perspectives, and processes exist that need to be adopted by the NGOs. However given the diversity of NGOs and types of programmes being implemented no unique solution exists.

Demographic and farm-related characteristics of farmers

This section reviews the characteristics of farmers, such as sex, age, social status, education, farming experience, size of farm enterprise and their influence on farmers' perception and acceptance of innovations.

Sex

United Nations observed that Africa's women have historically contributed much to the economic development of the continent, particularly in the agricultural sector. They are more than half of the adult population and one-third of the official labour force, performing two-thirds of the total working hours (as cited in Olorunnipa, 1993, p25). According to Olawoye (1993), rural men have traditionally been the recipients of most agricultural extension services. Therefore, in implementing their programmes, NGOs should focus more on women since they have been denied access to productive resources for a long time. This will help to improve their livelihood.

Age

La-Anyane (1985) reported the average age of farmers in Ghana to be between 50-60 years and this positively affects productivity and sustainability. In the view of Knowles (1980), as an individual matures he/she accumulates a reservoir of experience, broadening his/her base for relating and learning. Farmers have to learn during training sessions to increase their level of competency. Tauer (2000) found a relationship between agricultural production and age of the farmer. When farmers enter their mid- life they typically see an increase in productivity as they gain both experience and equity. At the age of 35 years, productivity begins to increase until it levels off. According to CIMMYT (1993), older farmers may have more experiences, resources or authority for trying a new technology while younger farmers are likely to adopt a new technology since they are more educated and more cosmopolite than the older generation.

Social status/position

Statuses are positions in the social order that indicate who we are in relation to others, and consequently play a key role in establishing social identity (Calhoun, Light, & Keller, 1994). In every community there are people with different statuses. The indices for determining status may differ from place to place. People with high social status are more likely to become aware of and accept new ideas earlier than those with low social status. Rogers and Shoemaker (1971) investigated the relationship between high social status and early adoption of an innovation and found that 275 such studies out of 402 studies gave a positive relationship, while 127 did not support the relationship.

People with high social status may not always be the innovators especially, if they do not perceive the innovation to be consistent with their felt needs, values and past experiences. According to Aklilu, farmers with higher social status and social participation are often very influential at the village level. They are the people who are considered as the opinion leaders (as cited in Byrnes, 1978, p.169). The inclusion of influential people in a programme tends to enhance the image of the programme and attracts the others. Consequently, they have a good chance of being selected.

Educational level

The level of education influences farmers' level of participation in agricultural programmes. Sukaryo (1983) found that better educated farmers can exploit wider range of information sources and raise their level of participation in agricultural programmes and adoption.

Farming experience

Experience in agricultural production is essential to success. Work experience in all the various aspect of farm or ranch operations enhances productivity (Bureau of Labour Statistics, 2002-03). Farming experience puts a farmer in a position to exercise greater influence and potential leadership in promoting change than others.

Size of farm enterprise

An individual's willingness to accept new ideas and agricultural programmes also depends on the size of enterprise. Those with small enterprise are less willing to try and less ready to accept new ideas. Van den

Ban (1960) found size of enterprise to be positively related to the acceptance of new ideas.

Perceived effects of NGO intervention on agriculture

The process of perception allows us to interpret things as objects, events and situations. Farmers, who are able to interpret their situation well, are equally capable of interpreting correctly the outcomes of interventions. Without the ability to organize and interpret sensations, life would appear meaningless. A person without any perceptual ability would not be able to recognize things, understand languages, and avoid threats. This situation of some farmers is an unfortunate one, since they may lack the understanding necessary to improve on their farm business or get rid of things that threaten the business. Their inability to avoid threats may be the result of their refusal of the means to do so. Such farmers would be content with the outcome, whatever it is, of their farm business.

Feldman (1990) stated that learning and experience clearly play a critical role in the development of perception. Hayes and Orrell (1992) also indicated that whenever we receive sensory information, we make sense out of them, both consciously and unconsciously, and this allows us to fit the new information in with other things we already know. Without learning (knowledge) we will misperceive things and their effects. For instance, without knowledge a farmer would be unable to use an innovation correctly. Similarly, farmers without normal basic experience could not perceive things accurately.

Cross-cultural studies have looked at people who have grown up in very different environments to see if there are differences in their perception.

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Following from these studies, cross-cultural psychologists asserted that people in different cultures have different daily experiences and consequently there should be differences in their perception of some objects and events (Zimbardo & Weber, 1997). The perception of the effects of interventions may, therefore, differ from culture to culture or environment to environment. The context in which an object appears may also make us perceive things differently. Nevertheless, there are many effects of NGOs interventions on agriculture.

Increased yields

Farmers expect good yields following interventions. Various studies show that yields of crops can actually increase with the use of appropriate technology. In experimental fields, yields up to 20 to 40 ton/ha of cassava are easily obtained, compared with a poor 8 to 9 ton/ha in farmers' fields, highlighting the unexploited potential for the production of cassava (IITA, 1989).

Table 1 indicates the normal yields of crops obtained in Ghana as well as yields that have been achieved in cases where more effective extension and use of recommended technologies have occurred (MoFA, 2002). According to Gomez (1986), technology is not the only factor that has resulted in increased rice yield. Other important factors are (1) the increasing areas with irrigation; (2) input – output price structure; and (3) weather. Anderson and Herdt (1989), however, appear pessimistic about the ability of current technologies to advance yield levels in the developing countries.

Table 1: Average yields of selected food crops under rain fed conditions in Ghana

Crop	Yield mt/ha	Achievable yield mt/ha
Cassava	11.8	28.0
Plantain	7.8	10.0
Yam	12.3	20.0
Cocoyam	7.0	8.0
Maize	1.5	5.0
Rice (paddy)	2.0	3.0
Cowpeas	0.75	2.0
Millet	0.9	2.0
Sorghum	1.1	2.0
Cocoa	0.39	1.0

Source: MoFA, 2002

Improved cultural and management practices

Cultural practices are important in crop production. They include sowing, weeding, fertilizer application, disease and pest control among others. Studies show that optimal sowing time, optimal timing and deadlines for plants by area, optimal age of seedlings, chemical weed control, chemical disease and pest control, irrigation technology contribute to greater productivity and lower costs (Silva, 1987).

Effective management of farm animals leads to maximum production. According to Akinyosoye (1984), animal production can be up-graded by improving the environment in which the animals are reared. Environmental factors that play a significant role include feeding, housing, pest and disease

prevention and control, and a high standard of husbandry. In an improved environment animals rapidly increase in health and productive capacity.

Increased income

Agricultural products are the main source of income for farmers in rural areas. The sale of farm produce rakes in income of varying amounts. Brandão and Carvalho (1991) reported that in 1981 both corn and soya bean growers in Brazil experienced a positive effect on income from direct intervention. However, the impact on the income of soya bean growers was usually negative. IFAD (2000) stressed that a significant impact on poverty reduction occurs when project interventions have benefits that go beyond the scope of the project. According to Gomez (1986), both landowners and landless labour have derived substantial benefits from the new technology in rice production in the Philippines. The benefits included increased employment and incomes.

Food security

Food security is defined as the economic and physical access to food by all people at all times. Where there is household food security, the family has access to safe and nutritious food to maintain a healthy and active life. Food security is life that is free of the risk of malnutrition and starvation. When people are hungry, then they are food insecure. Colecraft (1993) attributed the inability to attain food security to factors such as droughts and other natural disasters, the seasonal and perishable nature of many foods, climatic conditions that promote food spoilage, and inefficient food distribution methods. IFAD (2000) observed that interventions, such as

increasing the access of the poor to land and productive assets and services, are paramount for food security and income expansion.

Improved livelihood

The basic necessities of life such as food, clothing, shelter, security, freedom, basic literacy and health care are required by all. The health status of rural farmers, for instance is expected to improve through eating balanced diet and having money for medicine. Wagstaff and Claeson (2004), however, noted that people in the developing world do not receive the interventions that could save their life or make them well nourished. Consequently the low use of effective intervention translates into higher rates of mortality, morbidity and malnutrition. Landim (1987) noted that NGOs address living conditions of the target group and undertake projects to improve health care.

A major concern of many families today is finding a decent accommodation. Strow (1981) stated that any family will want a better place to live its life more conveniently, more comfortably, more healthfully and more enjoyably, if given some help. Habitat (1993) noted that lack of finance constituted the most important factor inhibiting the access of low-income Nigerians to decent housing.

Quality of produce

The market value of farm produce is a function of its quality. Consumers are generally more attracted to produce of high quality and are therefore willing to pay more for it. Poor quality of produce could be attributed to weed problems, pest infestation, diseases, low soil fertility, and malnutrition in farm animals. IITA (1990) reported that mechanical damage caused by *Imperata*

cylindrica provide entry points for fungi and other pathogens that cause tuber rot and reduce the quality of cassava tubers.

Working relationship

For effective work to be done by extension, there is a need for some form of partnership or agreement or working relationship with clients. According to Garilao (1987), an NGO survives as an institution because of a constituency. NGOs exist because of and for people. The constituency gives the organization its character, its support. In short, it derives its mandate from the people for which it works. It can be inferred that since the organization derives its mandate and support from the people a good working relationship need to be pursued for development to go on unhindered.

Both NGOs and clients must come to some form of agreement on working relationship to ensure effective collaboration. Even when agreements on working relationships are reached, the evidence shows that many are poorly grounded or so prescriptive as to overwhelm the flexibility that makes NGOs / CBOs attractive partners in the first place (Gibbs et al., 1999).

Close working relationships are clearly critical to project success. But unless these relationships are fully owned by both parties, they are unlikely to succeed. In a study carried out by World Bank Operations Evaluation Department to assess 37 projects with significant NGO / CBO involvement in five countries, it was found out that a satisfactory outcome appears to depend on effective working relationship with NGOs / CBOs, among others. Effective working relationships among partners were found in 16 of the 18 satisfactory projects. Gibbs et al. (1999) further reported that the relations between an NGO called IFFI (Institute de Formación Feminina Integral) and the Social

Investment Fund (SIF) in Bolivia were cordial, each acknowledging the others competence.

This brings out clearly an important factor in the establishment of a good working relationship. Where one feels the other is incompetent and lack the knowledge and skills that could contribute to their progress and welfare, the relationship tends to break down. Gibbs et al. (1999) noted that relations range from supportiveness to skepticism. They also found that constructive relationships often depend on creative individuals with previous link to the NGO community who carefully nurture new relationships with NGOs/ CBOs.

IFAD (2000) stressed that they forge partnerships with NGOs whose relationships with local communities are broad and deep; and there is a strong sense of mutual trust and respect. Gibbs et al. (1999) in support of this stated that it is vital for NGOs to maintain credibility with their clients. The most frequent fear of NGOs is that their clients will mistrust them if they are too close to government.

Relationships are built on trust .All relationships with farmers, NGOs and extension workers are based on the element of trust. Extension workers for instance, who hide information from their clients are not viewed as trust – worthy. Farmers would be more willing to deal with extension workers who keep their word and do what they promise. When the trust is there, clients would normally accept extension claims about ideas. It is therefore appropriate to build a trusting working relationship with clients.

Sometimes individuals have the tendency to control NGOs. An experienced NGO in Mali felt unhappy about the treatment given to it when it was contracted in two bank–supported projects to help rural communities

install wells in dry areas. It expected more flexible working relations, given the remote location, difficult physical conditions, and the task to mobilize communities to operate and maintain the wells (Gibbs et al., 1999).

Poor working relationships generally hurt extension projects. Much time and effort must be put into building a relationship with clients for successful project execution.

Concept of perception

Van den Ban and Hawkins (1996) defined perception as the process by which we receive information or stimuli from our environment and transform it into psychological awareness. According to Feldman (1990), perception is the sorting out, interpretation, analysis and integration of stimuli from our sensory organs. The senses are, therefore, important in interpreting the 'world'.

However, Gamble and Gamble (2002) pointed out that perception goes beyond the senses and that events that occur in the real world may be quite different from what is perceived. It means that different people may interpret the same events in different ways. There are general principles that underlie the concept of perception and these are relativity, selectivity, direction and cognitive style (Van den Ban & Hawkins, 1996).

According to Van den Ban and Hawkins (1996), our perceptions are relative rather than absolute. Although we may not be able to state the exact weight or surface area of an object, we may be able to tell whether it is heavier or lighter, larger or smaller than a similar object indicating that the perception of a message is influenced by its surroundings.

With regard to selectivity, Van den Ban and Hawkins (1996) claimed that the human nervous system cannot make sense of all the numerous stimuli it receives at any point in time. Hence, an individual pays attention only to a selection of these stimuli. We are particularly attentive to stimuli that appear exceptionally bright, large, loud, novel or high in contrast. We also pay greater attention to stimuli that are particularly meaningful or relevant to our own motivations (Whalen & Liberman, 1987; Posner & Presti, 1987).

Gamble and Gamble (2002) also noted that an individual selects only the experiences that reinforce existing attitudes, beliefs and values and tends to ignore those experiences that are inconsistent with the attitudes, beliefs and values of the individual. Past experiences and training influence our selectivity. Training provides a set of experiences that influence our perception.

According to Van den Ban and Hawkins (1996), our perceptions are organized. Normally, we organize our perception in some definite ways which enable us to make sense of the information around us in such a way as to make sense to us. Our senses organize things into figures against backgrounds. The background of a figure helps the perceiver to organize his/her senses to interpret what he/she sees. Another way we organize stimuli is termed 'closure', the tendency for a perceiver to close a figure that he/she perceives to be open or incomplete.

As regards direction, humans perceive what they expect or are 'set' to perceive. The mental sets influence what they select and how they organize and interpret it. 'Sets' may cause farmers to be superstitions and the extension agents must learn to understand these perceptions before attempting to change

the farmers. A communicator, for instance, must structure his/her message in a way that will reduce the number of alternative interpretations that could be given to it. Van den Ban and Hawkins (1996) pointed out that perceptual set could deter an audience from interpreting a situation in a new way.

According to Van den Ban and Hawkins (1996), an individual's perception will differ markedly from the perception of another person who is in the same situation because of differences in cognitive style. A communicator will find it impracticable designing messages to cater for the differences in cognitive styles among his/her audience. Hence, it is recommended that a strategy be adopted for presenting the same idea in a variety of ways that will appeal to most cognitive styles.

Conceptual framework

This section deals with a conceptual framework (Fig.1) used for the study on farmers' perception of NGO interventions on agriculture in Mfantsiman and KEEA municipalities of the Central Region of Ghana.

Generally, there are two key players in an extension service delivery system: the service provider and the client. The service provider carries out an intervention in a community through the provision of information or technologies or both. Various sources of information about an event or an object are integrated into an overall judgment (Franzio, 1996). In the light of the client's present condition, he/she decides to adopt or not to adopt the technology. This decision is greatly influenced by demographic and farm-related characteristics, namely; age, educational level, farm size, farming experience and social status.

Perceived Benefit	
High	Low

Real Benefit	
High	Low

PERCEPTION	
High	Low

Service input

Info
Sources
Training
Meetings
M&E

input
availability
cost

NGO

MoFA and other sources of extension services

Demographic and Farm-Related Characteristics of Farmers
Age, education, farm size, farming experience and social status.

CLIENT FARMER
Agricultural activities

ADOPTION

- - - - - - - - - - - - ▶ May or may not be part of the package

Fig. 1: Farmers' perception of NGO interventions on agriculture

Source: Author's Construct, 2006

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These social characteristics constitute the basis for the kind of perception formed. Experience and learning are both important in influencing perception. Studies by Turnbull in 1961 and Segall, Campbell and Herskowitz in 1963 revealed that our perception may be affected by our experience (as cited in Hayes & Orrell, 1992, pp.43, 44).

Wortman et al. (1992) pointed out that our expectations are moulded by learning and experience and these expectations shape our perceptions. Cross-cultural psychologists asserted that people in different cultures have different daily experiences and consequently there should be differences in their perception of some objects, events and, in this case, services provided by the NGOs (Zimbardo and Weber, 1997).

Figure 1 shows two main service providers: NGOs and MOFA. There is a level of interaction between them. It may be a direct interaction between officials of NGOs and MOFA or indirect interaction among NGO and MOFA officials and intermediaries. This interaction takes the form of collaboration, consultation and delegation (Marshall, 2004). The services provided by most NGOs include information and input. Clients would normally consider the source of information, type of information provided at training programmes and at meetings with service providers, availability and cost of inputs as well as interest rate on credit facilities to decide whether to participate in the NGO programme or not. Where inputs are not part of the package, farmers are free to obtain them from any reliable source. Some of the services usually made available to farmers are production inputs, storage and preservation inputs, marketing inputs, information and communication support.

As shown in Figure 1, some demographic and farm-related characteristics may enable the clients to make a decision for adoption or non-adoption. The characteristics include sex (Olawoye, 1993), age (Akinola, 1986; CIMMYT, 1993), social status (Rogers & Shoemaker, 1971), education (Chandri, 1968; Rogers, 1983), farm size (Feder & Slade, 1985), farming experience (Dankwa, 2002) and source of information (Williams & Williams, 1971). Marshall (2004) found significant relationships between farmer demographic variables such as sex, education, farm size, total number of crops and livestock and farmer perceived extension effectiveness of most agricultural technologies studied. Effectiveness in this context refers to adoption, availability and cost of inputs, relevance and adequacy of agricultural information or technology. The characteristics guide the farmer in perception formation. The outcome is premised on perceptions developed over a period of time (Zimbardo & Weber, 1997).

Once perception is formed about an intervention or a programme, a decision for adoption or non-adoption is made. When the services are perceived to be good, the output is likely to be perceived as favourable, hence adoption. A high perceived output may lead to adoption on a small or large scale. On the other hand, a negative perception of the services is likely to produce low perceived output. A low perceived output may result in low level of adoption particularly when the package is free or non-adoption. A significant relationship was found between output and the adoption of agricultural technology in the Central Region of Ghana (Marshall, 2004). An individual may not adopt the programmes because he/she does not see it as the best course of action.

As illustrated in Figure 1, the actual or real output subsequent to adoption may be high or low. If it is high, the perception of the client will increase. He/She will then contact the NGO for further assistance. As a result, the extension service delivery system is kept functional. A low perception resulting from a low actual output may result in discontinuance of the technology.

People's actions are mainly directed by their perceptions, which they often take as the truth even though they may be wrong. Scientific research work supported by facts may mean little to the ordinary farmer until he/she perceives the realities in his/her own senses. This is why it is important to find out what people feel about an intervention.

One limitation of perception study is the difficulty in getting the same results if the study is repeated. This is because people's perceptions change with exposure to new experiences. The outcome of the study can also be influenced by respondents whose perceptions are very far from objectivity, unless steps are taken to rectify this situation. Rural people tend to give information that is slanted or false because of fear, ignorance and other factors. The quality of the responses is, therefore, determined by their perceptions about the motives for involving them in the study. To improve on the quality of the responses, farmers must be adequately briefed on the purpose of the study.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the research methods and procedures that were used to generate data to explain farmers' perception of NGO intervention on agriculture. It begins with a brief description of the study area, profile of NGOs, research design, study population, sampling and sample size. This is followed by instrumentation, data collection, processing and analysis.

Study Area

The study was conducted in Mfantsiman and KEEA municipalities of the Central Region because multiple NGOs operate in each of the municipalities. The study area (made up of Mfantsiman and KEEA municipalities) is located in the southern part of Central Region (Figure 2). It covers a total land area of 1,531.95 sq.km. The two municipalities have a population of 264,435 (Ghana Statistical Service, 2000). Agriculture is the main source of livelihood. For each Municipality, emphasis is placed on the land area, boundaries with neighbouring districts, population and economic activities.

Mfantsiman Municipality

The Mfantsiman Municipality has Saltpond as its capital. Other major communities include: Essakyir, Dominase, Anomabu, Mankessim, Kormantse, Abandze, Otuam, Narkwa and Yamoransa.
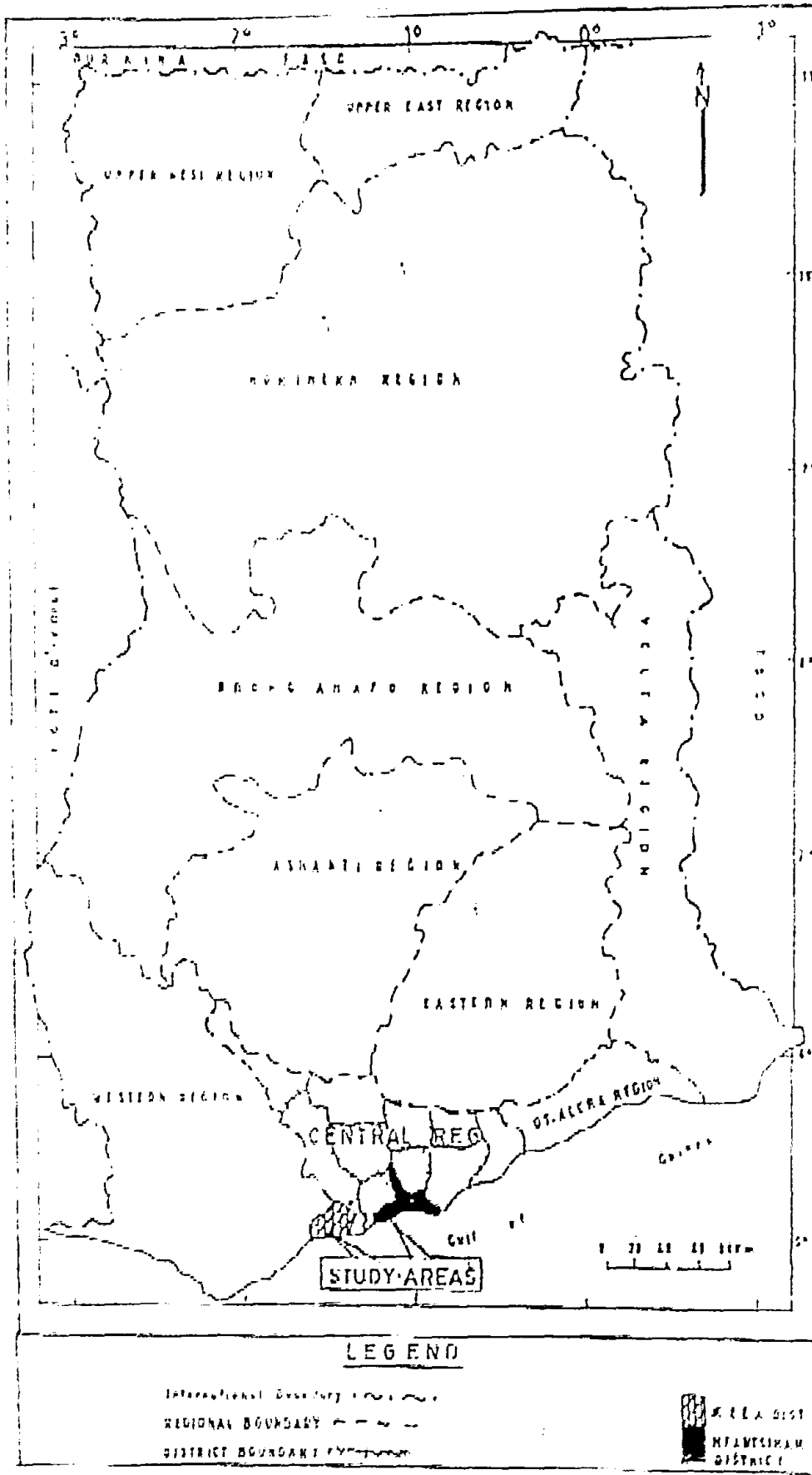
Fig. 2 Map of Ghana showing KEEA and Mfantsiman municipalities of the Central Region

The Municipality is bounded on the east by the Gomoa District, west by the Abura-Asebu-Kwamankese District, south by the Gulf of Guinea and north by the Assin and Ajumako-Enyan- Essiam districts. The Municipality covers a total land area of approximately 612 square kilometers.

The Municipality has a population of 152000 out of which 54 percent were females and 46 percent were males. Farmers and fishermen constitute about 60 percent of the economically active population (Ghana Statistical Service, 2000).

The active agricultural population is approximately 91,000. Of this, commercial farmers are approximately 0.3 percent and peasants are about 99.7 percent. Land holding is less than 1ha. The vegetation is mainly secondary forest with thicket and shrubs of an average height of 4.5m. The coastline is about 40km long. Temperatures range from 24^0C to 28^0C with relative humidity of about 70 percent. There are two seasons of rainfall with peaks in May-June and October. The total annual rainfall ranges between 90cm and 110cm along the coast and between 110cm to 160cm in the hinterland. The harmattan is experienced between November and February.

The available land for agriculture is about 49,000ha. Major crops cultivated are vegetables particularly pepper and garden eggs. Minor vegetables grown include okro, tomatoes and cabbage. Other crops cultivated are maize, cassava, plantain, pineapples and also citrus, oil palm, cocoa, sugarcane and cashew. Gari processing is undertaken in Taabosom. There are factories at Toboase, Odumanor and Akobima for processing palm fruits. The NGOs in the Municipality are Adventist Development and Relief Agency

(ADRA), World Vision International (WVI), International Association for the Advancement of Women in Africa (ASAWA) and Plan International.

Komenda-Edina-Eguafo-Abrem Municipality

The Municipality is located in the south-western part of Central Region. It shares boundaries with the Atlantic Ocean (Gulf of Guinea) to the south, Cape Coast Metropolis to the east, Twifo-Hemang Lower Denkyira District to the north and Shama-Ahanta East Metropolis and Mpohor-Wassa East District to the west. It consists of four traditional areas, namely: Komenda, Edina, Eguafo and Abrem. The Municipality has Elmina as its capital.

It has a land area of 919.95sq.km. The topography stretching from the coastal belt is almost a peneplane with rising hills some few kilometers away from the coast. Further hinterland, the land is undulating with several hills and valleys in between them. On the slope of the hills, the soils are sandy-clayey, while the valleys have gravely sandy colluviums. The drainage system is quite good with some few rivers, streams and lagoons.

The climate and vegetation are variable, being influenced more by rainfall than temperature. Rainfall occurs in two peaks. The annual rainfall is between 750mm and 1000mm at the coast, and it ranges from 1200mm to 1500mm in the interior. Temperatures are generally high. Relative humidity ranges between 85 percent and 99 percent in the mornings, declining to 50-85 percent in the afternoon. In the coastal areas, the vegetation consists of shrubs; in the interior secondary forests occur.

The Municipality has a population of 112,435. The sex ratio is 91.6 to 100 (Ghana Statistical Service, 2000). This represents 7.1 percent of the total population of the Central Region. About 86 percent of the total land area is

available as arable land. Farmers in the Municipality are mainly peasant farmers with average holdings of 2-3ha. Food crops cultivated are maize, cassava, yam, plantain, cocoyam and pineapple. Other crops grown are citrus, cocoa, oil palm and sugar cane. The NGOs in the Municipality are Adventist Development Relief Agency (ADRA), Central and Western Fishmongers Improvement Association (CEWEFIA) and Christian Rural Aid Network (CRAN).

Profile of target NGOs

This section gives a brief description of the NGOs studied with respect to their origin, and when they commenced operations in Ghana. The main areas of operation in agriculture in Ghana and the number of communities in which they support agriculture are also described.

Adventist Development and Relief Agency (ADRA)

Adventist Development and Relief Agency (ADRA) came to Ghana in 1984, after the drought and the abrupt return of more than a million Ghanaians expelled from Nigeria. ADRA is a major distributor of commodities that are used primarily for food- for- work (FFW) activities. It has projects in all the ten regions of the country in different sectors.

With FFW it has promoted tree- planting for community woodlots and intercropping in farms. It liaises with the Forestry Department for free seedlings for community woodlots and the communities pay for transport. ADRA has its own field staff who work directly with ADRA project committees (Rizika 1993). ADRA is playing a vital role in the development of

agriculture in Ghana. Some of the activities it undertakes include the following:

- Formation of farmer groups in selected communities.

- Provision of farm inputs to farmers. e.g.: cutlass, seeds, seedlings of cashew, cassia, citrus and fertilizers.

- Offering technical advice to farmers.

- Helping farmers to acquire processing machines.

- Helping farmers to construct cribs for storage of produce.

- Provision of market information on prices of farm produce in various parts of the country.

- Linking farmers to buyers of produce.

- Training of technical men.

World Vision International (WVI -- Ghana)

World Vision International is a Christian, relief and development agency with branches in over 90 countries. World Vision International commenced operations in Ghana in 1979. The major programmes or ministry areas being pursued in Ghana include the following:

- Education;

- Food and agriculture;

- Health and nutrition;

- Water and Sanitation;

- Gender and development activities;

- Micro-enterprise development; and

- Christian witness and leadership training.

The Food and agriculture programme is designed to improve the efficiency of farm production and the welfare of farmers. Consequently WVI provides credit facilities and technical assistance to farmers through its extension staff. Until 1986 the development efforts of WVI-Ghana were concentrated at the community level. Thereafter its focus shifted from the community to a cluster of communities in a geographical area under the Area Development Programme (ADP). As at 2001, Ghana had 18 ADPs spread throughout the ten regions of the country, divided into southern, central and northern areas. In 1988, WVI- Ghana started its relief and development activities in the region at Assin District, Twifo-Hemang Lower Denkyira District and Mfantsiman Municipality.

Association for the Advancement of Women in Africa (ASAWA)

This NGO was started in Ghana in 1998 with the objective of helping to develop human resource in the rural areas. Its activities include training of women in various income-generating activities. ASAWA assists women in the following:

- Fish smoking, processing and packaging;

- Gari processing;

- Mushroom cultivation;

- Pineapple cultivation; and

- Palm Oil processing.

It has an integrated rural human resource centre at Ekumfi Eyisam, Mfantsiman Municipality of the Central Region.

Central and Western Fishmongers Improvement Association (CEWEFIA)

This NGO was formed in March, 1990 after the displacement of 54 fishmongers whose mud ovens were destroyed during the rehabilitation of the Ghana Railway Corporation's Station in Sekondi in the Western Region of Ghana. The fishmongers were mobilized into a group, resettled and provided with a loan to improve upon their fish processing business. As a result of this initial success, the fishmongers in the Central Region invited the NGO to extend its technology to them. This was done and both groups worked together and exchanged ideas and experiences, hence the name Central and Western Fishmongers Improvement Association of Ghana.

It aims at improving the socio-economic status of the rural women, children and communities. This it plans to do by empowering rural women to improve upon their standard of living through sustainable integrated development projects and programmes.

CEWEFIA is currently assisting rural women in the following ways:

- Organising fishmongers into viable groups and co-operatives;
- Encouraging fishmongers to engage in improved fish processing by using energy efficient and environmentally friendly fish smoking technology;
- Increasing the fish processing capacity of the women;
- Increasing outcomes of the rural women and assuring food security in Ghana.
- Promotion of savings and micro-credit;
- Organising capacity building workshops;

- Promoting environmental management and protection (fuelwood plantation establishment);

- Promotion of functional literacy;

- Improving the nutritional status of rural women and children; and

- Improving the reproductive health among women and children.

So far, CEWEFIA has been able to organize rural women, mostly fishmongers and agro-processors, into eleven viable groups in Western and Central regions of Ghana.

Research design

The research design used in this study is a descriptive correlation survey. Kerlinger (1979) described this type of design as that directed towards determining the nature of a situation, as it exists at the time of investigation. Gay (1987) agreed on the view that descriptive research provides opportunities for researchers to gain reliable insight into the current status of a phenomenon with respect to variables or conditions in a situation.

The main purpose of a survey design is to describe the characteristics of a population. In essence, researchers want to find out how members of a population distribute themselves on one or two variables. As in other types of research, the population as a whole is rarely studied. Instead, a sample of respondents is carefully selected and the information they provide is used to describe some aspects or characteristics of the population from which the sample is part.

Study population

The main population for the study consisted of farmers and fishsmokers receiving support from NGOs and managers of NGOs in the Mfantsiman and KEEA municipalities of the Central Region.

Sampling and Sample Size

Sampling involves the process of selecting a portion of the population to represent the entire population (Amedahe, 2004). Researchers use different ways to determine the sample size based on a given confidence level of precision required (Israel, 1992). Researchers generally have the notion that the larger the sample size, the smaller the sampling error. However, they unanimously agree that this assertion holds only when the sample is randomly chosen. According to Best and Khan (1998: 17), "there is no fixed number or percentage of subjects that determines the size of an adequate sample". Sample size may depend on the nature of the population, the data to be collected, the type of analysis to be done and funds available for the study.

A combination of purposive and random sampling methods were used to select the farming municipalities, the NGOs, managers of NGOs and the farmers. The target farmers were selected using the stratified random sampling method. In the case of CEWEFIA, accidental sampling was used because the fishsmokers/fishmongers were not sedentary. As a result the total number of fishsmokers available was used for the study. With the stratified random sampling each individual in a stratum has an equal chance of being selected. One advantage of random sampling is that the likelihood of obtaining a representative sample is greater than any sampling method.

The following procedure was used to select the sample from each of the two municipalities. A list of the farmers in the various communities in the two municipalities was obtained from the NGOs. The population was stratified on the basis of sex. The farmers on the list were then given numbers.

A table of random numbers was used to draw a sample of farmers from a population of farmers on the list of the NGOs. The sharpened end of a pencil was placed on the list of random numbers and the number and name recorded. A proportional random sample of 323 farmers and fishsmokers made up of 181 farmers from the Mfantsiman Municipality and 142 farmers and fishsmokers from the KEEA Municipality were selected for the study. The difference in the sample size in the two municipalities was due to the higher number of NGOs in the Mfantsiman Municipality. Table 2 shows the sample size taken from each NGO

Table 2: Population and sample size of farmers and fishmongers/fish workers

Municipality	NGO	Farmers and fishmongers/fishworkers	
		Population	Sample Size
Mfantsiman	ADRA	300	115
	WVI	94	39
	ASAWA	69	27
KEEA	ADRA	300	119
	CEWEFIA	150	23
Total		913	323

Source: Field Survey, 2007

Purposive sampling method was used to select the municipalities, the NGOs, and project managers of the NGOs. According to Osuala, purposive sampling technique allows the picking of subjects who are likely to provide the right information for the study (as cited in Nabare, 2007, p.61). A project manager was selected for each NGO.

Sources of Data

The research employed both primary and secondary sources of data. The primary data collection techniques used were interviews, questionnaire administered to managers of the NGOs and personal contacts with officials of both MoFA and the NGOs. Secondary data were used to supplement the primary data. Secondary data sources included journals, books, conference proceedings, websites on the internet, theses and dissertations.

Instrumentation

Validated interview schedule and questionnaire were used as the instruments to collect data for this study (Appendices II and III). The interview schedule was used for farmers, while the questionnaire was administered to managers of NGOs. Both close-ended and open-ended items were used in the instruments. Each instrument had the items arranged based on the objectives of the study. The interview schedule was developed based on the operationalised variables of the study objectives as follows:

Objective 2: To describe the demographic and farm-related characteristics of farmers participating in NGO extension programmes. The interview schedule for farmers in the Mfantsiman and KEEA municipalities sought information on demographic and farm-related characteristics of the farmers. The question

items covered sex, age, level of education, agricultural enterprise, farming experience and social status / position. Close-ended questions were asked.

Objective 3: To determine the mode of operation of NGOs. The interview schedule focussed on the mode of operations of NGOs. The items included membership of NGOs programme, training of clients, technology transfer, agricultural information support, credit provision, input supply and monitoring and evaluation.

The respondents were asked to indicate how they became involved with the NGO's programme and their opinions about the following support services given by the NGOs: provision of credit (cash), input supply, training, technology transfer and agricultural information. The extent of monitoring and evaluation was ranked on a 5-point Likert scale ranging from 1 = Very low, 2 = Low, 3 = Average, 4 = High and 5 = Very high.

Objective 4: To examine the perceived extent to which NGO interventions in agriculture have affected agriculture. The interview schedule elicited information on the perceived effects of NGO interventions on agriculture. The items consisted of yield, income, quality of produce, food security, land preparation, weed control, use of fertilizers/ manures, housing of animals, livestock feeding, disease and pest control, storage and preservation, processing and marketing. These items were measured on a 5-point Likert scale ranging from 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good and 5 = Excellent.

Objective 5: To examine the perceived effects of NGOs interventions on livelihood of farmers. Respondents were to indicate 'Yes', 'No', 'Don't know' to items relating to their ability to pay school fees, ability to pay for family's

health, ability to provide good clothing, ability to provide the family with more food and ability to provide decent house.

Objective 6: To examine the relationship between the variables in the study.

Objective 7: To compare farmers' perceived effect of NGOs interventions in the Mfantsiman Municipality and KEEA Municipality. The items were measured on a 5-point Likert scale ranging from 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good and 5 = Excellent.

Objective 8: To compare male and female farmers' perceived effect of NGO interventions on agriculture. These items were measured on a 5-point Likert scale ranging from 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good and 5 = Excellent.

Objective 9: The interview schedule for farmers sought to examine the working relationship between farmers and NGOs. The items were close-ended.

Questionnaires were used to collect data from the managers of NGOs in the Mfantsiman and KEEA municipalities. The questionnaire sought information on the characteristics and mode of operation of the NGOs, perception of the effects of NGO interventions on agriculture, and lastly the working relationship with clients. Respondents were asked to provide the following information:

1. Characteristics of NGOs

2. Procedures and factors used in selecting clients

3. Mode of their operations:

- Adequacy and relevance of service

- Provision of credit (cash)

- Input supply

- Training

- Technology transfer

- Agricultural information support

- Monitoring and Evaluation activities: This was measured on a 5-point Likert scale ranging from 1 = Very low, 2 = Low, 3 = Average, 4 = High and 5 = Very high.

5. Perception of the effects of NGO interventions on agriculture. This was also measured on a 5-point Likert scale ranging from 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good and 5 = Excellent.

6. Working relationship

Both closed-ended and open-ended items were used. The open-ended questions were to elicit more detailed responses to certain specific activities of the NGOs and how these affected the production.

Validity of instruments

To ensure that the instruments measured what they were intended to measure, the validity was established. Both face and content validity were ensured. Face validity was ensured by the researcher while content validity of the research instrument was ascertained by the supervisors and a lecturer at the Department of Agricultural Economics and Extension of the University of Cape Coaşt, a colleague, ADRA and MOFA staff. They scrutinized the instruments to determine the appropriateness, adequacy and comprehensiveness. The feedbacks were used to modify the instruments.

Pre-test

A pre-test using the instruments developed was conducted in the Twifo-Hemang Lower Denkyira District of the Central Region. The purpose of the pre- test was to detect deficiencies, weaknesses and ambiguities in the instruments for correction and modifications to be made. The exercise was to help improve the internal consistency of the instrument.

Twenty farmers and a manager of WVI were selected for the pre-test. The data collected from the pre-test for some sub-scales were entered into the Statistical Product for Service Solutions (SPSS version 12.0) data file to determine the reliability. The Cronbach's Alpha Reliability coefficients for the sub-scales, cost of inputs, farmers' perception of the effects of NGO intervention on agricultural activities and monitoring and evaluation were 0.8682, 0.8294 and 0.7794 respectively. These values implied that statements on the sub-scales were internally consistent. The instrument was used after it was judged to be internally consistent.

Data collection

To facilitate data collection, a letter from the Department of Agricultural Economics and Extension of the University of Cape Coast introducing the researcher was sent to the various NGOs selected for the study. Further contacts, where necessary, were made with the managers to explain the nature of the research and to seek their support for data collection.

Field data collection was carried out by eight trained assistants, four from each Municipality from April to June, 2007. The farmers were interviewed individually in the local dialect on a face-to-face basis using the interview schedule. The purpose of the study was explained to the farmers and

they were also assured of confidentiality of responses provided. During the interview, the farmers' responses were ticked or written on the schedule. After the interview, the responses were edited to correct mistakes in the recording. The validated and pre-tested questionnaires were administered to the managers of the NGOs. By September 2008, all the completed questionnaires had been received from the managers.

Data processing and analysis

The data collected from the clients were processed as follows:

- Preparation of a code file to direct the transformation of variable categories into numbers for entry into a computer.

- Editing to ensure that collected data were meaningful.

- Entering of data into a computer.

- Data cleaning.

The Statistical Product and Service Solutions (SPSS version 12.0) was used for data analysis. Statistical tools used for the analysis included frequency and percentages to summarise data (Objective 2).

For Objective 3, frequencies, percentages, means and standard deviations were used to describe the mode of operations of the NGOs.

Also, frequencies, percentages, means and standard deviations were used to describe the level of farmers' performance before and after the intervention. Dependent (paired) sample t-test was used to determine the extent to which NGO interventions have affected agriculture (Objective 4).

Frequencies and percentages were used to examine the perceived effect of NGO interventions on the livelihood of farmers (Objective 5).

Pearson Moment Correlation Co-efficient (r) was used to determine the relationship between the variables and to determine the strength and direction of the relationship (Objective 6).

Furthermore, means and standard deviations were used to describe the farmers' perceived effect of NGO interventions in the Mfantsiman and KEEA municipalities, whereas the independent sample t-test was used to determine whether significant difference existed between farmers' perceived effects of NGOs interventions in the two municipalities (Objective 7).

For objective 8, means and standard deviations were used to describe male and female farmers' perceived effects of the intervention, whereas the independent sample t-test was used to determine whether significant differences existed between male and female farmers' perceived effects of the intervention.

In addition, descriptive statistics, such as frequency, percentage, means and standard deviations were computed to summarise and describe the general trend of the data on questions relating to working relationship (Objective 9).

Table 3: Summary of statistical tools for analysis of objectives

Specific Objective	Statistical Tool used for Analysis
Two	Frequencies, percentages
Three	Frequencies, Percentages, Means, Standard deviation
Four	Frequencies, Percentages, Means, Standard deviations, Dependent (paired) sample t-test.
Five	Frequencies and Percentages
Six	Pearson Product Moment Correlation Co-efficient
Seven	Means, Standard deviations, Independent sample t-test
Eight	Means, Standard deviations, Independent sample t-test
Nine	Frequencies, Percentages, Means, Standard deviations

Source: Field Survey, 2007

CHAPTER FOUR

RESULTS AND DISCUSSION

General overview

This chapter discusses the results and major findings of the study. The data are discussed based on the objectives of the study. It begins with a description of NGOs in the Mfantsiman and KEEA municipalities of the Central Region, followed by the demographic characteristics of farmers, mode of operation of NGOs and farmers' perceptions of the effects of NGO interventions on agriculture. Other items include the relationship between the variables, a comparison of the perception of farmers in the two municipalities and also between male and female farmers. Lastly, the working relationship between service providers and farmers is discussed.

NGOs in agriculture in Mfantsiman and KEEA municipalities

Four NGOs, namely ADRA, WVI, ASAWA and CEWEFIA were identified to be involved in agriculture in the two municipalities. The results indicated that ADRA and WVI were foreign NGOs while CEWEFIA and ASAWA were local NGOs. Whereas ADRA and WVI were religious, ASAWA and CEWEFIA were secular. ADRA started operating in Ghana in 1985 and in the Central Region in 1996. WVI came to Ghana much earlier than ADRA and began its activities in 1979. By 1981 it had made in-roads into Central Region. ASAWA started operating in Ghana and in the Central Region in 1985. Out of the four NGOs studied, the last, to come on the scene

in Ghana was CEWEFIA. It started its activities in Ghana and in the Central Region in 1990 and 1993 respectively.

Table 4 shows the various NGOs in agriculture in Mfantsiman and KEEA municipalities, the number of communities in which they support agriculture and the agricultural enterprises they support.

Table 4: NGOs in agriculture in Mfantsiman and KEEA municipalities

Municipality	NGO	No. of NGO communities per Municipality	Agricultural Enterprise
Mfantsiman	ADRA	44	Crop production (e.g. citrus, cashew, woodlot).
	WVI	7	Crop production, Animal production, Apiculture, Marine fishing
	ASAWA	12	Crop production (e.g. maize, vegetable), Palm oil extraction, Fish processing, Mushroom cultivation.
KEEA	ADRA	21	Crop production (e.g. citrus, cashew),
	CEWEFIA	7	woodlot Fish processing Afforestation.

Source: Survey Data, 2007

Apart from ADRA which carries out its operations in 44 and 21 communities in the Mfantsiman and KEEA municipalities respectively, the remaining NGOs operate in 7 or 12 communities. The main agricultural enterprises of the NGOs comprised crop production and processing, animal production, agriculture, fish processing, agro-forestry and mushroom cultivation.

Demographic and farm-related characteristics of farmers

This section gives an overview of the demographic and farm-related characteristics of farmers namely sex, age, status/position in the community, educational level, farming experience, type of agricultural enterprise and size of enterprise.

Sex

About 47 percent of the farmers selected for the study were male as shown in Figure 3.
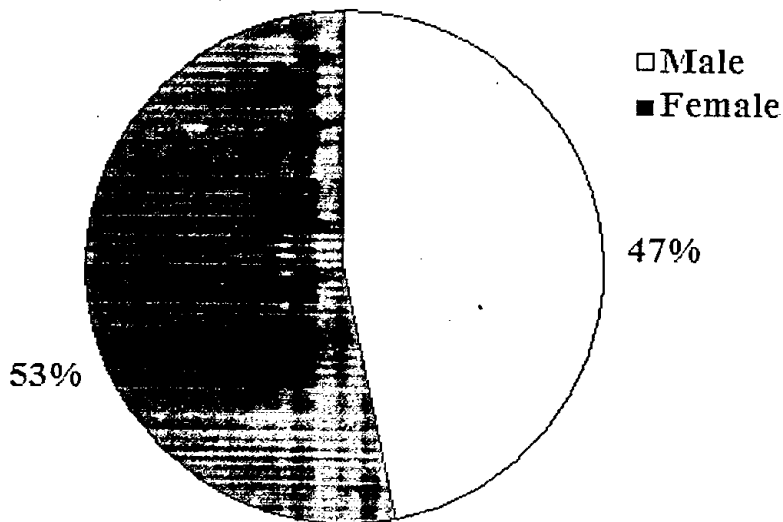
Fig. 3: Sex of the farmers

Source: Survey Data, 2007

This finding does not agree with the usual observation that more males than females engage in farming. For instance, a survey conducted by Marshall (2004) revealed 58 percent males and 42 percent females; another survey by Kumi (2003) showed that 55 percent of the respondents were males and 45 percent were females. Olawoye (1993) also pointed out that men have more access and control over production resources, decision-making and extension services than women. Buvinic and Mehra (1990), however, found that women are generally more active in growing food for subsistence, in weeding, post-harvest storage and processing, hauling small-scale marketing of agricultural produce and the care of livestock.

It is not surprising that the female population in this study was higher than the male population. In terms of sex ratio it was 88 males to 100 females. The same sex ratio was reported for the two municipalities during the 2000 population census (Ghana Statistical Service, 2000).

Age

As illustrated in Table 5, out of 323 clients, five did not provide responses. Only a few (5.7%) of the farmers and fishmongers were 20–29 years old. It has been found that younger people were more receptive to change and willing to accept risks. Rogers (1961) found younger age to be associated with innovativeness.

Table 5: Age distribution of farmers and fishmongers

Age Group (years)	Frequency	Percent
20 – 29	18	5.7
30 – 39	96	30.2
40 – 49	105	33.0
50 - 59	65	20.4
> 59	34	10.7
Total	318	100.0

n = 323   Five clients did not provide responses

Source: Survey Data, 2007

About 64 percent of the farmers and fishmongers were at least 40 years old. Knowles (1980) contended that as an individual matures, he/she accumulates a reservoir of experience, broadening his/her base for relating and learning. This would enhance participation in programmes. Eday (1980) also reported that young farmers have the physical strength for work and are more dynamic.

About 11 percent of the farmers and fishmongers are 60 years and above. This does not augur well for agriculture in the two municipalities, since the farmers have diminished vitality and productivity. There is, however, a relationship between age and adoption of new practices. According to CIMMYT (1993), older farmers may have more experiences, resources or authority for trying a new technology while younger farmers are likely to adopt a new technology since they are more educated and more cosmopolite than the older generation. The results also show that in the next 10 – 20 years the older farmers would have to be replaced by younger farmers.

Social status/position

The results reveal that the majority (71%) of participating farmers did not hold any leadership position in their communities. Farmers who were leaders constituted only 29 percent (Figure 4). This may imply that the service providers did not emphasise social status in the choice of farmers that could participate in the programme. The results of this study contrast Andrews' (2003) finding that the majority (56.7%) of the farmers held leadership positions in the communities. According to him group leadership is not a factor of the adoption of innovations in the Greater Accra Region.
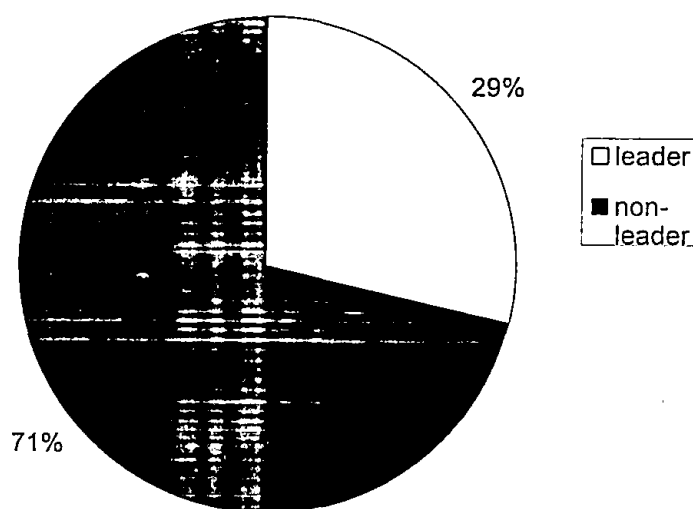
Fig. 4: Status of the farmers

Source: Survey Data, 2007

Educational level

Table 6 shows that out of 323 farmers, five did not provide responses. About 39.3 percent of the farmers were illiterates while 60.7 percent had formal education. Marshall (2004) found a lower rate of illiteracy (31.3%) in

100

the Central Region. The high rate of illiteracy in the study areas could affect the ability of farmers to receive and understand agricultural information. Byrnes and Byrnes (1978) asserted that for a person to be able to receive, decode and understand information processing and interpretation for the performance of jobs, then he/she needs education. Griliches (1964) noted that schooling is an important factor in making gains in agricultural productivity. Blakemore and Cooksey (1980) also recognized education as a key to occupational success.

As illustrated in Table 6, about 48 percent of the respondents had education up to Junior Secondary School or Middle School. This level of education is generally low. This low level of education might explain the low levels of farm output and adoption of technologies. Only 2.5 percent of the respondents had secondary or tertiary education. The results show that highly educated people do not engage in farming.

Table 6: Distribution of farmers by educational level

Educational level	Frequency	Percent
No formal education	125	39.3
Primary	33	10.4
JSS/Middle	152	47.8
Secondary/Technical	5	1.6
Tertiary	3	0.9
Total	318	100.0

n = 323   Five clients did not provide responses

Source: Survey Data, 2007

This may be explained by the fact that they do not find farming attractive and profitable. Besides, they do not want to reside in the rural areas, where agriculture is mainly undertaken, since these areas lack basic amenities. For any meaningful and drastic improvement in agriculture higher education is recommended. Ogunfitidimi observed that farmers with higher educational level understand the importance, intricacies and need for adopting improved farm practices (as cited by Marshall, 2004, p.45). Sukaryo (1983) also found that better educated farmers can exploit wider range of information sources and raise their level of participation in agricultural programmes.

Farming experience

Results from the study show that 23.2 percent of the farmers had less than 5 years of farming experience followed by 15.9 percent who had farmed for 5 – 9 years (Table 7).

Table 7: Distribution of farmers by farming experience

Years of experience	Frequency	Percent	Cum. %
<5	73	23.2	23.2
5 – 9	50	15.9	39.0
10 – 14	45	14.3	53.3
15 – 19	36	11.4	64.8
20 – 24	41	13.0	77.8
25 – 29	24	7.6	85.4
>30	46	14.6	100.0
Total	315	100.0	

n = 323

Source: Survey Data, 2007

About 61percent of the farmers had 10 years or more experience in farming. This implies that respondents were quite experienced in terms of number of years they had engaged in farming. Dankwa (2002) found that the majority (80.7%) of the farmers in his survey had worked between 10 and 40 years and these many years of experience led to the adoption of farm technologies. It is also likely that productivity of the farms would be high, all things being equal.

Type of enterprise

Results as shown in Table 8 reveal that the farmers were involved in different enterprises. The majority (75.5%) of the farmers were engaged in crop production, 13.6 percent in agro-forestry and 5.9 percent in fish processing. Only a few farmers were engaged in crop processing, animal production and animal processing. The large proportion of farmers cultivating crops is not surprising, since according to MoFA (2002) crops account for 64 percent of the agricultural Gross Domestic Product in Ghana. Farmers who perceive crop production to be profitable are more likely to adopt this type of enterprise and thereby increase the production of the major food and cash crops.

Table 8: Enterprises undertaken by farmers

Enterprise	Frequency	Percent
Crop production	244	75.5
Agro-Forestry	44	13.6
Fish processing	19	5.9
Crop processing	6	1.9
Animal production	6	1.9
Animal processing	4	1.2
Total	323	100.0

n = 323 (multiple responses)

Source: Survey Data, 2007

Animal production in the Mfantsiman and KEEA municipalities

Animal production in the study area was carried out by some WVI farmers. The main animals kept by the farmers with the support of WVI were goats, sheep, pigs and bees. Figure 5 shows that 50 percent of the farmers raised goat, 33.3 percent reared sheep, 16.7 percent reared pigs while 16.7 percent kept bees. The results also reveal that only a few farmers were engaged in animal production.

Marshall (2004) survey in the Central Region showed that fewer farmers reared goats (34.7%), sheep (25.3%) and pigs (4.3%) and no farmer from his sample kept bees. The results clearly show that animal production is not popular with the farmers as far as the NGO intervention is concerned. The relatively few farmers in animal production in the study area implies that the increases required in the levels of animal protein production especially for home consumption cannot be met. Therefore it is important for NGOs and for

the government and its relevant agencies to promote animal production wherever possible.
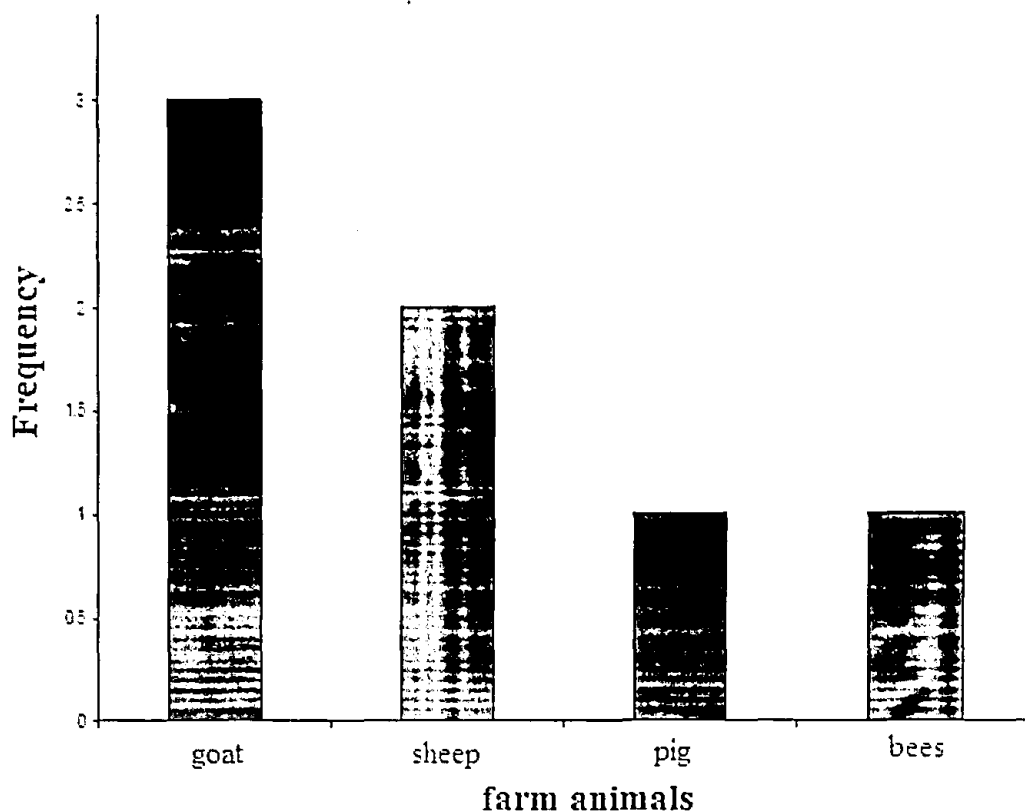
Fig. 5: Animal production in the study municipalities

Source: Survey Data, 2007

Crop production in the Mfantsiman and KEEA municipalities

As shown in Table 9, the most widely grown crops were citrus (28.2%) and maize (25.1%). This underscores the value of citrus and maize in our socio-economic setting. Citrus is a popular fruit crop which is consumed throughout the country. Marshall (2004) reported that 32.7 percent of farmers in the Central region cultivated citrus, while Dankwa (2004) found that a much lower proportion of farmers (8.4%) cultivated citrus in the Ashanti Region. Maize is a major crop in the two study municipalities. Available statistics from MoFA (2004) ranked maize as the second most important crop

produced in both municipalities, cassava being the first. It is also the most important cereal in Ghana in terms of human demand and supply (MoFA, 2003). Marshall (2004) reported that the majority (96.7%) of the farmers in the Central Region cultivated maize.

Table 9: Distribution of farmers by crops cultivated

Crop	Frequency	Percent
Citrus	91	28.2
Maize	81	25.1
Cassia	42	13.0
Pineapple	36	11.1
Cashew	22	6.8
Cassava	15	4.6
Vegetables	5	1.5
Oil palm	1	0.3

n = 294 (multiple responses)

Source: Survey Data, 2007

This proportion of farmers is much larger than that obtained in this study. The farmers who grew cassia and pineapple were 13.0 percent and 11.1 percent respectively. Less than 7 percent of farmers cultivated each of the following crops: cashew, cassava, vegetables and oil palm.

Size of enterprise

The following section presents results of the sizes of respondents' enterprises. It includes the size of crop production enterprise, number of animals kept by the farmers and the quantity of produce processed.

Size of crop production enterprise

The size of farmers' enterprises was investigated in the study. The results are presented in Table 10. The results from the table indicate that 88.2 percent of the farmers interviewed had 5 or less hectares of total farm size under cultivation. About 57 percent of the farmers cultivated 2 – 5 ha and 31.1 percent cultivated less than 2ha. This is a significant departure from the findings of Orhin (2003) who reported that 80.8 percent of the farmers in the Central Region had cashew farm sizes below 5 acres (2ha). Most of the farmers own two or more hectares of cultivated land as shown in Table 10. This implies that the acquisition of sizeable land for farming may not be difficult in the study area. Also, the size of land owned by the farmers suggests that many of them are engaged in commercial crop production. Only 0.3 percent of farmers cultivated more than 15ha.

Table 10: Distribution of farmers by size of crop production enterprise

Size	Frequency	Percent	Cum. %
<2ha	90	31.1	31.1
2 – 5ha	165	57.1	88.2
6 – 10ha	31	10.7	99.0
11 – 15ha	2	0.7	99.7
16 – 20ha	1	0.3	100.0
Total	289	100.0	

Source: Survey Data, 2007

It is estimated that about 31 percent of the farm holdings are less than 1.6 ha while only 18 percent are more than 4.0ha per farmer in Ghana (MoFA, 2003).

Number of animals kept by the farmers

The number of animals kept by the farmers was used as a measure of the size of enterprise. The results in Table 11 show that only a few animals were kept by the farmers in the study area. The majority (60%) of the farmers kept 1-9 small ruminants implying that the scale of animal production was generally low. The results appear to collaborate Dankwa's (2004) findings that a majority of the farmers in Ashanti Region reared 1-10 sheep (17.9%) and 1-10 goats (17.2%). The worrying aspect of the whole programme is that it has not promoted animal production to any appreciable degree. The implication is that animal protein is likely to remain scarce and expensive.

Table 11: Distribution of farmers by number of animals kept

Number of animals	Frequency	Percent
<5	1	20.0
5 – 9	2	40.0
10 – 14	1	20.0
20 – 24	1	20.0
Total	5	100.0

n = 6

Source: Survey Data, 2007

Quantity of produce processed

The quantity of produce processed by the respondents per day during the peak season was used as a measure of the size of enterprise. The findings in Table 12 indicate that 50 percent of the farmers processed 5 – 9 bags/crates, while 37.5 percent processed 10 – 14 bags/crates per day during the peak season. All the respondents reported that they processed less than 5 bags/crates of produce during the lean season. The respondents processed less produce during the lean season, suggesting that they are less busy during the lean season.

The results show that comparatively lower quantities of produce were processed compared to Buadi's (1992) findings at Tema U compound where the respondents claimed that they processed at least 50 crates/day (29%) during the main season and less than 10 crates/day (33%) during the lean season. The small quantities of produce processed during the main and lean seasons by the clients in this study indicate that their enterprises are small in scale.

Table 12: Distribution of farmers by quantity of produce processed per day during the peak season

Quantity processed	Frequency	Percent
<5 bags/crates	1	4.2
5 – 9	12	50.0
10 – 14	9	37.5
15 – 19	1	4.2
20 – 24	1	4.2
Total	24	100.0

n = 29

Source: Survey Data 2007

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William et al. (1984) also reported that the larger the farm business in terms of acreage or size of particular enterprise and the more specialised the nature of the farm business, the earlier the farmer tends to adopt new and improved practices.

Mode of operation of NGOs

The mode of operations of NGOs in the Mfantsiman and KEEA municipalities covered the membership of clients in the programme, training, technology transfer, agricultural information support, provision of credit and input, as well as monitoring and evaluation.

Membership in NGOs programme

The farmers in the study were asked to indicate how they became involved with the NGOs programme. As presented in Table 13, 32.5 percent of the farmers indicated that they became part of the programme through friends, followed by MOFA (29.1%) and ADRA (14.2%). The most important means by which the farmers got involved with the NGOs programme was through friends and MoFA agents. The proportion (23%) of the farmers that got involved through the three NGOs (ADRA, World Vision and ASAWA) is less than the percentage of the farmers that got involved with the programme through either friends or MoFA. This implies that friends and MoFA agents have much more influence in the study area than the NGOs and their influence should be utilized by the NGOs to attract farmers to their programmes.

The results as shown in Table 13 indicate that radio (0.3%) was not an effective means of getting the farmers involved with the programme. It is likely that the NGOs did not properly advertise the programme on the radio to

attract the farmers. It is also likely that the farmers were not convinced because the message lacked details and the opportunity for feedback.

Table 13: Distribution of Farmers by means of involvement with NGO programmes

Means of involvement	Frequency	Percent
Friends	98	32.5
MOFA	88	29.1
ADRA	43	14.2
Gong gong	32	10.6
World Vision	18	6.0
Relative	13	4.0
ASAWA	9	3.0
Radio Programme	1	0.3
Total	302	100.0

n = 323

Source: Survey Data, 2007

Selection of clients

The managers of the NGOs were asked to indicate the procedure used for the selection of their clients. The results are presented in Table 14. All the five managers stated that they made personal contacts with the farmers, the local chiefs and MOFA staff to decide on who to select for the programme. Four out of the five managers relied on opinion leaders to assist in the selection of clients. The results show that NGOs depend on various members of the communities for adequate information upon which decisions for the

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selection of a particular client could be based. The consultations with notable people in the communities would likely provide reliable and credible information about the farmers.

Table 14: Procedure for selection of clients

Procedure	Percent
Personal contact	100.0
Contact with chiefs	100.0
Contact with MOFA staff	100.0
Contact with opinion leaders	80.0
Contact with co-operatives	40.0
Contact with Farmers' Assoc.	60.0
Information from the community	60.0

n = 5 (multiple responses)

Source: Survey Data, 2007

Table 15 shows the factors that the managers of the NGOs considered in the selection of their clients. All the NGOs based the selection of clients on their expressed need implying that the farmers with expressed need were likely to co-operate with the NGOs to make the programme effective. Farmers who could better project their needs were more likely to be selected. Four out of the five managers representing 80 percent of the managers also indicated gender, farm enterprise, poverty status, ability to work hard and ability to work with a group as factors considered in selecting the clients.

Table 15: Factors NGOs used to select farmers

Factors	Percent
Expressed need	100.0
Gender	80.0
Farm enterprise	80.0
Poverty status	80.0
Ability to work hard	80.0
Ability to work with a group	80.0
Credit worthiness	60.0
Ownership of land	60.0
Status/Position	40.0
Farm experience	40.0
Membership of farmers/business Organization	40.0

n= 5 (multiple responses)

Source: Survey Data, 2007

The emphasis on sex in the selection of clients may also help to explain why there were more females than males in the research (Figure 3). The service providers did not consider educational status in the selection of clients. The non-consideration of educational status in the selection of clients may explain why a substantial proportion of the clients in the study were illiterates (Table 6).

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Type of service

A variety of support services was provided by the NGOs to enable the farmers carry out their agricultural activities successfully. The distribution of farmers by the services received is shown in Table 16. About 97 percent of the farmers had training. Training provides knowledge and skills and brings about desired changes in attitudes in order to improve the competency of people being trained (Kwarteng, 1995). As reported by Halim and Ali (1997), training is concerned with activities that are designed to improve human performance on the job. Training would therefore make the programme effective.

Table 16: Distribution of farmers by services received from NGOs

Service	Yes		No	
	Freq.	Percent	Freq.	Percent
Training	309	96.6	11	3.4
Agric Information Support	244	77.2	72	22.8
Input	243	76.4	75	23.6
Technology Transfer	188	61.0	120	39.0
Credit (cash)	77	24.2	241	75.8

n = 323 (multiple responses)

Source: Survey Data, 2007

More than three-quarters of the farmers received agricultural information (77.2%), and inputs (76.4%). With respect to technology transfer, 61 percent of farmers reported that they benefited from it. Only few (24.2%) of the farmers received credit in the form of cash. This implies that most of the farmers have to rely on own savings or other sources of credit. Where other sources have to

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be approached the interest rate or terms of repayment may adversely affect the farm business. Kohls and Uhl (1986) reported that training and transfer of improved technologies without financial support will not allow the small holder farmer to reap the benefits of acquired improved technology. Therefore these three services, training, transfer of technology and financial support must go together to improve the welfare of the farmer.

Adequacy of service

The farmers were also asked to indicate their perceptions about the adequacy of the support services for their agricultural activities. Table 17 presents the frequencies and percentages of farmers' perceptions about the adequacy of the services.

Table 17: Farmers' perceptions about adequacy of services provided by NGOs

Service	N	1	2	3	4	5
		%	%	%	%	%
Training	307	3.9	30.9	31.9	30.9	2.3
Agric Information	243	4.1	30.9	33.7	23.9	7.4
Input	240	6.7	17.9	31.3	31.3	12.9
Technology Transfer	197	15.2	22.8	22.8	34.0	5.1
Credit (cash)	73	12.8	46.6	35.6	5.5	-

n = 323 (multiple responses)

Scale : 1 = not adequate   2= fairly adequate   3= adequate   4= very adequate 5= excellent

Source: Survey Data, 2007

Approximately 32 percent of the farmers perceived training provided by the NGOs to be 'adequate'. Farmers need training for proficiency. Hurley (1990) pointed out that training provides the skill to enable people improve their work.

With respect to the other services, 82 of the farmers representing 31.3 percent believed input was 'adequate' compared to 33.7 percent of farmers who believed agricultural information was 'adequate' or 'very adequate'. Technology transfer and credit were both rated by the farmers as 'very adequate' (34.0%) and 'fairly adequate' (46.6%) respectively. A range of about 6 percent to 34 percent of the farmers perceived the services to be at least 'very adequate' while a range of 3.9 percent to 15.2 percent of the farmers believed the services were 'not adequate'. Commenting on the impact of inadequate inputs on adoption, Savale indicated that non-availability and inadequacy of supply and untimely nature of supplies affected adoption to a great extent (as cited in Byrnes, 1978, p.80).

The means and standard deviations of the levels of adequacy of various services rendered by the NGOs are presented in Table 18. The means for the services ranged from 2.34 to 3.26. The farmers rated as 'adequate' agricultural information (mean = 3.26, s.d = 1.10), input (mean 3.00, s.d. = 1.01), training (mean = 2.97, s.d = 0.93) and technology transfer (mean = 2.91, s.d = 1.17). The result is also consistent with Orhin's (2003) survey done in the Central Region where the farmers perceived farm inputs and agricultural information to be adequate. However, the rating for credit (cash) was only 'fairly adequate' (mean = 2.34, s.d = 0.77).

The result confirms Nebere's (2007) finding that the loan size for farmers was insufficient to increase their capital base. The farmers indicated that most of their raw materials were expensive and they therefore required adequate funds to develop their enterprises. The overall mean of the level of adequacy of the services was 2.91 with standard deviation of 0.88. The farmers generally agreed that the level of services was 'adequate'. This implies that, all things being equal, the farmers should be more productive than before. The low standard deviation indicates that the farmers were uniform in their opinion on the level of services received from the NGOs.

Table 18: Means and standard deviations of farmers' perceptions about adequacy of service provided by NGOs

Service	N	Mean	s.d.
Agric information	247	3.26	1.11
Input	243	3.00	1.11
Training	317	2.97	0.93
Technology transfer	197	2.91	1.17
Credit (cash)	73	2.34	1.17
Overall mean		2.91	1.88

n = 329 (multiple responses)

Scale: 1 = Not adequate   2 = Fairly adequate   3 = Adequate

4 = Very adequate 5 = Excellent

Source: Survey data, 2007

The means and standard deviations of the managers' perceptions about the adequacy of the services are shown in Table 19. The means ranged from 2.40 to 3.40. The managers rated the levels of training, input supply, technology transfer and agricultural information as 'adequate' and credit as 'fairly adequate'. This trend was confirmed by the farmers except that farmers gave the highest mean value to agricultural information, while the managers gave the highest mean value to training. On the whole, the managers perceived the services as 'adequate' (mean = 2.88, s.d = 0.95).

Table 19: Means and standard deviations of managers' perceptions about adequacy of services provided by NGOs

Service	Mean	s.d
Training	3.40	0.89
Input	3.00	1.87
Technology transfer	3.00	0.71
Agricultural information support	2.60	0.89
Credit	2.40	1.52
Overall Mean	2.88	0.95

n = 5 (multiple responses)

Scale: 1 = Not adequate   2 = Fairly adequate   3 = Adequate

4 = Very adequate   5 = Excellent

Source: survey Data, 2007

Relevance of service

From Table 20, a sizeable proportion of the farmers rated 'very relevant', for four out of the five services received from the NGOs, namely training (35.6%), agricultural information support (36.4%), input (46.8%) and technology transfer (48.5%). About 45 percent of the farmers rated credit as 'relevant'.

Table 20: Farmers' perceptions about relevance of services provided by NGOs

Service	N	1	2	3	4	5
		%	%	%	%	%
Training	295	1.0	10.5	32.9	35.6	20.0
Agric Information	242	0.8	5.0	21.9	36.4	36.0
Input	237	0.4	1.7	24.5	46.8	26.6
Technology Transfer	196	2.6	5.6	18.9	48.5	24.5
Credit (cash)	73	2.7	31.5	45.2	16.4	4.1

n = 323 (multiple responses)

Scale: 1 = Not relevant   2 = Fairly relevant   3 = Relevant

4 = very relevant   5 = Excellent

Source: Survey Data, 2007

The farmers' perceived relevance of the services rendered by NGOs in terms of means and standard deviations are shown in Table 21. With the exception of credit (mean = 2.88, s.d. = 0.87) which was perceived to be 'relevant', all the other services, agricultural information (mean = 4.02, s.d. = 0.92), input (mean = 3.97, s.d. = 0.79), technology transfer (mean = 3.87, s.d.

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= 0.94) and training (mean = 3.63, s.d. = 0.95) were rated as 'very relevant'. The findings however, support Orhin's (2003) work which reported that farmers rated credit (cash) and agricultural information as 'relevant' and 'very relevant' respectively.

Table 21: Means and standard deviations of farmers' views of relevance of services provided by NGOs

Service	n	Mean	s.d.
Agric Information	242	4.02	0.92
Input	237	3.97	0.79
Technology transfer	196	3.87	0.94
Training	295	3.63	0.95
Credit	73	2.88	0.87
Overall mean		3.67	0.80

N = 323 (multiple responses)

Scale: 1 = Not relevant   2 = Fairly relevant   3 = Relevant

4 = Very relevant   5 = Excellent

Source: Survey Data, 2007

The overall mean for relevance of service was 3.67 with standard deviation of 0.80. The overall mean value of 3.67 indicates that the services were perceived to be very 'relevant' to their farm enterprise. The low standard deviation indicates that the farmers were mostly agreed in their opinion on the relevance of NGO support services.

The results in Table 22 show that the managers perceived all the services to be 'very relevant'. Credit (mean = 4.20, s.d = 0.84), however, was perceived

to have an edge over the other services. Agricultural information support had the lowest mean value (mean = 3.60). The reverse is true for the farmers, where agricultural information had the highest mean value (mean = 4.02) and credit had the least mean value (mean = 2.88).

Table 22: Means and standard deviations of managers' perceptions about relevance of services provided by NGOs

Service	N	Mean	s. d
Credit	5	4.20	0.84
Input supply	5	4.00	1.00
Training	4	3.80	0.45
Technology transfer	5	3.80	0.84
Agricultural information	4	3.60	0.55
Overall Mean		3.80	0.54

n = 5

Scale: 1 = Not relevant   2 = Fairly relevant   3 = Relevant

4 = very relevant   5 = Excellent

Source: Survey Data, 2007

Overall, both managers and farmers perceived the services to be 'very relevant'. The implication is that the farmers would be in a better position to carry out their activities efficiently and increase output. The results generally indicate that the intervention was effective.

Credit

The farmers were asked whether they received or did not receive credit from the service providers. Most (98.4%) of the farmers received credit for their farming activities.

The overwhelming number of farmers who received credit shows the crucial role credit provision played in the intervention. Johnson (1983) emphasized the importance of credit in modernizing farming and in achieving adequate rises in production and rural living standards.

Forty percent of the managers said they were not able to extend credit facility to all the farmers because of limited funds. Furthermore, farmers could only qualify for a loan if they belonged to a farmer's group.

The study also sought to know the form in which credit was provided. The majority (77%) of the farmers said it was provided in kind while 23 percent said it was provided in cash (Figure 6). This suggests that NGOs generally prefer giving out credit to clients in kind. The provision of credit in kind might be to ensure it was used for the intended purpose. Fakorede (1982) noted that most Nigerian farmers used small, short-term loans from the Agricultural Credit Corporation to cater for their domestic and other non-agricultural problems instead of using them for agricultural purposes.

□ Cash
■ Kind

23%

77%
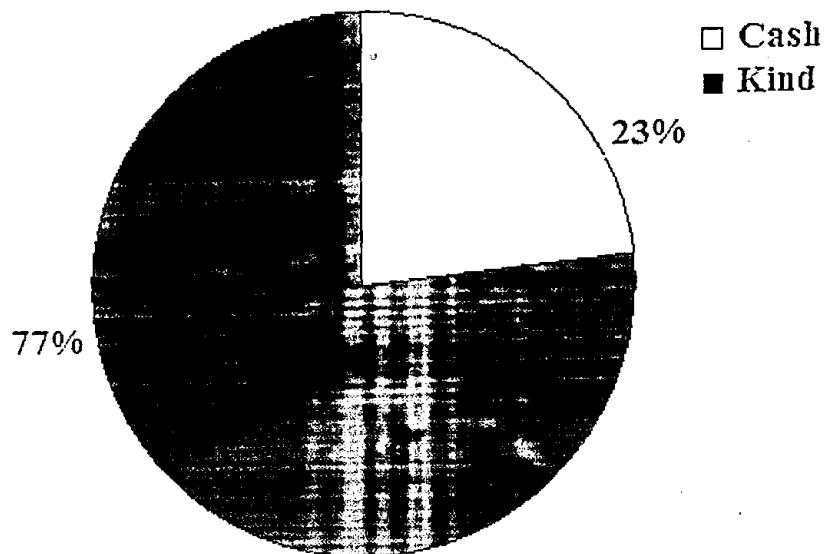
Fig. 6: Form of credit provision

Source: Survey Data, 2007

The results in Figure 7 show how the farmers accessed the credit facility. About 94 percent of the farmers got the credit directly from the NGOs, while 6 percent got it through the bank.

6%

□ Through the bank
▣ Directly from NGO

94%
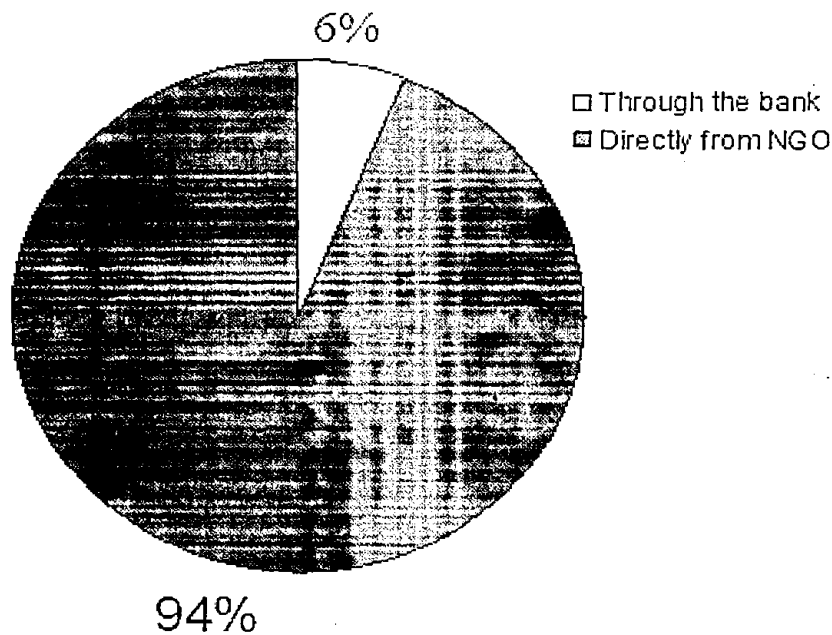
Fig. 7: Means of accessing credit

Source: Survey Data, 2007

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Farmers' perceptions about the procedure for accessing credit were also investigated. The results are presented in Table 23.

Table 23: Farmers' perceptions about procedure for accessing credit

Perception about procedure	Frequency	Percent
Very easy	5	20.8
Easy	68	53.8
Fairly difficult	67	21.5
Difficult	10	3.2
Very difficult	2	0.6
Total	312	100.0

n = 323

Source: Survey Data, 2007

About 75 percent of the farmers found the procedure for accessing credit to be either 'very easy' or 'easy'. The implication is that many farmers would want to become involved with NGOs programmes and access credit. However, Nabare's (2007) study in Upper East Region found the procedure for accessing loans to be a constraint to the micro-credit scheme.

While the majority (53.8%) of the farmers found the procedure for accessing credit to be 'easy', most (60%) of the managers found the procedure for granting credit to be 'fairly difficult'. A possible explanation is that much of the work leading to the granting of the credit might have been done by the managers for the farmers.

Interest on the credit facility

The study also sought to know the perceptions of farmers about the interest rate on the credit facility. The results are presented in Figure 8. Thirty-seven percent of the farmers indicated that the interest rate was 'low', followed by approximately 34 percent for 'moderate' and 14 percent for 'very low' interest rate. About 51 percent of the farmers indicated that the interest rate was either 'very low' or 'low'. About 3 percent of the farmers in the two municipalities indicated that the interest rate was 'very high'.
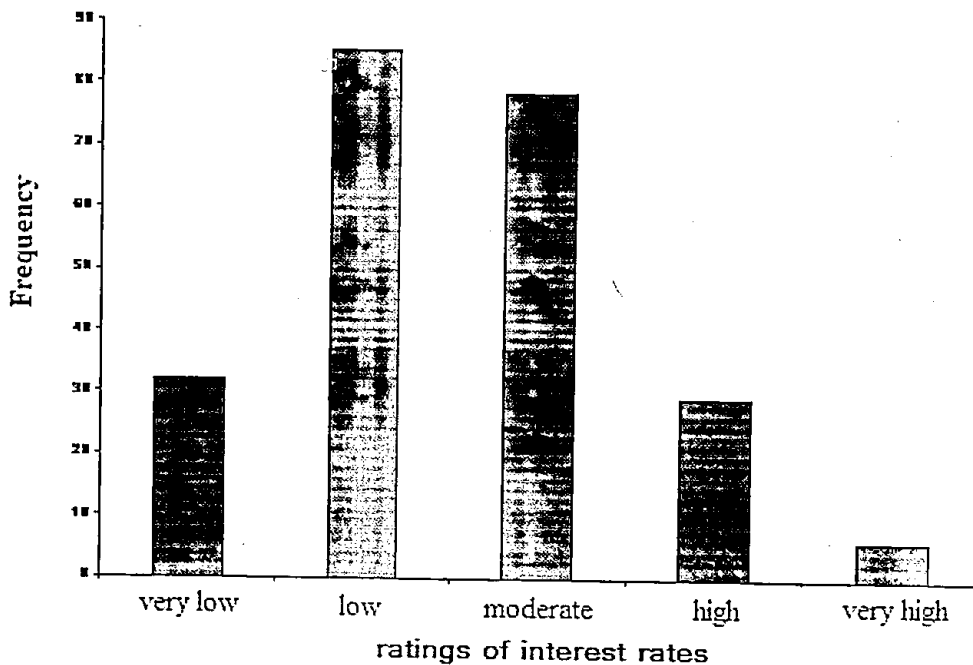
Fig. 8: Farmers' perceptions about interest rates

Source: Survey Data, 2007

The percentage interest charged on the credit facility is presented in Table 24. The majority (58.0%) of the farmers in the Mfantsiman and KEEA municipalities indicated that the interest rate was 10.0 percent followed by 19.0 percent of farmers who put the interest rate at 10.5 percent. Thus, 77.0 percent of the farmers put the rate at either 10.0 percent or 10.5 percent.

Table 24: Interest rates charged on credit disbursed

Interest rate (percentage)	Frequency	Percent
2.0	1	0.5
10.0	119	58.0
10.5	39	19.0
20.0	30	14.6
34.0	16	7.8
Total	205	100.0

n = 323

Source: Survey Data, 2007

The majority (60%) of the managers put the interest rate at 10 – 15 percent and this they indicated was low or very low. Iheduru (2002) pointed out that an interest rate of 10 percent brought about an upsurge in economic activities of members of Family Economic Advancement Programme and created avenues for the people to earn higher incomes. The low interest rate might also be responsible for boosting the general performance of clients' enterprise. Even though many farmers would want credit for their farming, they are often confronted by two main problems: high interest rate and the provision of collateral security. The informal sector, made up largely of individuals, lend money as a business. They are traditionally characteristised as highly usurious and in positions of power due to lack of local competition (Yaron, 1992; Poulton et al., 1997). The demand for collaterals by financing institutions also cut out many small scale and medium enterprises (Ablordeppey, 2003).

The low interest rate and the exclusion of collateral security from the

requirements might explain why almost all the farmers accessed credit from or through the NGOs.

Timeliness of credit provision

The majority (83.0%) of the farmers indicated that credit provision was timely as against 17.0 percent of farmers who said it was not timely. According to Iheduru (2002), timelines of loan disbursement is crucial when loans are being used for seasonal activities such as agriculture. Farmers who benefit from timely delivery of loans can undertake their activities when they wish to and this may enhance the prospects of repayments.

Use of credit

The various uses to which farmers put their credit was investigated and the results are presented in Table 25. Farmers used the credit mainly for seeds and fertilizer and also for planting. The farmers who used the credit to purchase seeds and fertilizer were 44.1 percent, planting 40.7 percent.

Table 25: Distribution of farmers by the use of credit

Credit use	Frequency	Percent
Seed & fertilizer	78	44.1
Planting	72	40.7
Weeding/transplanting	22	12.4
Animal Production	4	2.3
Field boots	1	0.6

n = 323 (multiple responses)

Source: Survey Data, 2007

This is confirmed by Iheduru (2002) who stated that credit facilities provided to women involved in agriculture enabled them to purchase fertilizers. Feder et al. (1985) also indicated that access to credit may allow an increased acquisition and use of improved seeds and fertilizer leading to high crop output per unit of land and labour. The results actually show that the farmers used the credit for the intended purpose. This was confirmed by the managers and in effect dispels any negative notion that service providers may have about clients not using credit facilities for the intended purpose. With proper supervision and education NGOs can ensure that farmers use credit for the right purpose.

Loan repayment

It is worthy to note that 85.9 percent of the respondents did not have problems of loan repayment. This find is confirmed by IFAD (2000) which reported credit repayment rates of close to 98% in Bangladesh due to effective supervision of loans recoveries. However, 80 percent of the project managers indicated that although they were able to recover much of the credit they had much difficulty recovering them. The reasons given included difficulty farmers face in parting with liquidity and also credit provision at the wrong time resulting in the reduction of their profit margin, hence their inability to repay the loan at the right time. All the managers agreed that credit was recovered in cash from clients. This perhaps also explains why they had some difficulty recovering the loans.

Inputs

This section of the study gives a broad overview of the inputs required by farmers for their agricultural activities, the availability and cost of the inputs as well as the timeliness of provision by NGOs.

Inputs required for production

Farmers were asked to indicate the inputs required for their agricultural activities. The results are presented in Table 26. All the farmers interviewed indicated that they needed 15 out of 19 inputs for production. The remaining four inputs needed by the farmers were hand tools (99.6%), seedlings (99.5%), fertilizers/manures (99.5%) and baskets/crates (96.6%).

Table 26: Distribution of farmers by inputs required

Inputs Required	Frequency	Percent
Seeds	186	100
Other agric chemicals	50	100
Market facilities	45	100
Storage & preservation facilities	28	100
Water containers	23	100
Packaging materials	19	100
Trays	17	100
Fuel wood	11	100
Tillage equipment	11	100
Oven	10	100
Animals	6	100
Drugs/vaccine Processing plant	5	100

Table 26: Cont.

Animal feed	4	100
Animal house	1	100
Hand tools	225	99.6
Seedlings	194	99.5
Fertilisers/manure	189	99.5
Baskets/crates	28	96.6

n = 323 (multiple responses)

Source: Survey Data, 2007

Availability of inputs for crop production

About 40 percent of the farmers indicated that seeds/planting materials were 'readily available' to them (Table 27). The rest of the inputs were rated by a large proportion of the farmers as 'not available'. These were seedlings (47.8%), hand tools (53.1%), fertilisers/manures (59.0%), other agro-chemicals (69.4%), tillage equipment (90.4%), processing plants (82.8%), storage and preservation equipment (83.2%) and market facilities (87.1%). Dankwa's (2004) survey in the Ashanti Region revealed that 47.0 percent of the farmers perceived farm inputs to be sometimes available while 21.1 percent rated the inputs as 'not available'. The unavailability of farm inputs generally has the effect of hindering expansion of the enterprise.

Table 27: Farmers' perceptions about input availability for crop

production

Input	N	Not available		Barely available		Available		Readily Available	
		F	%	F	%	F	%	F	%
Seeds/planting materials	290	93	32.1	12	4.1	68	23.4	117	40.3
Seedlings	291	139	47.8	15	5.2	22	7.6	115	39.5
Hand tools	294	156	53.1	14	4.8	44	15.0	80	27.2
Fertiliser/manure	290	171	59.0	12	4.1	61	21.0	46	15.9
Other agro-chemicals	291	202	69.4	14	4.8	37	12.7	38	13.1
Tillage equipment	293	265	90.4	7	2.4	5	1.7	16	5.5
Processing plants	291	241	82.8	9	3.1	27	9.3	14	4.8
Storage & Preservation facilities	286	238	83.2	35	12.2	11	3.8	2	0.7
Market facility	279	243	87.1	13	4.7	23	8.2	0	0

n = 294 (multiple responses)

Source: Survey Data, 2007

The means and standard deviations of farmers' perceptions about availability of inputs are shown in Table 28. The means ranged from 1.21 to 2.72. Seeds/planting materials (mean = 2.72) were the inputs with the highest mean and were perceived by the farmers to be 'available'. These were followed in succession by seedlings (mean = 2.39, s.d. = 1.41), hand tools (mean = 2.16, s.d. = 1.32), fertilisers/manures (mean = 1.94, s.d. = 1.20), other

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agro-chemicals (mean = 1.69, s.d. = 1.12) which were all perceived by farmers to be 'barely available'. Market facility was the item with the lowest mean (mean = 1.21) and it was perceived to be 'unavailable'. Overall, the inputs for crop production were perceived by the farmers to be 'barely available' (mean = 1.78). An overall standard deviation (s.d. = 0.73) indicates that farmers were uniform in their opinions on the availability of inputs.

Table 28: Means and standard deviations of farmers' views of availability of inputs for crop production

Inputs	n	Mean	s.d.
Seeds/planting materials	290	2.72	1.29
Seedlings	291	2.39	1.41
Hand tools	294	2.16	1.32
Fertilisers/manures	290	1.94	1.20
Other agro-chemicals	291	1.69	1.12
Processing plants	291	1.36	0.84
Tillage equipment	293	1.22	0.73
Storage/preservation facilities	286	1.22	0.54
Market facility	279	1.21	0.58
Overall mean		1.78	0.73

n = 294 (multiple responses)

Scale: 1 = Not available   2 = Barely available   3 = Available

       4 = Readily available

Source: Survey Data, 2007

Availability of inputs for fish processing

The results of input availability for fish processing revealed that almost all the clients perceived the following inputs to be 'not available' oven (95.5%), trays (90.5%), fuelwood (95.2%), water containers (90.5%), baskets/crates (90.5%) and packaging materials (90.5%). The implication is that the clients would be constrained in processing fish for consumers. The quantity of fish processed would be small and clients would find it difficult to expand their enterprises. However, all the clients perceived storage and preservation facilities and market facility to be 'available' (Table 29). This means that the clients can obtain these inputs with little difficulty provided they have the money to purchase them.

Table 29: Farmers' perceptions about input availability for fish processing

Input (fish)	n	Not available		Barely available		Available	
		F	%	F	%	F	%
Oven	22	21	95.5	1	4.5	0	0.0
Trays	21	19	90.5	1	4.8	1	4.8
Fuel wood	21	20	95.2	1	4.8	0	0.0
Water containers	21	19	90.5	2	0.5	0	0.0
Baskets/crates	21	19	90.5	2	9.5	0	0.0
Packaging materials	21	19	90.5	2	9.5	0	0.0
Storage & preservation facilities	0	0	0.0	0	0.0	1	100.0
Market facility	0	0	0.0	0	0.0	1	100.0

n = 23 (multiple responses)
Source: Survey Data, 2007

From Table 30, almost all the inputs were rated as 'not available'. The overall mean was 1.17 with standard deviation of 0.48. The low standard deviation of 0.48 indicates that the opinions of the fishsmokers/fishmongers were uniform. According to Savale, non-availability and inadequacy of supply affected adoption to a considerable extent (as cited in Byrnes, 1978, p.80).

Table 30: Means and standard deviations of farmers' perceptions about input availability for fish processing

Inputs (fish)	n	Mean	s.d.
Market facility	1	3.00	
Storage & preservation facilities	1	3.00	
Trays	21	1.14	0.48
Packaging materials	21	1.10	0.30
Baskets/crates	21	1.10	0.30
Water container	21	1.10	0.30
Fuel wood	21	1.05	0.22
Oven	22	1.05	0.21
Overall mean		1.17	0.48

n = 23

Scale: 1 = Not available   2 = Barely available   3 = Available

Source: Survey Data, 2007

Cost of inputs for crop production

Farmers require inputs for land preparation, planting and post-planting activities. They were asked to indicate their opinions on the cost of inputs commonly used for production. Their opinions were based on a 5 point Likert

scale that ranged from 1, meaning 'very cheap' to 5, meaning 'very expensive'. The results of their opinions are presented in Table 36. About 41 percent of the farmers rated seeds/planting materials as 'expensive' while 31.1% rated 'moderately expensive' for seedlings. Hand tools (36.8%) and fertilisers/manures (38.1%) were rated by a sizeable proportion of the farmers as 'expensive' and 'moderately expensive' respectively. The following inputs: other agro-chemicals (36.5%), tillage equipment (52.2%) and processing plants (75.6%) were all rated as 'expensive'. However, storage and preservation facilities and market facility were both rated by the majority of farmers as 'moderately expensive'.

The results show that a substantial proportion of the farmers ranging from 6.7 percent to 75.6 percent perceived the cost of inputs to be either 'expensive' or 'very expensive'. Dankwa (2004) also found that the majority (68.9%) of the farmers in Ashanti Region perceived the cost of inputs to be 'high' or 'very high'. It was observed that the high cost coupled with scarcity of inputs could adversely affect maintenance levels and productivity. Consequently, the farmers recommended the opening of farm input stores and the re-introduction of subsidies.

The high cost of crop production inputs is a worrying phenomenon since the majority of farmers in Ghana are in crop production and are generally poor. Studies in Ghana have shown that poverty is overwhelmingly a rural phenomenon and is especially common among food crop farmers (Squire & Demery, 1996). The level of poverty implies that crop farmers would have difficulty purchasing sufficient inputs for modernizing their farms and for production.

The results would be low yields and income, food insecurity and high cost of living. The government and NGOs should assist such farmers to acquire inputs at affordable cost so that they will be able to cultivate bigger plots of land. A few respondents ranging from 2.2 percent to 17.2 percent, however, perceived the cost of inputs for crop production to be either 'very cheap' or 'cheap'.

Table 31: Farmers' perceptions about the cost of inputs for crop production

Inputs (crops)	n	Very cheap	Cheap	Moderately expensive	Expen- sive	Very Expensive
		%	%	%	%	%
Seeds/ planting materials	195	9.7	5.6	36.9	40.5	7.2
Seedlings	151	17.2	8.6	31.1	21.9	21.2
Hand tools	133	15.8	8.3	32.3	36.8	6.8
Fertilisers/ manures	113	3.5	7.1	38.1	29.2	22.1
Other agro- chemicals	85	0.4	0	28.2	36.5	32.9
Tillage equipment	23	4.3	4.3	21.7	52.2	17.4
Processing plants	45	0	2.2	15.6	75.6	6.7
Storage & preservation facility	43	4.7	7.0	55.8	23.3	9.3
Market facility	32	6.3	0	71.9	21.9	0

n = 294 (multiple responses)

Source: Survey Data, 2007

Table 32 shows a mean value of 3.23 with a standard deviation of 0.99 which indicates uniformity in their responses. Out of the nine inputs five were perceived to be 'moderately expensive', with means ranging from 3.09 to 3.30. The remaining four inputs namely other agro-chemicals, processing plants, tillage equipment and fertilisers/manure with means ranging from 3.59 to 3.98 were perceived to be 'expensive'.

Table 32: Means and standard deviations of farmers' perceptions about cost of inputs for crop production

Crop inputs	N	Mean	s.d.
Other agro-chemicals	85	3.98	0.91
Processing plants	45	3.87	0.55
Tillage equipment	23	3.74	0.96
Fertilisers/manures	113	3.59	1.02
Seeds/planting materials	195	3.30	1.03
Storage and preservation facilities	43	3.26	0.90
Seedlings	151	3.21	1.35
Hand tools	133	3.11	1.16
Market Facility	32	3.09	0.69
Overall mean		3.23	0.99

n = 294 (multiple responses)

Scale: 1 = Very cheap 2 = Cheap   3 = Moderately expensive

4 = Expensive 5 = Very expensive

Source: Survey Data, 2007

Since most NGOs do not provide much financial assistance to farmers, only very few farmers could buy these 'expensive' items. According to Byrnes (1978), the ability of the farmer in a developing country to adopt innovations which require purchasing inputs will depend on existing price levels. This implies that high cost of inputs may hinder adoption of improved technologies. The high input cost is likely to compel the farmers to use traditional farming methods which attract very little cost. Consequently, productivity will be adversely affected. As a solution to the high cost of the technology Srivastava (1985) and Carr (1981) recommended that technologies for African farmers should have the characteristic of affordability without the farmers incurring high personal cost.

Cost of inputs for fish processing

From Table 33, all the clients rated oven, trays and fuelwood as 'expensive'. Packaging materials, storage and preservation facilities and market facility were rated by all the clients as 'moderately expensive'. A substantial proportion of clients rated water container as 'expensive' (50%) and 'very expensive' (50.0%).

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Table 33: Fish processors' perceptions about cost of inputs

Inputs (Fish)	n	Cheap		moderately expensive		expensive		very expensive	
		F	%	F	%	F	%	F	%
Oven	1	0	0.0	0	0.0	1	100.0	0	0.0
Trays	2	0	0.0	0	0.0	2	100.0	0	0.0
Fuelwood	1	0	0.0	0	0.0	1	100.0	0	0.0
Water container									
Basket/crate	2	0	0.0	0	0.0	1	50.0	1	50.0
Packaging materials	2	1	50.0	1	50.0	0	0.0	0	0.0
Storage and preservation	2	0	0.0	2	100.0	0	0.0	0	0.0
facilities	1	0	0.0	1	100.0	0	0.0	0	0.0
Market facility	1	0	0.0	1	100.0	0	0.0	0	0.0

n= 23

Source: Survey Data, 2007

From the results in Table 34, water containers were rated as 'very expensive' (mean = 5.40, s.d. = 0.71). Market facility, storage and preservation facilities, fuelwood, trays and oven were rated as 'expensive'. However, packaging materials (mean = 3.00, s.d. = 0.00) and basket/crate (mean = 2.50, s.d. = 0.71) were rated as 'moderately expensive'.

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Table 34:Means and standard deviations of perceived cost of inputs for fish processors

Inputs (fish)	N	Mean	s.d.
Water Container	2	4.50	0.71
Market facility	1	4.00	-
Storage and preservation facility	1	4.00	-
Fuelwood	1	4.00	-
Trays	2	4.00	0.00
Oven	1	4.00	
Packaging materials	2	3.00	0.00
Basket/crate	2	2.50	0.71
Overall mean		3.69	0.39

n = 23

Scale: 1 = Very cheap   2 = Cheap   3 = Moderately expensive

4 = Expensive   5 = Very expensive

Source: Survey Data, 2007

Generally, respondents perceived the cost of inputs for fish processing to be 'expensive' (mean = 3.69), more expensive than inputs for crop production. An overall standard deviation of 0.39 indicates that all the clients expressed similar opinions on the cost of inputs. The finding that the cost of inputs for fish processing is expensive is supported by Tete (1996) who reported that a major problem faced by fish smokers was the high cost of inputs. This implies that many fish smokers may be unable to buy inputs to expand their business,

may be thrown out of job or may have to sell their processed fish at a high price.

Timeliness of input provision

The majority (86.1%) of the farmers indicated that inputs were provided on time by the service providers. The timely supply of inputs is particularly important for seasonal activities such as agriculture. Crop production in Ghana is generally rain-fed. Farmers therefore wish to carry out land preparation and planting on schedule so that their crops can take advantage of the rains. Inputs for other cultural practices during farming season must be available on time if a good harvest is to be assured. Delays in the supply of inputs could have negative consequences on the farm business.

Training

As shown in Table 35, 89.2 percent of the farmers indicated that the service providers used group discussion method for their training, followed by 59.5 percent of farmers who mentioned farm/site visits. This result is consistent with that of Dankwa's (2004) finding that the majority of farmers mentioned group discussion (78.0%) and farm visits (77.0%) as the two main methods used by the AEAs.

In addition, the farmers reported that service providers used method demonstration (44.0%), lecture (31.1%) and result demonstration (20.8%) for the training. The project managers also used all the methods mentioned by the farmers. The main ones used were group discussion (100%), farm/site visits (100%), method demonstration (80%), result demonstration (80%) and the least being lecture (60%). Both farmers and managers reported group

discussion and farm/site visit in that order as the most important methods. One manager (20%) also reported the use of drama by her NGO.

Table 35: Methods NGOs used to train farmers

Training method	Yes		No	
	Freq.	%	Freq	%
Group Discussion	273	89.2	33	10.8
Farm/site visit	188	59.5	128	40.5
Method Demo	136	44.0	173	56.0
Lecture	95	31.1	210	68.9
Result demo	64	20.8	243	79.2

n = 323

Source: Survey Data, 2007

The results reveal that service providers employed different methods for training. This finding is confirmed by Fliegel (1989) who asserted that a combination of extension methods is the ideal. By using the group discussion, service providers could reach more people than the individual method. It is also an important factor when staff and time are limited. Group methods are effective in persuading clients to try a new practice or idea.

Farmers were also asked to indicate their preferred method of training. As illustrated in Table 36, 48.6 percent of the farmers said they preferred group discussion. This was followed in succession by method demonstration (21.4%) and farm visit (20.0%).

Table 36: Farmers' preferred training method

Preferred method	Frequency	Percent
Group discussion	157	48.6
Method demonstration	69	21.4
Farm visit	67	20.8
Result demonstration	21	6.5
Lecture	8	2.5
Total	322	100

n = 323

Source: Survey Data, 2007

Obviously, the group discussion method was the most preferred method as shown by the results. It consists of a group that discusses a certain topic for some time. In the group there is exchange of information. There is involvement of every member of the group and re-enforcement. According to Garforth (1982), groups offer a more effective learning environment through mutual re-enforcement and group pressure against the rejection of new practices or ideas. Additionally the knowledge and experience of members of the group are helpful in solving their common problems. Practical demonstrations are often emphasised in agricultural training. In method demonstration, service providers actually demonstrate how a practice should be carried out. It has the potential to convince farmers to accept new ideas.

The results also show that 20.8 percent of the farmer respondents preferred farm visits. These visits enable service providers to learn the problems on the farm and provide information and assistance to farmers on

relevant innovations. It also provides opportunity for the farmer to develop a closer working relationship with the service provider. The lecture method was rated as the least preferred method. This could be attributed to the low educational level of the farmers (Table 6). Forty percent of the project managers perceived farm visits as the preferred training method for the farmers. The finding collaborates the results of Orhin (2003) and Dankwa (2004). The reason given by the farmers in their studies for rating farm visits as the most effective and most preferred method is that it afforded them the opportunity to ask practical questions and receive ready answers.

The project managers' view of the most preferred method of training clients, contrasts with the farmers' own views. While forty percent of the managers indicated that clients preferred farm visits, 48.6 percent of the clients themselves indicated their preference for group discussion. It appears that the training method used by the project managers did not suit the preferred method of the farmers. This might affect their understanding, retention and use of the imparted knowledge, thus making the training ineffective. Andrews (2003) found a low significant relationship between training method and adoption of innovations, implying that AEAs have not been as effective as expected in so far as their teaching methods are concerned. For training to be effective, project managers should find out and use the methods that their clients prefer.

Table 37 presents the crosstabulation of the characteristics of the farmers with their preferred training methods. The group discussion method was popular with the farmers, irrespective of their level of education, age, gender and Municipality. This method was mostly preferred by JSS/Middle school

leavers (46.2%), farmers aged 40-49 years (34.9%) and female farmers (56.4%). This suggests that these groups of farmers find it easier to learn through group discussion.

About 63.7 percent and 36.3 percent of the farmers in Mfantsiman Municipality and KEEA Municipality respectively preferred group discussion. The lecture method was the least popular method even with the youngest and oldest farmers, as well as the more educated ones. It could be concluded that the lecture method was not effective in the training of the farmers in the study area. This is consistent with the assertion by Pretty et al (1995) that learning is not guaranteed in a lecture.

Table 37: Characteristics of farmers by preferred training method

Characteristic Municipality	Farm visit F	Group discussion F	Method demo F	Result demo F	Lecture F	Total
Education						
No education	27(42.2)	63(40.4)	27(39.7)	5(23.8)	2 (25.0)	124
Primary	7 (10.9)	17(10.9)	6 (8.8)	2(9.5)	1 (12.5)	33
JSS/Middle	30(46.9)	72(46.2)	32(47.1)	13(61.9)	5 (62.5)	152
Sec/Tech	0 (0.0)	2 (1.3)	2 (2.9)	1 (4.8)	0 (0.0)	5
Tertiary	0 (0.0)	2 (1.3)	1 (1.5)	0 (0.0)	0 (0.0)	3
Total	64(100.0)	156(100.0)	68(100.0)	21(100.0)	8(100.0)	317
Age (yrs)						
20 – 29	5 (7.5)	10(6.6)	2 (2.9)	1 (4.8)	0 (0.0)	18
30 – 39	19(28.4)	40(26.3)	21 (30.4)	13(61.9)	3 (37.5)	96

Table 37: Cont.

40 – 49	24(35.8)	53(34.9)	20(29.0)	4 (19.0)	3 (37.5)	104
50 – 59	12(17.9)	29(19.1)	20(29.0)	2 (9.5)	2 (25.0)	65
> 59	7 (10.4)	20(13.2)	6 (8.7)	1 (4.8)	0 (0.0)	34
Total	67(100.0)	152(100.0)	69(100.0)	21(100.0)	8(100.0)	317
<u>Sex</u>						
Male	34(51.5)	68(43.6)	37(53.6)	6 (28.6)	5 (62.5)	150
Female	32(48.5)	88(56.4)	32(46.4)	15(71.4)	3 (37.5)	170
Total	66(100.0)	156(100.0)	69(100.0)	21(100.0)	8(100.0)	320
<u>Municipality</u>						
Mfantsiman	46(68.7)	100(63.7)	23(33.3)	8 (38.1)	4 (50.0)	181
KEEA	21(31.3)	57(36.3)	46(66.7)	13(61.9)	4 (50.0)	141
Total	67(100.0)	157(100.0)	69(100.0)	21(100.0)	8(100.0)	322

Figures in parentheses are row percentages

Source: Survey data, 2007

As shown in Table 38, the majority (64.2%) of the farmers indicated that they held meetings twice a month, followed by 24.1 percent who indicated once a month. Andrews (2003) reported that 41.7 percent of the farmers in the Greater Accra Region held meetings weekly.

Table 38: Farmers frequency of holding meetings

Rate of Meeting	Frequency	Percent
Once in two or more months	28	9.1
Once a month	74	24.1
Twice a month	197	64.2
Thrice a month	5	1.6
> 4 x a month	3	1.0
Total	307	100

n = 323

Source: Survey Data, 2007

The frequency of meetings is important in helping farmers to update their knowledge and skills and make decisions for adoption. The meetings also provide a forum for farmers to share information and seek advice, thus contributing to the effectiveness of the programme.

Technology transfer and adoption

This section presents information on the awareness and adoption of technologies currently used in agriculture. The extent to which the farmers adopted technologies for crop production and fish processing are discussed.

Awareness of agricultural technologies

The results in Table 39 reveal that for 11 out of 26 technologies more than 50% of farmers interviewed indicated that they were aware. Five of these technologies were in crop production, four in animal production and two in

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fish processing indicating differences in awareness based on type of enterprise. The percentage of farmers who indicated awareness was particularly high for the following technologies: line/row planting (95.9%), improved trays (94.4%), improved varieties (88.4%), timely weeding (86.5%), correct spacing (84.6%), Chorkor smoker (83.3%) and suitable housing (83.3%).

Table 39: Farmers' awareness of agricultural technologies

Technology	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Line/row planting	281	95.9	5	1.7
Improved trays	17	94.4	0	0
Improved varieties	259	88.4	11	3.8
Timely weeding	250	86.5	33	11.4
Correct spacing	248	84.6	37	12.6
Chorkor smoker	16	83.3	0	0
Suitable housing	5	83.3	1	16.7
Packaging (animals)	17	65.4	3	11.5
Improved breed	4	66.7	1	16.7
Grading (animals)	16	64.0	3	12.0
Chemical fertiliser	146	50.2	78	26.8
Market infrastructure (fish)	1	50.0	0	0
Chemical disease control	131	45.2	99	34.1
Chemical pest control	115	39.5	118	40.5

Table 39: Cont.

Grading (crops)	86	30.0	88	30.7
Improved maize crib	68	26.7	66	25.9
Organic manure	74	25.8	138	48.1
Chemical crop storage and preservation	64	25.1	43	16.9
Health	1	25.0	2	50.0
Packaging (crops)	67	23.6	58	20.4
Market infrastructure (animals)	1	20.0	3	60.0
Balanced ration	1	16.7	4	66.7
Plough/harrow	29	10.0	25	8.6
Market infrastructure (crops)	26	9.0	42	14.5
Processing plants	20	7.8	4	1.6
Refrigerator/freezer	6	2.5	35	14.4

n = 323

Source: Survey Data, 2007

Apart from chemical fertilisers for which 50.2 percent of farmers reported awareness, less than 50.0 percent of farmers were aware of the use of chemicals for disease control, pest control and crop storage and preservation. Only 2.5 percent of the farmers were aware of refrigerators/freezer technologies for storage and preservation. Adoption usually begins with

awareness of the technology. For farmers to adopt a technology they must first know it (CIMMYT, 1993). NGOs should therefore create awareness of technologies in the various communities as the first step in the adoption process. Lack of awareness observed among the farmers is likely to hinder or delay their adoption of the relevant technologies.

Adoption of technologies for crop production

The extent of adoption of technologies as depicted in Table 40 indicates that a sizeable proportion of the farmers 'sometimes use' three out of the 16 technologies on their farms. The three technologies include improved varieties (37.5%), line/row planting (40%), and timely weeding (28.3%). Correct spacing was rated as 'often used' by most (28.2%) of the farmers. A range of 47.7 percent to 55.3 percent of the farmers mentioned that they 'often used' or 'always used' improved varieties, line/row planting, correct spacing and timely weeding. It shows the importance attached to these technologies in the study area. Improved varieties are usually recommended to farmers since they have the potential for increasing crop yields. Row planting also increases yields and makes it easy to carry out cultural practices. Correct spacing ensures optimum plant density. Farmers who practise timely weed control get the benefit of pest and disease control on their farms. This may reflect in improved quantity and quality of produce. Until farmers 'always use' these four technologies, the NGOs programme would not be effective. A high proportion of the farmers in the Adansi District in Ashanti Region reported that row planting increased their yields (66.5%) and income (66%) and that timely weeding also increased their yields (43%) (Kagya-Agyemang, 2001).

Table 40: Extent of adoption of technologies for crop production

Technology	NA F	NA %	IUS F	IUS %	SU F	SU %	OU F	OU %	AU F	AU %
Improved varieties	15	5.6	16	5.9	101	37.5	74	27.5	63	23.4
Line/row planting	7	2.5	28	9.8	114	40.0	67	23.5	69	24.2
Correct spacing	34	12.0	15	5.3	78	27.5	80	28.2	77	27.1
Timely weeding	31	11.0	29	10.2	80	28.3	74	26.1	69	24.4
Chemical pest Control	138	58.2	14	5.9	40	16.9	33	13.9	12	5.1
Chemical disease control	120	50.6	21	8.9	35	14.8	51	21.5	10	4.2
Organic manure	151	69.3	9	4.1	28	12.8	24	11.0	6	2.8
Chemical fertiliser	101	46.5	16	7.4	53	24.4	35	16.1	12	5.5
Plough / harrow	47	72.3	2	3.1	3	4.6	9	13.8	4	6.2
Processing plants	13	50.0	1	3.8	4	15.4	8	30.8	-	-
Market infrastructure	45	67.2	4	6.0	11	16.4	6	9.0	1	1.5
Grading	85	50.0	14	8.2	43	25.3	13	7.6	15	8.8
Packaging	60	47.2	8	6.3	21	16.5	36	28.3	2	1.6
Chemical crop storage & preservation	47	43.5	8	7.4	33	30.6	11	10.2	9	8.3
Improved maize crib	65	49.6	11	8.4	31	23.7	17	13.0	7	5.3
Refrigerator/freezer	32	80.0	1	2.5	2	5.0	2	5.0	3	7.5

n = 294 (multiple responses)

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Scale: 1 = I have not adopted the technology (NA)   2= I initially used the technology but stopped (IUS)   3= I sometimes use the technology (SU)

4 = I often use the technology (OU)   5 = I always use the technology (AU)

Source: Survey Data, 2007

The results in Table 39 show that over 84 percent of the farmers were aware of these four production technologies compared to a range of 2.5 percent to 50 percent of the farmers who indicated that they were aware of the remaining technologies. Also, a range of 2.5 percent to 12.0 percent of the farmers did not adopt these four technologies compared to a range of 43.5 percent to 80.0 percent of the farmers who did not adopt the remaining technologies. It is therefore possible that the level of awareness affected the extent of adoption.

A large proportion of the farmers ranging from 43.5 percent to 85 percent did not adopt 12 technologies. These included agro-chemicals, tillage implements, processing plants, storage equipment and market infrastructure. From the results of this study, the non-adoption of these technologies could be attributed to the high cost of inputs, inadequate credit for the purchase of inputs or lack of awareness of the technologies. The methodological approach used by service providers may not be practical- oriented and convincing, hence non- adoption of the technologies. The implication is that the farmers cannot achieve the potential of their farms and their farm outputs and incomes would be below expectation. NGOs should therefore work harder to influence the farmers in the study area to adopt the technologies.

The results in Table 41 show the means and standard deviations of farmers' views about the adoption of crop technologies.

Table 41: Means and standard deviations of farmers' views about adoption of crop technology

Technology	N	Mean	s.d
Improved varieties	269	3.57	1.08
Line / row planting	285	3.57	1.04
Correct spacing	284	3.53	1.27
Timely weeding	283	3.43	1.27
Chemical storage and preservation	108	2.32	1.35
Packaging	127	2.31	1.35
Processing	26	2.27	1.37
Chemical fertilizer use	217	2.27	1.34
Chemical disease control	237	2.20	1.37
Grading	170	2.17	1.35
Improved maize crib	131	2.16	1.31
Chemical pest control	237	2.02	1.33
Plough / harrow use	65	1.78	1.36
Organic manure use	218	1.74	1.20
Market infrastructure	67	1.72	1.27
Refrigerator / freezer	40	1.57	1.26
Overall		2.79	0.84

n = 294

Scale: 1   = I have not adopted the technology (NA)

2 = I initially used the technology but stopped (IUS)

3 = I sometimes use the technology (SU)

4 = I often use the technology (OU)

5 = I always use the technology (AU)

Source: Survey Data, 2007

Out of the 16 technologies, farmers indicated that they 'sometimes use' or 'often use' only four of them, namely improved varieties (mean = 3.57, s.d = 1.04), line/row planting (mean = 3.57, s.d = 1.04), correct spacing (mean = 3.53, s.d = 1.27) and timely weeding (mean = 3.43, s.d = 1.27). The farmers indicated that they 'initially used' the remaining technologies but stopped. This may be explained by the fact that they did not perceive these technologies to be suitable for their situations or to produce profitable returns. The inability of the farmers to maintain the technology may also result in discontinuance. The standard deviation for each of the technologies shows that farmers varied widely in their responses. Table 41 shows an overall mean perception of 2.79 with a standard deviation of 0.84. The farmers generally agreed that they 'sometimes use the technology'.

Adoption of technologies for fish processing

The results in Table 42 show that majority of respondents 'always used' the Chorkor smoker (71.4%), improved trays (64.7%) and grading (94.1%). However, packaging was not adopted by the respondents suggesting that either they were not taught or they did not know the benefits that they could derive from it.

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Table 42: Extent of adoption of technologies for fish processing

Technology	n	NA		SU		OU		AU	
		F	%	F	%	F	%	F	%
Chorkor Smoker	14	3	21.4	0	0.0	1	7.1	10	71.4
Improved trays	17	3	17.6	2	11.8	1	5.9	11	64.7
Grading (fish)	17	0	0.0	0	0.0	1	5.9	16	94.1
Packaging (fish)	1	1	100.0	0	0.0	0	0.0	0	0.0

n = 23

Scale: 1 = I have not adopted the technology (NA)

2 = I initially used the technology but stopped (IUS)

3 = I sometimes use the technology (SU)

4 = I often use the technology (OU)

5 = I always use the technology (AU)

Source: Survey Data, 2007

The results in Table 43 reveal that the respondents 'often use' or 'always use' three main technologies namely grading (mean = 4.94, s.d = 0.24), Chorkor smoker (mean = 4.07, s.d =1.69), and improved trays (mean = 4.00, s.d = 1.58). Overall, the fishsmokers/fishmongers 'often use the technology' (mean = 4.25, s.d = 1.20).

Table 43: Means and standard deviations of farmers' views about adoption of fish technology.

Technology	N	Mean	s.d
Grading	17	4.94	0.24
Chorkor smoker	14	4.07	1.69
Improved trays	17	4.00	1.58
Packaging	1	1.00	-
Overall mean		4.25	1.20

n = 23

Scale: 1 = I have not adopted the technology (NA) 2 = I initially used the technology but stopped (IUS) 3 = I sometimes use the technology (SU) 4 = I often use the technology (OU) 5 = I always use the technology (AU)

Source: Survey Data, 2007

Agricultural information

This section describes other sources of agricultural information apart from the NGO. The preference for these sources and their reliability are also discussed.

Other sources of agricultural information

The distribution of farmers by other sources of agricultural information presented in Table 44 shows that farmers depend on a wide variety of sources for information. The majority (70.6%) of the farmers mentioned radio as their source of information, followed by farmer friends (49.5%).

Table 44: Distribution of farmers by other sources of agricultural information

Source of agricultural information	Frequency	Percent
Radio	228	70.6
Farmer friends	160	49.5
MOFA ext. agents	158	48.9
T.V.	91	28.2
Agric. Science teachers	12	3.7
Retailers	12	3.7
Newspapers/print media'	10	3.1
Truck drivers	10	3.1
Wholesalers	7	2.2

n = 323 (multiple responses)

Source: Survey Data, 2007

The result is contrary to Marshall's (2004) survey done in the Central region where the majority of farmers ranked farmer friends (88.7%) and radio FM (80.0%), in that order, as the two main other sources of information. In India extension agents and other farmers were found to be the leading sources of information (Feder & Slade, 1984).

Asante-Mensah (1988) found that about 56 percent of the farmers in his survey owned radios. Radio cannot convey detailed and complex information. However, it can reach a large number of people; especially as frequency modulation stations are common currently. Listeners can carry their radio wherever they go, and need not rely on electrical power. Radio works

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successfully at the local level and can be used to discuss local problems, solutions and activities.

Its use can be made more effective if service providers organise farmers into listening clubs and groups to have an in-depth discussion of agricultural broadcasts and give feedback to the programme producers. About 49 percent of the farmers depend on MoFA agents for information as shown in Table 44. Feder and Slade (1984) noted that extension agents and other informed persons were the knowledgeable other sources of information.

Only 28.2 percent of the farmers indicated that the TV was their source of information. Though TV is an effective audio-visual medium of communication, a low percentage of farmers depend on it for information due to its high cost and the unavailability of electricity in the rural areas. Less than 4.0 percent of the farmers get agricultural information from each of these sources: agricultural science teachers in the locality, retailers, newspapers/print media, truck drivers and wholesalers. It would be unthinkable for a relatively high proportion of farmers to mention newspapers/print media, since 97.5 percent of the farmers did not have formal education or were educated up to JSS/middle school level.

Monitoring and Evaluation

Table 45 shows the frequencies and percentages of farmers' perceived level of monitoring and evaluation activities undertaken by service providers. Out of 18 monitoring and evaluation activities, a sizeable percentage of the farmers rated 9 to be 'average', 7 to be 'high' and 2 to be 'very high'. Half of the M&E activities were rated by the farmers as 'average', implying that the extent of M&E was not up to their expectation. Over 50 percent of the farmers

said that service providers ensured timely credit delivery, use of credit for the right purpose, credit recovery and processing of produce and rated these as average implying more work ought to be done by the NGOs. The two monitoring and evaluation activities that the farmers perceived to be 'very high' were early planting (34.4%) and correct spacing (39.1%). The implication is that the farmers in the study area are likely to carry out these activities. This, coupled with timely arrival of inputs is likely to enhance farmers' performance and also increase yields. Few farmers, ranging from 0.7 to 17.9 percent, rated the extent of monitoring and evaluation by service providers as either 'low' or 'very low'.

Table 45: Farmers' perceptions about the extent of monitoring and
evaluation by NGOs

M&E Activities:	Very low		Low		Average		High		Very High	
	F	%	F	%	F	%	%	F	%	F
Ensuring:										
Timely credit delivery	18	7.7	38	16.2	120	51.3	43	18.4	15	6.4
Credit used for right purpose	14	6.2	32	14.2	115	50.9	60	26.5	5	2.2
Credit recovery	6	2.5	41	17.4	124	52.5	48	20.3	17	7.2
Inputs come on time	8	3.3	31	12.9	8	40.7	84	34.9	20	8.3
Adequacy of inputs	4	1.7	32	13.4	99	41.4	82	34.3	22	9.2
Good land preparation	2	1.3	14	9.3	36	24.0	67	44.7	31	20.7

Table 45: Cont.

Early planting	5	3.3	8	5.3	36	23.8	50	33.1	52	34.4
Correct spacing	1	0.7	7	4.6	30	19.9	54	35.8	59	39.1
Timely weed control	1	0.7	9	6.1	58	39.5	37	25.2	42	28.6
Fertilizer/ manure use	2	1.9	11	10.6	34	32.7	51	49.0	6	5.8
Pest control	6	5.8	14	13.6	51	49.5	28	27.2	4	3.9
Disease control	5	5.2	12	12.4	36	37.1	40	41.2	4	4.1
Collection of yield data	1	1.1	8	8.6	34	36.6	44	47.3	6	6.5
Processing	9	9.1	12	12.1	55	55.6	23	23.2	-	-
Storage and preservation	12	11.3	19	17.9	29	27.4	20	18.9	26	24.5
Availability of market facilities	14	13.5	13	12.5	29	27.9	43	41.3	5	4.8
Training objectives achieved	11	6.5	19	11.2	60	35.5	65	38.2	14	8.3
Clients get information regularly	9	5.7	8	5.1	31	19.6	71	44.9	39	24.7

n = 323 (multiple responses)

Source: Survey Data, 2007

Table 46 also shows the means and standard deviations of farmers' opinions on the extent to which the NGOs carried out their monitoring and evaluation activities. The various activities are arranged in descending order of means of responses. The results show that the farmers perceived the extent of

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monitoring and evaluation to be 'high' for the following activities: ensuring correct spacing, ensuring early planting, ensuring clients get information regularly, ensuring timely weed control and ensuring good land preparation. Though all these sub-items were rated as 'high', the one concerned with ensuring correct spacing was rated relatively higher. This may be due to the greater emphasis service providers place on it. It is probable that the inability of farmers to plant crops at the correct spacing is a major problem in the rural areas.

The overall mean shown in Table 46 indicates that the farmers perceived the extent of monitoring and evaluation by the NGOs to be 'average' (mean = 3.26, s.d. = 0.69), implying that the extent of M&E was not as high as they anticipated. This level of M&E might affect the progress, performance and effectiveness of the programme. The standard deviation (0.69) shows some level of uniformity in the views of the farmers as far as monitoring and evaluation is concerned.

Table 46: Means and standard deviations of farmers' opinions of the extent of monitoring and evaluation by NGOs

M&E Activities	N	Mean	s.d.
Ensuring correct spacing	151	4.08	0.91
Ensuring early planting	151	3.90	1.04
Ensuring clients get information regularly	158	3.78	1.06
Ensuring timely weed control	147	3.75	0.96
Ensuring good land preparation	150	3.74	0.94

Table 46: Cont.

Ensuring collection of yield data	93	3.49	0.79
Ensuring fertilizer/manure application	104	3.46	0.84
Ensuring adequacy of inputs	239	3.36	0.89
Inputs arrive on time	241	3.32	0.92
Ensuring training objectives are achieved	169	3.31	1.00
Ensuring storage and preservation	106	3.27	1.32
Ensuring disease control	97	3.27	0.92
Ensuring credit recovery	236	3.12	0.87
Ensuring availability of market facilities	104	3.12	1.13
Ensuring pest control	103	3.10	0.89
Ensuring credit is used for right purpose	226	3.04	0.86
Ensuring timely credit delivery	234	3.00	0.96
Ensuring processing of produce	99	2.93	0.85
Overall mean		3.26	0.69

n = 323 (multiple responses)

Scale: 1 = Very low   2 = Low   3 = Average

             4 = High   5 = Very high

Source: Survey Data, 2007

Almost all the managers used field observation as the method for monitoring and evaluation. The managers perceived the extent of monitoring

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and evaluation to be 'high' (mean = 3.63, s.d = 0.29). The standard deviation of 0.29 indicates that the managers were uniform in their responses.

From Table 47 all the managers perceived field supervision to have a 'positive' influence on monitoring and evaluation. The results also reveal that 75% to 100% of the managers indicated that logistics, budgetary resources, implementation of monitoring and evaluation findings and manpower and staff influenced their monitoring and evaluation activities 'positively' or 'very positively'. For M&E to be effective, logistics, budgetary resources, manpower and staff must be provided. Additionally, it is recommended that the findings of the M&E should be implemented and made known to stakeholders. A majority of the managers also perceived commitment of staff (80%), commitment of clients (80%) and adequate data processing equipment (75%) to exert 'positive' influence.

Table 47: Managers' perceptions about factors influencing monitoring and evaluation

Factors	N	Negatively		Neutral		Positively		V. positively	
		F	%	F	%	F	%	F	%
Field Supervision	5	0	0.0	0	0.0	5	100.0	0	0.0
Logistics	4	0	0.0	0	0.0	2	50.0	2	50.0
Commitment of staff	5	0	0.0	1	20.0	4	80.0	0	0.0
Commitment of clients	5	0	0.0	1	20.0	4	80.0	0	0.0
Budgetary resources	5	0	0.0	1	20.0	2	40.0	2	40.0

Table 47: Cont.

Implementation of M&E Findings	5	0	0.0	0	0.0	4	80.0	1	20.0
Manpower and staff	4	0	0.0	1	25.0	1	25.0	2	50.0
Analytical skills	5	2	40.0	1	20.0	2	40.0	0	0.0
Data processing equipment	4	1	25.0	0	0.0	3	75.0	0	0.0

n = 5

Scale: 1 = Very Negatively   2 = Negatively   3 = Neutral

4 = Positively   5 = Very positively

Source: Survey Data, 2007

Factors perceived by managers of NGOs to influence monitoring and evaluation

The means and standard deviations of the factors that influence the managers' ability to carry out monitoring and evaluation are shown in Table 48.

The means ranged from 3.00 to 4.50. The factor with the highest mean was logistics (mean = 4.50) and was perceived to influence monitoring and evaluation 'very positively'. Logistic support was ranked by the project managers as the foremost factor that could make the M&E effective. This was followed by manpower and staff (mean = 4.25, s.d = 0.96), implementation of monitoring and evaluation findings as well as budgetary resources (mean = 4.20) which were all perceived to influence monitoring and evaluation 'positively'. The managers, however, perceived analytical skills to have a

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'neutral' (mean = 3.00, s.d = 1.00) influence on monitoring and evaluation. Overall, the factors influenced monitoring and evaluation 'positively' (mean = 3.86, s.d = 0.49). This implies that the factors are not constraints to monitoring and evaluation in the student.

Table 48: Means and standard deviations of managers' perceptions about factors influencing the ability to carry out monitoring and evaluation

Factors	Frequency	Mean	s.d
Logistics	4	4.50	0.58
Manpower and Staff	4	4.25	0.96
Implementation of M&E findings	5	4.20	0.45
Budgetary resources	5	4.20	0.84
Field supervision	5	4.00	0.00
Commitment of clients	5	3.80	0.45
Commitment of staff	5	3.80	0.45
Data processing equipment	4	3.50	1.00
Analytical skills	5	3.00	1.00
Overall mean		3.86	0.49

n = 5

Scale: 1 = Very Negatively   2 = Negatively   3 = Neutral

4 = Positively   5 = Very positively

Source: Survey Data, 2007

Farmers perceptions of their levels of performance before and after NGO intervention

The results in Table 49 show the farmers' perception of their level of performance before the NGO intervention. Approximately 47 percent and 37 percent of the respondents perceived the yield to be "poor" and "fair" respectively while about 4 percent indicated that the yield was "very good". About 68 percent and 75 percent reported that income and quality of produce respectively were either "poor" or "fair". The farmers perceived food security (41.5%), weed control (36.2%) and use of fertilizer (45.2%) to be "poor" while land preparation (38.5%) was perceived to be "fair". The majority of the farmers perceived the levels of housing (70%) and feeding (62.5%) to be "poor". Apart from processing which 47.7 percent of the farmers perceived to be "good", disease and pest control(49.1%), storage and preservation (40.3%) and marketing (45.6%) were all perceived to be "poor". The results indicate that the farmers in the study area perceived the levels of performance to be generally 'poor' before the intervention.

A number of factors may be responsible for the 'poor' perception of their level of performance before the intervention. Firstly, the level of education of the farmers was low. This might affect their ability to carry out certain farm practices that required higher education. Secondly, inadequate technical knowledge for scientific farming. According to Baffour (1981), peasant farmers in West Africa use traditional methods of farming. Thirdly, inadequate capital to buy inputs which a substantial proportion of the farmers perceived to be expensive.

Table 49: Farmers' perception of their level of performance before NGO intervention

Variable	Poor		Fair		Good		V. Good		Excellent	
	F	%	F	%	F	%	F	%	F	%
Yield	137	46.6	106	36.1	37	12.6	13	4.4	1	0.3
Income	97	30.4	119	37.3	66	20.7	33	10.3	4	1.3
Quality of Produce	110	34.5	129	40.4	58	18.7	20	6.3	2	0.6
Food security	131	41.5	90	28.5	70	22.2	22	7.0	3	0.9
Weed Control	106	36.2	96	32.8	58	19.8	31	10.6	2	0.7
Use of Fertilizer	114	45.2	87	34.5	36	14.3	15	6.0	0	0.0
Land Preparation	84	29.7	109	38.5	56	19.8	21	7.4	13	4.6
Housing	7	70.0	0	0.0	2	20.0	1	10.0	0	0.0
Feeding	5	62.5	0	0.0	1	12.5	2	25.0	0	0.0
Disease & Pest Control	108	49.1	45	20.5	48	21.8	18	8.2	1	0.5
Storage & Preservation	95	40.3	64	27.1	49	20.8	24	10.2	4	1.7
Processing	27	24.3	20	18.0	53	47.7	11	9.9	0	0.0
Marketing	115	45.6	57	22.6	62	24.6	16	6.3	2	0.8

n = 323 (multiple responses)

Source: Survey Data, 2007

As shown in Table 50, the managers' perceptions of the level of farmers' performance before the intervention were either "poor" or "fair" for all the variables.

Table 50: Managers' perceptions of the level of farmers' performance before NGO intervention

Variable	Poor		Fair		Good	
	F	%	F	%	F	%
Yield	1	25.0	3	75.0	0	0.0
Income	1	25.0	3	75.0	0	0.0
Quality of Produce	3	75.0	1	25.0	0	0.0
Food security	2	50.0	2	50.0	0	0.0
Weed Control	1	33.3	2	66.7	0	0.0
Use of Fertilizer	3	100.0	0	0.0	0	0.0
Land Preparation	0	0.0	4	100.0	0	0.0
Housing	1	33.3	2	66.7	0	0.0
Feeding	0	0.0	3	100.0	0	0.0
Disease & Pest Control	3	75.0	1	25.0	0	0.0
Storage & Preservation	3	60.0	1	20.0	1	20.0
Processing	2	40.0	3	60.0	0	0.0
Marketing	1	20.0	3	60.0	1	20.0

n = 5

Source: Survey Data, 2007

The farmers were also asked to rate their level of performance after the intervention. The results are shown in Table 51. Approximately, 37 percent and 45 percent of the farmers perceived the yield to be "good" and "very

good" respectively while 10 percent perceived it to be "fair". About 56"«
reported that income was at least "very good" (very good = 42.3%, excellent =
14.1%). A sizeable proportion of the farmers perceived quality of produce
(45.1%) to be 'very good" while food security (41%) was perceived to be
"good". Again, a sizeable percentage of the farmers perceived weed control
(35.2%), land preparation (35.8%), housing (40%), storage and preservation
(28.6%), processing (29.8%), and marketing (25.6%) to be "very good". Use
of fertilizers (25.4%), feeding of animals (30%), disease and pest control
(35.7%) were perceived by the farmers to be "good". The results show that
there was improvement in the levels of performance after the NGO
intervention implying that the programme was effective.

Table 51: Farmers' perceptions of their level of performance after NGO
intervention

Variable	Poor		Fair		Good		V. Good		Excellent	
	F	%	F	%	F	%	F	%	F	%
Yield	8	2.8	28	9.7	106	36.6	130	44.8	18	6.2
Income	5	1.6	25	7.8	109	34.2	135	42.3	45	14.1
Quality of										
Produce	3	0.9	28	8.8	116	36.4	144	45.1	28	8.8
Food security	5	1.6	43	13.7	129	41.0	103	32.7	35	11.1
Weed Control	6	2.0	24	8.2	86	29.4	103	35.2	74	25.3
Use of Fertilizer	53	21.0	41	16.3	64	25.4	62	24.6	32	12.7
Land										
Preparation	40	14.2	25	8.9	77	27.3	101	35.8	39	13.8
Housing	-	-	1	10.0	3	30.0	4	40.0	2	20.0

	F	%	F	%	F	%	F	%	F	%
Feeding	1	10.0	2	20.0	3	30.0	2	20.0	2	20.0
Disease & Pest Control	50	22.6	46	20.8	79	35.7	34	15.4	12	5.4
Storage & Preservation	49	20.9	50	21.4	51	21.8	67	28.6	17	7.3
Processing	10	8.8	11	9.6	33	28.9	34	29.8	26	22.8
Marketing	63	25.2	51	20.4	57	22.8	64	25.6	15	6.0

n = 323

Source: Survey Data, 2007

A similar trend was observed in the perceptions of the managers of the NGOs (Table 52). Generally, the managers perceived the level of farmers' performance to be either "good" or "very good" after the intervention.

Table 52: Managers' perceptions of the level of farmers' performance after NGO intervention

Variable	Fair		Good		V. Good		Excellent	
	F	%	F	%	F	%	F	%
Yield	0	0.0	1	25.0	3	75.0	0	0.0
Income	0	0.0	2	·50.0	2	50.0	0	0.0
Quality of Produce	0	0.0	1	25.0	3	75.0	0	0.0
Food security	0	0.0	1	25.0	1	25.0	2	50.0
Weed Control	0	0.0	0	0.0	3	100.0	0	0.0
Use of Fertilizer	0	0.0	1	33.3	2	66.7	0	0.0

Table 52: Cont.

Land Preparation	0	0.0	3	100.0	0	0.0	0	0.0
Housing	0	0.0	1	25.0	1	25.0	2	50.0
Feeding	0	0.0	1	33.3	2	66.7	0	0.0
Disease & Pest Control	0	0.0	1	25.0	3	75.0	0	0.0
Storage & Preservation	1	20	0	0.0	2	40.0	2	40.0
Processing	0	0.0	2	50.0	2	50.0	0	0.0
Marketing	0	0.0	1	20.0	4	80.0	0	-

n = 5

Source: Survey Data, 2007

Table 53 provides the paired sample t-test of the perceived effects of NGO interventions on agriculture before and after the intervention. Before the intervention, all the items were perceived by the respondents to be 'fair', with means ranging from 1.76 to 2.45. The item that was rated the least was yield (mean = 1.76) and the one rated the highest was processing (mean = 2.45). The low yield of produce implied inefficiency of production and this may affect the income and welfare of farmers. However, a higher mean score for processing indicated the addition of value to produce and consequent preservation which could affect the income levels of the farmers.

After the intervention, the respondents perceived an improvement in all the sub-scales (Table 53). Generally, the effects of NGO intervention on all the 13 variables were perceived by the respondents to be 'good' with means

ranging from 2.61 to 3.42 or 'very good' with means ranging from 3.50 to

3.73. The results imply that the programme was effective.

Table 53: Paired (dependent) sample t-test of effects of NGO
interventions on agriculture before and after the intervention

| Item | Mean Response | | | | m.d | t-ratio | sig. |
| | Before | | After | | | | |
	Mean	s.d.	Mean	s.d.			
Yield	1.76	0.86	3.42	0.85	1.660	24.28	0.000
Income	2.14	1.01	3.59	0.88	1.449	19.22	0.000
Quality of produce	1.99	0.91	3.52	0.81	1.530	24.68	0.000
Food security	1.98	1.00	3.38	0.91	1.402	20.73	0.000
Weed control	2.07	1.02	3.73	1.00	1.660	23.00	0.000
Use of fertilizer/ manure	1.81	0.90	2.90	1.32	1.089	14.91	0.000
Land preparation	2.17	1.08	3.27	1.21	1.099	16.89	0.000
Housing of animals	1.88	1.25	3.63	1.06	1.750	3.33	0.013
Feeding of animals	2.33	1.51	3.00	1.41	0.667	1.20	0.286
Disease & Pest Control	1.92	1.04	2.61	1.16	0.696	9.42	0.000
Storage &							

Table 53:Cont.							
Preservation	2.07	1.09	2.81	1.26	0.748	9.85	0.000
Processing	2.45	0.97	3.50	1.21	1.046	8.68	0.000
Marketing	1.94	1.01	2.67	1.27	0.728	10.50	0.000
Overall mean	2.03	0.75	3.26	0.72	1.146	26.22	0.000

n = 323   p < 0.05

Scale: 1 = Poor   2 = Fair   3 = Good   4 = Very Good

       5 = Excellent

Source: Survey Data, 2007

The respondents perceived the following five items after the NGO intervention to be 'very good': income (mean = 3.59), quality of produce (mean 3.52), weed control (mean = 3.73), animal housing (mean = 3.63) and processing (mean = 3.50). The weed control measures probably contributed to an increase in yield, enhanced income and quality of produce. However, before the intervention, farmers' income (mean = 2.14), quality of produce (mean = 1.99), weed control (mean = 2.07), animal housing (mean = 1.88) and processing (mean = 2.45) were all perceived to be 'fair'.

Overall, the mean score before the intervention was 'fair' (mean = 2.03. s.d = 0.75) while after the intervention it was perceived to be 'good' (mean = 3.26, s.d. = 0.72) indicating that the intervention enhanced their performance.

There was a significant change. in the perceived effects in all the variables except feeding of animals as illustrated in Table 53. There was statistically significant (0.000) difference between the yield before the intervention (mean 1.76, s.d. = 0.86) and after the intervention (mean = 3.42, s.d. = 0.85) at 0.05 alpha level. There was again significant (0.000) difference between the income of respondents before the intervention (mean = 2.14, s.d.

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= 1.01) and after the intervention (mean = 3.59, s.d. = 0.88). This means that the programme was effective in increasing the yield and income of the farmers.

Effect on livelihood

The study also examined the farmers' ability to provide basic needs for the family and the results are reported in Table 54. The farmers, who indicated that their income status had improved following NGO intervention, said that they were able to provide their basic needs.

Table 54: Farmers' livelihood

Livelihood	Yes		No		Don't know	
	Freq	%	Freq	%	Freq	%
Ability to pay school fees	307	95.0	14	4.3	2	0.6
Ability to pay family's health needs	281	88.1	26	8.2	12	3.8
Ability to provide good clothing	208	82.9	21	8.4	22	8.8
Ability to provide family with more food	242	75.4	36	11.2	43	13.4
Ability to provide decent house	173	54.6	102	32.2	42	13.2

n = 323

Source: Survey Data, 2007

Most (95.0%) of the farmers said they could afford to pay their children's school fees. The possible explanations are that the farmers may have either a high interest in their wards' education or that the school fees were affordable. The result is also not surprising since about 61 percent of the farmers had at least primary education. The majority (88.1%) of the farmers

said they could afford to pay for the health needs of the family while 82.9 percent of farmers said they could afford to provide good clothing for the family. In terms of providing more food for the family, 75.4 percent of the farmers indicated that they were capable of doing so.

It appears that the farmers interviewed found it more difficult feeding the family than providing school fees, health needs and clothing, even though they produce some of the foodstuffs. This situation may be attributed to the small scale of production or the expenditure on other items they need to purchase to prepare meals for the family.

About 55 percent of the farmers indicated that they could provide decent housing for the family. This was the least ranked probably because the cost of providing decent housing compared to the other needs was higher. Few farmers, ranging from 0.6 to 13.4 percent, reported that they did not know whether they could afford to pay for the basic needs. On the whole, the farmers perceived that the programme was able to improve all the aspects of their livelihood.

All the project managers said the farmers could afford to pay school fees and provide the health, food and clothing needs of the family. Only 40 percent of the managers were of the view that the farmers could provide decent housing.

A crosstabulation of the characteristics of the farmers with the various categories of their livelihood are summarized in Table 55. With regard to education, a relatively larger proportion, 48.3% to 50.5%, of the farmers who had attained JSS/Middle school education excelled in their ability to afford all the five basic necessities.

Similarly, in terms of age and Municipality, a relatively larger proportion of the farmers aged 40-49years and those from Mfantsiman Municipality respectively claimed they could afford all the five basic necessities. This suggests that the intervention resulted in greater income levels for these farmers than the rest of the farmers.

The results also show that the female farmers dominated the male farmers in four categories of livelihood, namely: school fees, health needs, decent house and more food. This may be due to the higher income levels of the female farmers. A larger proportion (52.4%) of male farmers, however, claimed they could afford good clothing.

The majority (72.8%) of the farmers who could afford decent housing were from Mfantsiman Municipality. It appears that the intervention had boosted their income greatly. As a result, they will want a better place to live their life more conveniently, more comfortably, more healthfully and more enjoyably (Strow, 1981).

Table 55: Characteristics of farmers by livelihood

Characteristic Municipality	Able to afford				
	School fees F	Health needs F	Good clothing F	Decent house F	More food F
Education					
No education	115(38.1)	110(39.9)	78(38.2)	64(37.4)	93(39.1)
Primary	29 (9.6)	27(9.8)	18(8.8)	17(9.9)	24(10.1)
JSS/Middle	151(50.0)	136(49.3)	103(50.5)	86(50.3)	115 (48.3)
Sec/Tech	5 (1.7)	2 (0.7)	3 (1.5)	3 (1.8)	4 (1.7)
Tertiary	2 (0.7)	2 (0.4)	2 (1.0)	1 (0.6)	2 (0.8)
Total	302(100.0)	276(100.0)	204(100.0)	171(100.0)	238(100.0)

Table 55: Cont.

Age (yrs)	18 (6.0)	15(5.4)	8 (3.9)	11 (6.5)	16 (6.8)
20 – 29	94(31.1)	80(29.0)	65 (31.6)	52(31.0)	68 (28.7)
30 – 39	99(32.8)	95(34.4)	70(34.0)	55 (32.7)	77 (32.5)
40 – 49	60(19.9)	56(20.3)	44(21.4)	28 (16.7)	50 (21.1)
50 – 59	31 (10.3)	30(10.9)	19 (9.2)	22 (13.1)	26 (11.0)
> 59					
Total	302(100.0)	276(100.0)	206(100.0)	168(100.0)	237(100.0)
Sex					
Male	144(47.2)	134(48.0)	109(52.4)	79 (46.2)	113 (47.1)
Female	161(52.8)	145(52.0)	99(47.6)	92(53.8)	127 (52.9)
Total	305(100.0)	279(100.0)	208(100.0)	171(100.0)	240(100.0)
Municipality					
Mfantsiman	172(56.0)	159(56.6)	105(50.5)	126 (72.8)	142 (58.7)
KEEA	135(44.0)	122(43.4)	103(49.5)	47(27.2)	100 (41.3)
Total	307(100.0)	281(100.0)	208(100.0)	173(100.0)	242(100.0)

Note: The figures in parentheses are row percentages.

Source: Survey Data, 2007

Relationship between farmers' perceived effects of NGO interventions and some variables of the study

Pearson product-moment correlation coefficients (r) showing the relationships between perceived effects of NGO interventions and eight main variables of the study (education, farming experience, size of crop production enterprise, adequacy of credit, input, training, technology transfer and

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agricultural information) are presented in Table 56 and discussed based on Davis convention (Appendix I).

The results show that there was a positive relationship between farmers' perceived effects of NGO interventions and level of education ($r = 0.094$). This means that farmers with higher education, perceived the intervention to have had a positive effect on their work. The relationship, however, was not significant.

The first null hypothesis which stated that "there is no significant relationship between the level of education of clients and the perceived effect of NGO interventions" was accepted.

Table 56: Pearson Correlation Matrix of farmers' perceived effects of NGO interventions and demographic/farm-related characteristics and NGO support services

	Y	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
X_1	.094											
X_2	-.262(**)	-.328(**)										
X_3	-.163-(**)	.045	.050									
X_4	-.065(**)	.273(*)	-.396(**)	.121								
X_5	.100(**)	-.061	.232(**)	-.070	.(a)							
X_6	.137(*)	.002	.185(**)	-.089	.464(**)	.633(**)						
X_7	.115	-.047	.300(**)	-.133	.424	.602(**)	.669(**)					
X_8	.028	-.092	.256(**)	-.093	.448	.652(**)	.562(**)	.581(**)				
X_9	-.102	-.460(**)	.156(**)	-.055	-.255(*)	-.020	-.046	.126	-.031			
X_{10}	-.045	-.338(**)	.513(**)	-.015	-.146	.020	.076	.043	.131(*)	.106		
X_{11}	-.249(**)	-.115(*)	.429(**)	-.098	.041	.111	.038	.162(*)	.179(**)	.146(*)	-.136(*)	
X_{12}	.004	-.224(**)	.429(**)	-.006	-.385(**)	.184(**)	.114(*)	.266(**)	.197(**)	.111(*)	.261(**)	.092

xx Correlation is significant at the 0.01 level (2-tailed) i.e. p<0.05 (2 tailed)

x Correlation is significant at the 0.05 level (2-tailed) i.e. p< 0.05 (2-tailed)

Y   Perceived effects of NGO intervention

X_1 Level of education

X_2 Farming experience

X_3 Size of crop enterprise

X_4 Adequacy of credit

X_5 Adequacy of input

X_6 Adequacy of training

X_7 Adequacy of technology transfer

X_8 Adequacy of information support

X_9 Sex

X_{10} Age

X_{11} Social status

X_{12} Type of enterprise

Source: Survey Data, 2007

The results also show negative and low significant relationship between farmers' perceived effects of NGO interventions and farming experience ($r = -0.262^{xx}$), at the 0.01 level. The result. could be interpreted to mean that the richer the farming experience, the poorer the farmers perceived the effects of NGO interventions. This implies that farmers with rich farming experience did not perceive the intervention to improve their performance. It is possible that the perceived effects of the intervention did not match up to the expectations

of the more experienced respondents. However, farmers with less experience perceived the intervention to improve their performance.

The second null hypothesis which stated that "there is no significant relationship between the farming experience of clients and the perceived effect of NGO intervention" was rejected. The alternative hypothesis was therefore accepted. Additionally, there was a statistically significant negative relationship between farmers' perceived effects of NGO intervention and the size of crop enterprises ($r = -0.163^{xx}$) at the 0.01 level. The interpretation of this relationship is that farmers who have larger crop enterprises, perceived the effects of the NGO interventions on their performance to be poorer than those who have smaller enterprises. The level of the perceived effects of the programme was below the expectations of the larger farmers. On the other hand, farmers with smaller farms perceived the effects of the intervention to be good. The implication of the relationship is that the small size of the crop enterprise was important in enhancing the effect of the intervention on farmers' performance.

The results show that there was a negative and low significant relationship between sex ($r = -0.102$) and the perceived effect of NGO intervention and a negative and negligible relationship between age ($r = -0.045$) and the perceived effect of the intervention. The relationships, however, were not significant. The third null hypothesis which stated that "there is no significant relationship between sex and the perceived effect of NGO intervention" was accepted. Similarly, the fourth null hypothesis which stated that "there is no significant relationship between age and the perceived effect of the NGO intervention" was accepted.

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Farmers' perception of NGO interventions on their performance correlated positively with social status (r = 0.249**), adequacy of input (r = 0.100**), adequacy of training (r = 0.137*), adequacy of technology transfer (r = 0.115), adequacy of agricultural information (r = 0.028) and type of enterprise (r = 0.004). The results also show positive and low significant relationship between farmers' perceived effect of NGO interventions and social status (r = 0.249**) at the 0.01 alpha level. This implies that farmers with high social status perceived the intervention to improve their performance. The fifth null hypothesis which stated that "there is no significant relationship between the social status of clients and the perceived effect of NGO intervention" was rejected. The alternative hypothesis was accepted.

There was a positive relationship between farmers' perceived effect of the intervention and the type of enterprise. The relationship was not significant. We, therefore, fail to reject the sixth null hypothesis which stated that "there is no significant relationship between type of enterprise and the perceived effect of NGO interventions.

The relationship between farmers' perceived effects of NGO interventions and adequacy of training was low but significant at the 0.05 alpha level. The implication of the relationship is that farmers with adequate training would perceive a positive increase in the effect of NGO intervention on their agricultural activities. Consequently, NGOs should always ensure that their clients receive adequate training.

Comparison of farmers' perceived effects of NGO interventions on agriculture in the Mfantsiman and KEEA municipalities

Table 57 shows that the mean scores for Mfantsiman Municipality were lower than those for KEEA Municipality for almost all the variables except yield and housing of animals before the intervention. The overall mean scores for Mfantsiman Municipality and KEEA Municipality before the intervention was 'fair' with mean scores of 1.82 and 2.29 respectively. The mean score of 1.82 for Mfantsiman Municipality indicates the need for increased efforts at improving the perceived effects of NGO intervention in Mfantsiman Municipality.

The farmers in both municipalities perceived almost all the variables to be 'fair' as indicated by the mean scores. However, the farmers in KEEA Municipality perceived four variables namely land preparation, storage and preservation, processing and marketing to be 'good' while farmers in the Mfantsiman Municipality perceived the same variables to be 'fair'. The high standard deviations indicate that the farmers in both municipalities were not uniform in their opinions on land preparation. Also, the farmers in KEEA Municipality were not uniform in their opinions on storage and preservation as indicated by the standard deviation of 1.046. The means scores of eight variables posted significant differences between the two municipalities before the intervention (Table 57).

It can be seen that there was a significant difference between Mfantsiman Municipality (mean = 1.85, s.d = 0.893) and KEEA Municipality (mean = 2.16, s.d = 0.914) in respect of quality of produce. The p-value of 0.002 obtained is less than the specified alpha level of 0.05. The quality of

produce was slightly better in KEEA Municipality than in Mfantsiman Municipality. The lower mean score for Mfantsiman Municipality indicates the need for increased efforts by NGOs at improving the perception of quality in Mfantsiman Municipality.

The p-values obtained for weed control (p = 0.020), use of fertilizer/manure (p = 0.000), land preparation (p = 0.000), disease and pest control (p = 0.000), storage and preservation (p = 0.000), processing (p = 0.037) and marketing (p = 0.000) were all lower than the specified alpha level of 0.05. This means that significant differences existed between Mfantsiman Municipality and KEEA Municipality with regard to these variables. The implication is that the farmers in KEEA Municipality perceived the level of their performance with regard to these variables to be better than their counterparts in the Mfantsiman Municipality before the intervention.

The results in Table 57 also show that there were no significant differences between Mfantsiman Municipality and KEEA Municipality in respect of yield, income, food security and housing of animals before the intervention. All the p-values obtained were greater than the specified alpha level of 0.05. The results indicate that efforts at improving any of these variables must be directed equally at both municipalities.

Table 57: Independent sample *t*-test comparison of farmers' perceived

levels of performance in the two study municipalities before the

intervention

Variable	Municipality	Before				
		Mean	s.d.	m.d	t-ratio	sig.
Yield	Mfantsiman	1.82	0.978	0.163	1.722	0.086
	KEEA	1.66	0.643			
Income	Mfantsiman	2.06	1.009	0.198	1.742	0.083
	KEEA	2.26	1.002			
Quality of produce	Mfantsiman	1.85	0.893	0.314	3.080	0.002
	KEEA	2.16	0.914			
Food security	Mfantsiman	1.90	0.889	0.174	1.495	0.136
	KEEA	2.07	1.123			
Weed control	Mfantsiman	1.95	0.952	0.283	2.344	0.020
	KEEA	2.24	1.099			
Use of fertilizer/ Manure	Mfantsiman	1.63	0.834	0.554	4.800	0.000
	KEEA	2.18	0.904			
Land preparation	Mfantsiman	1.96	1.017	0.563	4.436	0.000
	KEEA	2.52	1.095			
housing	Mfantsiman	1.78	1.202	0.778	0.614	0.556
	KEEA	1.00	-			
Feeding	Mfantsiman	2.00	1.414	-	-	-
	KEEA	-	-			

Disease &	Mfantsiman	1.75	0.911	0.693	3.651	0.001
Pest Control	KEEA	2.44	1.248			
Storage &	Mfantsiman	1.68	0.898	1.086	8.350	0.000
Preservation	KEEA	2.77	1.046			
Processing	Mfantsiman	2.16	1.014	0.405	2.111	0.037
	KEEA	2.57	0.923			
Marketing	Mfantsiman	1.63	0.874	1.041	8.382	0.000
	KEEA	2.68	0.952			
Overall mean	Mfantsiman	1.82	0.704	0.464	5.827	0.000
	KEEA	2.29	0.718			

n = 323 $p < 0.05$

Scale: 1 = Poor   2 = Fair   3 = Good   4 = V. Good   5 = Excellent

Source: Survey Data, 2007

Table 58 also shows the independent t-test comparison of farmers' perceived effects of NGO interventions in the two municipalities after the intervention. Mfantsiman Municipality once again had lower mean scores for all the 13 variables except one, namely feeding of farm animals.

The mean scores for all the variables in the two municipalities were higher after the intervention than before the intervention. Prior to the intervention, all the variables were perceived by the farmers to be 'fair' while four of the variables were perceived by the farmers in KEEA Municipality to be 'good'. After the intervention, however, all the variables were perceived by the farmers to be 'good' or 'very good'. Only three variables, use of fertilizer/manure, disease and pest control and marketing were perceived by

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the farmers in Mfantsiman Municipality to be 'fair'. The results therefore show a general improvement in the performance of the farmers in the two municipalities.

There was improvement in the yields of farmers in the two municipalities from 'fair' before the intervention to 'good' in the Mfantsiman Municipality and 'very good' in the KEEA Municipality. Similarly, there was improvement in the quality of produce from 'fair' in both municipalities to 'good' in Mfantsiman Municipality and 'very good' in the KEEA Municipality. The higher perceived yield and quality of produce in the KEEA Municipality might be due to the higher perceived weed control, fertilizer/manure use, land preparation and disease and pest control in the Municipality compared to Mfantsiman Municipality. Various studies show that yields and quality of produce are enhanced by weed control, fertilizer/manure application, good land preparation and disease and pest control (El-Akhrass, 1987; Akinyosoye, 1984; IITA, 1990; Fakorede, 1982). Increased effort would be needed from the NGOs to ensure improvement in the use of fertilizer/manure and disease and pest control from 'fair' to 'good' or 'very good'. It is interesting to note that farmers in the Mfantsiman and KEEA municipalities perceived marketing to be 'fair' and 'good' respectively before and after the intervention. It appears that the farmers have difficulty in selling their produce. Dankwa (2004) reported that 41.5% of the farmers in Ashanti region had difficulty in selling their produce. The farmers attributed the situation to unavailability of market, perishability of their produce and unstable prices.

Table 58: Independent sample t-test comparison of farmers' perceived effects of NGO interventions in the two study municipalities after the intervention

| Variable | Municipality | After | | | | |
		Mean	s.d.	m.d	t-ratio	sig.
Yield	Mfantsiman	3.13	0.888	0.744	8.779	0.000
	KEEA	3.87	0.554			
Income	Mfantsiman	3.56	0.935	0.092	0.924	0.356
	KEEA	3.65	0.806			
Quality of produce	Mfantsiman	3.37	0.865	0.340	3.893	0.000
	KEEA	3.71	0.694			
Food security	Mfantsiman	3.32	0.854	0.147	1.428	0.154
	KEEA	3.46	0.975			
Weed control	Mfantsiman	3.42	0.996	0.786	7.509	0.000
	KEEA	4.20	0.791			
Use of fertilizer/ Manure	Mfantsiman	2.48	1.192	1.386	8.828	0.000
	KEEA	3.86	1.088			
Land preparation	Mfantsiman	2.71	1.186	1.371	12.000	0.000
	KEEA	4.08	0.730			
Housing	Mfantsiman	3.67	1.000	0.333	0.316	0.760
	KEEA	4.00	-			
Feeding	Mfantsiman	3.22	1.394	0.222	0.151	0.884
	KEEA	3.00	-			
Disease & Pest Control	Mfantsiman	2.48	1.211	0.564	3.869	0.000
	KEEA	3.04	0.789			
Storage & preservation	Mfantsiman	2.43	1.298	1.084	7.830	0.000
	KEEA	3.51	0.811			
Processing	Mfantsiman	3.08	1.385	0.628	2.743	0.007
	KEEA	3.70	1.030			
Marketing	Mfantsiman	2.38	1.269	0.911	6.765	0.000
	KEEA	3.37	0.950			

Table 58: Cont

Overall mean	Mfantsiman	2.94	0.657	0.749	10.887	0.000
	KEEA	3.68	0.551			

n = 323   p < 0.05

Scale: 1 = Poor   2 = Fair   3 = Good   4 = V. Good   5 = Excellent

Source: Survey Data, 2007

In spite of the marketing problems that the farmers in Mfantsiman Municipality faced, their income was at par with the farmers in KEEA Municipality. (Table 58). This might be due to the improvement in perceived processing of the produce as shown in Table 58. Processing makes the produce shelf-stable and also increases the cash income of farmers (Ndi, 1993).

After the intervention, however, the mean score for Mfantsiman Municipality was 'good' (mean = 2.94 s.d. = 0.657) and for KEEA Municipality it was 'very good' (mean = 3.68, s.d. = 0.551). The perceived effect of the intervention was higher in KEEA Municipality. This might suggest that the farmers in KEEA Municipality tended to adopt NGOs advice more than the farmers in the Mfantsiman Municipality implying that the intervention was more effective in KEEA Municipality than in Mfantsiman Municipality.

An independent t-test was run to determine whether there was a significant difference between Mfantsiman Municipality and KEEA Municipality in terms of the sub-item scores and farmers' perceived effects of NGO interventions. The result of the t-test run at alpha level of 0.05 showed that yield, quality of produce, weed control, use of fertilizer/manure, land

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preparation, disease and pest control, storage and preservation and marketing registered significant mean differences between the two municipalities (Table 58).

With regard to the yield, the p-value of 0.000 obtained is lower than the specified alpha level of 0.05. This means that there was a significant difference in the mean scores between Mfantsiman Municipality (mean = 3.13, s.d = 0.888) and KEEA Municipality (mean = 3.87, s.d = 0.554). The significant difference in the perceived yields in the two municipalities implied that the differences were not due to chance.

The p-values for quality of produce, weed control, use of fertilizer/manure, land preparation, disease and pest control, storage and preservation and marketing were all 0.000, and for processing, 0.007. This means that there were significant differences in the mean scores between Mfantsiman Municipality and KEEA Municipality with regard to these variables. The implication is that farmers in the KEEA Municipality perceived the effects of the intervention on these variables to be higher than in the Mfantsiman Municipality.

The results in Table 58 also show that there were no statistically significant differences between Mfantsiman and KEEA municipalities in respect of income, food security, housing and feeding. All the p-values obtained were greater than the specified alpha level of 0.05.

The results also revealed that there were significant (0.000) differences between the perceptions of farmers in the Mfantsiman Municipality and KEEA Municipality about the effects of the intervention at alpha level of 0.05. The seventh null hypothesis which stated that "there is no significant

difference in the perception of clients in the two municipalities on the variables in the study" was rejected. The alternative hypothesis was therefore accepted.

Comparison of male and female farmers' perceived effects of NGO interventions on agriculture

Table 59 presents means and standard deviations of male and female farmers' perceived effects of NGO interventions on agriculture as well as an independent t-test between male and female farmers' perceived effects of the intervention. The means show that both male (mean = 1.99, s.d. = 0.646) and female (mean = 2.07, s.d. = 0.821) farmers perceived the effects of NGO interventions on their farm work to be 'fair'. After the intervention both male (mean = 3.35, s.d. = 0.667) and female (mean = 3.20, s.d. = 0.748) farmers in the study area perceived the effects of the intervention to be 'good'. However, the males perceived the effects of the intervention to be slightly better than females though insignificantly.

Table 59: Independent sample t-test between male and female farmers' perceptions of NGO interventions

Perceived Effect	Sex	Mean	s.d.	T	sig.
Before	Male	1.99	0.646	0.898	0.370
	Female	2.07	0.821		
After	Male	3.35	0.667	1.832	0.068
	Female	3.20	0.748		

n = 323 $p < 0.05$

Scale: 1 = Poor   2 = Fair   3 = Good   4 = V. Good   5 = Excellent

Source: Survey Data, 2007

The independent t-test, however, shows that there was no significant (sig 0.068) difference between the male and female farmers' perceptions of the effects of NGOs interventions at 0.05 alpha level. This means that the intervention was good for both male and female farmers. We, therefore, fail to reject the null hypothesis which stated that "there is no significant difference between male and female farmers' perceptions of NGO interventions on agriculture".

This may be explained by the fact that the intervention might have met the expectations of both male and female farmers. Since all the farmers benefited from the various services provided by the NGOs, we could rule out bias due to gender.

Working relationship

The following section presents results of the working relationship between service providers and their clients, including factors contributing to a good working relationship, constraints as well as recommendations for improving the relationship.

Extent of the working relationship

The respondents were asked to rate the working relationship with the service providers using a 5-point Likert scale ranging from 1 = poor to 5 = excellent. The results are presented in Table 60.

Table 60: Farmers' perceptions about their working relationship with
NGOs

Working relationship	Frequency	Percent
Poor	4	1.3
Fair	36	11.5
Good	107	34.2
Very Good	94	30.0
Excellent	72	23.0
Total	313	100.0

n = 323

Source: Survey Data, 2007

Fifty three percent of the respondents rated the working relationship with their service providers to be at least 'very good' (very good = 30% and excellent = 23%) while 34.2 percent indicated that it was good. This finding is confirmed by Gibbs et al. (1999) who said that close working relationships are clearly critical to project success. The rest of the respondents (12.8%) reported that their working relationship with the service providers was either 'poor' or 'fair'. The results in Table 61 show that both farmers and managers (means = 3.62 and 3.80 respectively) generally perceived the working relationship with the service providers to be 'very good'..The implication is that the programme would be efficient and sustainable.

Table 61: Farmers' and managers' perceptions about working

relationship with each other

Item	N	Mean	s.d
Farmers' perception about working relationship with service providers	313	3.62	1.003
Service providers' perception about working relationship with farmers	5	3.80	0.45

Scale: 1 = Poor   2 = Fair   3 = Good   4 = V. Good   5 = Excellent

Source: Survey Data, 2007

Factors contributing to a good working relationship

Frequency distribution of factors enumerated by respondents to contribute to a good working relationship is presented in Table 62. The results reveal that 78 percent of the respondents considered friendliness to be a contributory factor to a good working relationship with service providers. It is the major factor mentioned by majority of respondents.

A substantial proportion also mentioned mutual respect (48.6%) and credibility (46.4%). The result from the study also indicated that while about 31 percent of the respondents claimed that commitment of service providers contributed to a good working relationship, a substantial percentage (about 69%) said it did not.

Table 62: Distribution of farmers by factors perceived to contribute to a good working relationship

Factors	Yes		No	
	Freq.	Percent	Freq.	Percent
Friendliness	252	78.0	71	22.0
Mutual respect	157	48.6	166	51.4
Credibility/Trustworthiness	150	46.4	173	53.6
Competence of service provider	127	39.3	196	60.7
Transparency of service provider	115	35.6	208	64.4
Commitment of service provider	100	31.1	222	68.9

n = 323 (multiple responses)

Source: Survey Data, 2007

Table 63 shows the factors perceived by the managers to contribute to a good working relationship. All the managers were of the view that friendliness and mutual respect were the most important factors contributing to a good working relationship with their clients. This trend is consistent with that of the farmers (Table 62).

Table 63: Distribution of managers by factors perceived to contribute to a good working relationship

Factors	Yes		No	
	Freq	%	Freq	%
Friendliness	5	100	-	-
Mutual respect	5	100	-	-
Commitment of service providers	3	60	2	40
Credibility / trustworthy	2	40	3	60
Competence of service provider	1	20	4	80
Transparency	1	20	4	80

n = 5

Source: Survey Data, 2007

Constraints to a good working relationship

The farmers interviewed mentioned a variety of factors they considered to be constraints to a good working relationship between them and service providers. Factors perceived as constraints by all (100%) of the farmers included rejection of clients' views, coercion by service provider, complaining, lack of respect, argument, mistrust, backbiting and prejudice (Table 64). Misunderstanding and unreliability/deception were least mentioned although indicated by 97.4% and 95.8% respectively.

Table 64:   Factors perceived by farmers to be constraints to good
working relationship

Factors serving as constraints	Percent
Rejection of clients views	100.0
Coercion by service provider	100.0
Complaining	100.0
Lack of respect	100.0
Argument	100.0
Mistrust	100.0
Backbiting	100.0
Prejudice	100.0
Misunderstanding	97.4
Unreliability/deception	95.8

n = 323 (multiple responses)

Source: Survey Data, 2007

The factors perceived by the project managers to constrain their working relationship with the clients are shown in Table 65. The factors that mostly served as constraints were misunderstanding (60%), unreliability/deception (40%) and complaining (40%). Dankwa (2004), however, reported that 73.2% of the farmers in Ashanti Region found AEAs to be reliable and consequently put their confidence in them. This level of reliability enhanced AEAs working relationship with the farmers and improved the programme.

The results of this study are supported by Lowe (2004) who reported that complaining and backbiting fertilize hostility and poison a relationship and that the quickest way to lose a relationship is to win an argument.

Table 65: Factors perceived by the managers to be constraints to good working relationship

Factors	%
Misunderstanding	60
Unreliability / deception	40
Complaining	40
Coercion	20
Rejection of views	20
Backbiting	20
Argument	0
Mistrust	0
Lack of respect	0
Prejudice	0

n = 5

Source: Survey Data, 2007

Recommendations for improving working relationship

Recommendations made by the farmers for improving their working relationship with service providers are presented in Table 66. The majority (61.3%) of the farmers recommended that they should be given increased financial assistance, followed by frequent visits (58.2%) and timely supply of inputs (56.7%).

These are the only three recommendations given by more than 50 percent of the respondents. These recommendations relate to two main items, inputs (cash and kind) and frequent visits. It is not surprising that the majority of the farmers mentioned cash input, since farmers' rating of adequacy of cash input indicated that it was only 'fairly adequate', compared to all the other services which were perceived to be 'adequate' (Table 17). Other recommendations were regular training of farmers, regular monitoring and evaluation and more group discussion. Each recommendation was made by 49.5 percent, 42.4 percent and 41.5 percent respectively. Less than 40 percent of the farmers recommended that service providers should demonstrate new practices and offer more technical advice as means of improving the working relationship.

Table 66: Farmers' recommendations for improving their working relationship with service providers

Recommended improvement	Percent
Increased financial assistance	61.3
Frequent visits	58.2
Timely supply of inputs	56.7
Regular training	49.5
Regular M&E	42.4
More group discussion	41.5
Demonstration of new practices	35.3
More technical advice	32.8

n = 323

Source: Survey Data, 2007

Table 67 shows the managers recommendations for improving their working relationship with clients. The major recommendations were frequent visits (100%), regular training (100%) more group discussion (80%) and increased financial assistance (60%). Of these, only frequent visits and increased financial assistance were mentioned among the top four recommendations by the farmers. Frequent visits may increase the knowledge and understanding that NGOs and their clients have of each other and this could strengthen the relationship.

Table 67: Managers' recommendations for improving their working relationship with clients

Recommendations	%
Frequent visits	100
Regular training	100
More group discussion	80
Increased financial assistance	60
Regular M & E	40
Demonstration of new practices	40
More technical advice	20
Timely supply of inputs	20

n = 5

Source: Survey Data, 2007.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

General Overview

This chapter presents the summary, conclusions and recommendations of the study. It also presents suggested areas for further studies.

Summary

Agriculture is the mainstay of the economy of Ghana, accounting for 39.3% of the Gross Domestic Product (IEA, 2007). The bulk of Ghana's agricultural production comes from subsistence farmers. These farmers have over the years depended on the government for the provision of extension services. Many of them could not be reached by extension agents due to financial and manpower constraints.

NGO interventions in agriculture, especially extension services are useful to complement the efforts of government. Limited studies have been carried out to examine farmers' perceived effects of NGO interventions on agriculture. The study, therefore, attempted to examine farmers' perceptions of NGO interventions on agriculture in the Mfantsiman and KEEA municipalities of the Central Region.

The study utilized a descriptive correlation survey to interview 323 farmers, who were involved with the NGOs programmes in the Mfantsiman and KEEA Municipalities of the Central Region. Measures of central tendency

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and dispersion, frequencies and percentage distributions, dependent and independent t-tests and Pearson product-moment correlation coefficients were the statistical tools used to analyse the data. A summary of the major findings as they relate to the specific objectives of the study was as follows:

Agricultural NGOs in Mfantsiman and KEEA municipalities

Four NGOs, namely ADRA, CEWEFIA, WVI and ASAWA, were identified to be providing agricultural extension services to farmers in the two municipalities. ADRA and CEWEFIA were engaged in agricultural extension activities in the KEEA Municipality while ADRA, WVI and ASAWA were doing a similar work in the Mfantsiman Municipality.

Demographic and farm-related characteristics of farmers

The study showed that the majority of the farmers were at least 40 years old (64.1%), did not hold any leadership position in the community (67.5%) and were literate (60.7%). About 61 percent of the farmers had at least 10 years farming experience indicating that most of the farmers were quite experienced in farming. Most of the farmers (75.5%) were engaged in crop production and cultivated 2 – 5 ha (57.1%). The scale of animal production was generally low.

Mode of operation of NGOs

Selection and involvement of clients

The study revealed that most of the farmers became involved with the NGOs programme through friends (32.5%) and MOFA (29.1%). All the managers of the NGOs indicated that they depended on personal contact, contact with chiefs and MOFA for the selection of clients. The most important factor considered by the NGOs in the selection of their clients was expressed need.

Adequacy and relevance of NGO support services

With respect to the adequacy of services provided by the NGOs, about 6 percent to 34 percent of the farmers perceived the services to be at least 'very adequate'. The respondents perceived agricultural information, input supply, training and technology transfer to be 'adequate' (means ranging from 2.91 to 3.26) and 'very relevant' (means ranging from 3.63 to 4.02) while credit (cash) was perceived to be 'fairly adequate' (mean = 2.34, s.d. = 0.88) and 'relevant' (mean = 2.88, s.d. 0.87). Respondents perceived the services as a 'whole' to be 'adequate' (mean = 2.91, s.d. = 0.88) and 'very relevant' (mean = 3.67, s.d. = 0.80).

Credit

The majority (98.4%) of the farmers received credit from the NGOs. Credit was provided mainly in kind. Respondents accessed the credit facility directly from the NGOs (93.9%) and through the bank (6.1%).

Most (83%) of the farmers indicated that credit provision was timely. The results revealed that the farmers used the credit mainly for purchasing of

inputs such as seeds and fertilisers (44.1%) and for planting (40.7%). With regard to loan repayment, most (85.9%) of the respondents did not have any problems.

Input supply

A sizeable proportion of the farmers, ranging from 47.8 percent to 90.4 percent, rated eight out of nine crop inputs as 'not available'. Overall, the inputs for crop production were perceived by the farmers to be 'barely available' (mean = 1.78, s.d. = 0.73).

The results of input availability for fish processing revealed that almost all the farmers (ranging from 90.5% to 95.5%) rated six out of eight inputs as 'not available'. Generally, inputs for fish processing were rated by farmers as 'not available' (mean = 1.17, s.d. = 0.48).

Four crop inputs namely other agro-chemicals, processing plants, tillage equipment and fertilisers/manures were perceived to be 'expensive' (means ranging from 3.59 to 3.98). Generally, respondents perceived the cost of crop production inputs to be 'moderately expensive' while inputs for fish processing were perceived to be 'expensive' (mean = 3.69, s.d. = 0.39).

Training

Almost half (48.6%) of the farmers preferred the group discussion method. The lecture method (2.5%) was rated as the least preferred method. About 64 percent of the farmers indicated that the NGOs held meetings with them twice a month.

Technology transfer and adoption

The results of the study showed that the respondents were aware of 11 out of 26 technologies. Five of these technologies were in crop production, four in animal production and two in fish processing. A range of 83.3 percent to 95.9 percent of farmers indicated awareness of line/row planting, improved trays, improved varieties, timely weeding, correct spacing, Chorkor Smoker, and suitable housing.

The means (ranging from 3.53 to 3.57) showed that the farmers 'often used' improved varieties, line/row planting, and correct spacing while the farmers 'sometimes used' timely weeding (mean = 3.43, s.d. = 1.27). An overall mean perception of 2.79 with a standard deviation of 0.84 indicated that farmers 'sometimes used' the technology.

With respect to technologies for fish processing, the majority of the respondents 'always used' the Chorkor Smoker (71.4%), improved trays (64.7%) and grading (94.1%). Overall, the respondents 'often use' the technologies.

Agricultural information support

The results revealed that radio (70.6%) was the most popular source of agricultural information for the farmers, besides NGOs. Wholesalers (2.2%) were least mentioned as sources of agricultural information.

Monitoring and evaluation

The study indicated that a sizeable percentage of the farmers rated nine monitoring and evaluation activities as 'average', seven as 'high' and two as

'very high'. More than half of the farmers rated the various aspects of credit (timeliness, use and recovery) and processing of produce as 'average'

Furthermore, the study indicated that the farmers perceived the extent of monitoring and evaluation to be 'high' for correct spacing (mean = 4.08, s.d. = 0.91), early planting (mean = 3.90, s.d. = 1.04), clients get information regularly (mean = 3.78 s.d. = 1.06), timely weed control (mean = 3.75, s.d. = 0.96) and good land preparation (mean = 3.74, s.d. = 0.94). Generally, the respondents perceived the extent of monitoring and evaluation by the NGOs to be 'average' (mean = 3.26, s.d. = 0.69).

Level of farmers' performance before and after NGO interventions

Overall, the mean score before the intervention was 'fair' (mean = 2.03, s.d. = 0.75) while after the intervention it was perceived to be 'good' (mean = 3.2 s.d. = 0.72). Paired sample t-test conducted showed that there was statistically significant (0.000 and 0.013) difference before and after the intervention in respect of the yield, income, quality of produce, food security, weed control, use of fertilizer/manure, land preparation, housing of animals, disease and pest control, storage and preservation, processing and marketing. The trend showed a significant improvement in the agriculture of the respondents after the intervention.

Perceived effect of the intervention on the livelihoods of the farmers

The results of the study revealed that the intervention improved all the five aspects of farmers' livelihood namely ability to pay school fees (95.0%), ability to pay for family's health needs (88.1%), ability to provide good

clothing (82.9%), ability to provide family with more food (75.4%) and ability to provide decent house (54.6%).

Relationship between farmers' perceived effects of NGO interventions and some variables of the study

Pearson product-moment correlation co-efficients (r) showed that there was negative and low significant relationship between farmers' perceived effects of NGO interventions and farming experience (r = -0.262), and size of crop production enterprise (r = -0.163) at the 0.01 alpha level. However, the relationship between the perceived effects of NGO intervention and social status (r = 0.249), and adequacy of training (r = 0.137) was positive, low and significant. The relationships between perceived effects of NGO interventions and the rest of the variables namely sex, age, education, type of enterprise, adequacy of credit, input, technology transfer and agricultural information support were not significant.

Differences in farmers perceived effects of NGO interventions in Mfantsiman and KEEA municipalities

The results of the study showed that respondents in both municipalities rated their performance before the intervention as 'fair'. After the intervention, however respondents in Mfantsiman Municipality perceived the effects of the intervention to be 'good' (mean = 2.94, s.d. = 0.657) while those in KEEA perceived the effects of the intervention to be 'very good' (mean = 3.68, s.d. = 0.551).

An independent sample t – test showed that there were statistically significant differences between the two municipalities in respect of their

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perceptions of the yield (p value, 0.000), quality of produce (p value, 0.000). weed control (p value, 0.000), use of fertilizer/manure (p value, 0.000), land preparation (p value, 0.000), disease and pest control (p value, 0.000), storage and preservation (p value, 0.000) and marketing (p value, 0.000).

Comparison of male and female farmers' perceived effects of NGO interventions

Generally, both male and female farmers perceived the effects of the intervention to be 'good'. An independent sample t – test showed that there were no statistically significant differences (sig 0.068) between the male and female farmers' perceptions about the effects of the intervention at 0.05 alpha level.

Working relationship

The results revealed that 53 percent of the respondents perceived the working relationship with their service providers to be at least 'very good'. The respondents generally perceived the working relationship with the service providers to be 'very good' (mean 3.62, s.d. = 1.003).

The study further showed that the main factor that contributed to a good working relationship with the service providers was friendliness (78%). The majority of farmers, ranging from 95.8 percent to 100 percent, perceived all the ten factors to be constraints to a good working relationship with the NGOs (Table 64). A majority of the farmers recommended increased financial assistance (61.3%), frequent visits (58.2%) and timely supply of inputs (56.7%) for improving their working relationship with the NGOs. The managers, however, recommended frequent visits (100%), regular training

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(100%), more group discussion (80%) and increased financial assistance (60%) for improving their working relationship with clients.

Conclusions

1. Most of the farmers were at least 40years old, literate, had at least 10years of farming experience, engaged in crop production, and cultivated 2 – 5 ha of land.

2. Generally, the farmers perceived four services provided by the NGOs, namely agricultural information support, input supply, training and technology transfer to be 'adequate' and 'very relevant' therefore meeting their expectations. However, the farmers perceived credit to be 'fairly adequate' and 'relevant' implying that the level of credit was not as high as they anticipated. The farmers were of the opinion that the services, on the whole, were 'adequate' and 'very relevant' and there was high degree of consistency in their views. Overall, the farmers perceived the extent of monitoring and evaluation to be 'average' implying that it was not as high as they anticipated.

3. Before the intervention, the farmers perceived the level of their performance to be 'fair'. After the intervention, it was perceived to be 'good'. As a result of the intervention, there was significant improvement in the performance of the farmers in terms of yield, income, quality of produce, food security, weed control, use of fertilizer/manure, land preparation, housing of animals, disease and pest control, storage and preservation, processing and marketing. This implied that the programme was effective.

4. Generally, the intervention improved all the five aspects of the livelihood of the farmers namely the ability to pay school fees, ability to pay for family's health needs, ability to provide good clothing, ability to provide the family

with more food and ability to provide decent house. A range of 54.6 percent to 95.0 percent of the farmers claimed that the intervention improved their livelihood. The farmers who contributed much to the improved livelihood had the following characteristics: they had attained JSS/Middle school education, were between 40 and 49years old, from Mfantsiman Municipality and they were females.

5. There were negative and low significant relationships between farmers' perceived effects of NGO interventions and farming experience as well as size of crop enterprise. The implication is that, smaller farmers who perceive NGO intervention most positively should be targeted. However, the relationship between farmers' perceived effects of the intervention and social status was positive and low, implying that farmers with high social status who perceive the intervention most positively should be targeted. Also, adequacy of training had a significant positive and low correlation with perceived effect of NGO intervention. Adequate training is therefore important in improving the perceived effects of the intervention.

6. The intervention improved the agricultural activities from 'fair' to 'good' in Mfantsiman Municipality and 'very good' in KEEA Municipality. The perceived effect of the intervention was better in KEEA Municipality than in Mfantsiman Municipality, implying that the intervention was more effective in KEEA Municipality than in Mfantsiman Municipality and it met the expectations of farmers in KEEA Municipality. There were statistically significant differences between the two municipalities in respect of yield, quality of produce, weed control, use of fertilizer/manure, land preparation, disease and pest control, storage and preservation and marketing. There were

also significant (0.000) differences between the perceptions of farmers in the Mfantsiman Municipality and KEEA Municipality about the effects of the intervention at 0.05 alpha level.

7. Both male and female farmers perceived the effects of the NGO intervention to be 'good', implying that the programme was not gender biased. Though the male respondents viewed the programme to have a slightly higher effect on their performance, the difference was not significant.

8. The farmers perceived the working relationship with service providers to be 'very good', therefore, meeting their expectations. The majority (78%) of respondents viewed friendliness as the most important contributory factor to a good working relationship with service providers. The major constraints to a good working relationship with service providers were rejection of clients' views, coercion by service providers, complaining, lack of respect, argument, mistrust, backbiting and prejudice. Recommendations made by farmers for improving the working relationship with service providers were increased financial assistance (61.3%), frequent/regular visits by service providers (58.2%), timely supply of inputs (56.7%) and regular training by service providers (49.5%). However, project managers recommended frequent visits (100%), regular training (100%), more group discussion (80%) and increased financial assistance (60%) for improving their working relationship with clients.

Recommendations

Based on the conclusions of the study, the following recommendations were made to improve the NGO interventions on agriculture in the study area.

Demographic and farm-related characteristics of farmers

1. The results of the study have shown that animal production has not been given the needed attention in the study area. There is therefore the need for MoFA and NGOs to organize farmer education and campaign on animal production. The NGOs should also support more farmers in animal production so as to provide sufficient and cheap animal protein to improve the diet of the citizens.

2. Client targeting by NGOs and MoFA should be directed towards smaller farmers since they have a more positive perception on effectiveness of NGO intervention.

Mode of operation of NGOs

1. Financial institutions and NGOs should consider increasing credit support in the form of cash to enable farmers purchase the required inputs and also carry out various cultural practices in anticipation of better returns.

2. NGOs should also consider making all the inputs for production readily available to farmers either by supplying these directly to farmers as part of the credit package or by advising input agencies of the actual supply situation in the field and anticipated demand and thereby co-ordinating supply with the needs of farmers.

3. Inputs like other agro-chemicals, processing plants, tillage equipment, fertilizers/manures, water containers oven, trays, fuel wood which are

perceived to be expensive have the potential of reducing the profitability of the farm business. The NGOs should acquire and hire out some of the expensive inputs to farmers at a moderate rate and fees obtained used in maintaining the input.

4. NGOs should emphasise the use of group discussion method for training clients in order to help them to be interested in learning and also enhance understanding.

5. NGOs should develop strategies that will ensure that farmers are aware of, adopt and continue to use technologies instead of the prevalent situation where they sometimes use or initially use the technologies and then stop. For instance, MoFA and NGOs should set up information kiosks in the rural communities and also provide appropriate extension publications to literate farmers to become aware of agricultural technologies.

6. The service providers should consider making use of the radio to disseminate agricultural information in order to reach a wider coverage. The NGOs can make radio broadcasts more effective by organising farmers into listening clubs and groups for an in-depth discussion.

7. NGOs should recruit and train people in the communities to assist in monitoring and evaluation. This will ensure effective monitoring and evaluation of all the activities carried out by the farmers.

Since field supervision has a 'positive' influence on monitoring and evaluation, NGOs should intensify it. They should also constantly update the analytical skills of staff.

Working relationship

1. NGOs should place emphasis on friendliness as the most important factor that will ensure a good working relationship with clients. They should therefore not just rush into the communities with their programmes but endeavour to win the friendship and confidence of their clients.

2. NGOs, MoFA and other interventionists who would want to improve their working relationship with farmers should increase financial assistance to them, visit them regularly, supply inputs on time and give regular training.

Perceived effect of the intervention on agriculture and livelihood

1. MOFA, other NGOs and financial institutions should also consider financing similar interventions in agriculture in other communities. This is because the programme significantly improved the performance and livelihood of the farmers.

Suggested areas for further study

1. The study should be extended to other municipalities and regions that have high potential for agricultural production.

2. The study should be repeated in the Mfantsiman and KEEA municipalities after some time to show the trend of the effects of the interventions on agriculture.

3. The use of Information and Communications Technology (ICT) e.g. mobile phones, radio in extension delivery should be studied

REFERENCES

Ablordeppey, S. D. (2003, December 15). Information on access to credit not available. *Daily Graphic*, p.29

Akinola, A. A. (1986). Farmers' participation in the national accelerated food production project (NFPP) in Nigeria. *Agricultural Systems*, 20 (1985). pp301 – 311.

Akinsanmi, O. (1999). *Senior secondary agricultural science* (2nd ed.). Essex: Longman Group Limited.

Akinyosoye, V. O. (1984). *Senior tropical agriculture*. London and Basingstoke: Macmillan Publishers.

Albert H., Braun M., Donkoh F., Loss H. & Schill P. (1999). Analysis of agricultural extension concepts in Ghana. Framework for participatory extension, GTZ Workshop 20-21, May, 1999.

Alhassan, Z. (2006, May 4). *Daily Graphic*. Graphic Communications Group Ltd., Accra, Ghana. p.48.

Amedahe, F. K. (2004). Research methods notes for teaching. Unpublished manuscript, University of Cape Coast, Cape Coast.

Anderson, J. R & Herdt, W. R. (1989). Impact of new technology on foodgrain productivity. In A. Maunder & A. Valdes (Eds.), *Agriculture and Governments in Interdependent World*. University of Oxford: International Association of Economists.

Andrews, R. T. (2003). *Farmer groups and adoption of public extension. innovations in the Greater Accra Region of Ghana*. Unpublished M.Phil Thesis, Department of Agricultural Economics and Extension, University of Cape Coast , Cape Coast, Ghana.

Asante-Mensah, S. (1988). *The adoption of recommended practices by cocoa farmers: The Ghana cocoa rehabilitation program*. Unpublished M.Phil Thesis, The University of West Indies, Department of Agricultural Extension, Faculty of Agriculture, St. Augustine.

Ayers, A. J. (1992). Conflicts or Complementarities? The State and NGOs in the Colonisation Zones of San Julian and Berlin, Eastern Bolivia. *Agricultural Research and Extension Network* Paper No.37. London: Overseas Development Institute.

Ba, M. (1995). The experience and limitations of NGOs in West Africa. *The Courier*, No. 152, 69-70

Baffour, F. I. H. (1981). *'O' level agricultural science*. Accra: Afram Publications (Ghana) Ltd.

Bebbington, A. (1997). New states, new NGOs? Crises and transitions among rural development NGOs in the Andean Region. *World Development*, 25(11), 1755 – 1765.

Benor, D. & Harrison, J. Q. (1977). *Agricultural extension: The training and visit system*. Washington DC: World Bank.

Benor, D. & Baxter, M. (1984). *Training and Visit Extension*. Washington DC. World Bank.

Best, J. W & Khan, J. V (1998). *Research in education*. (8th ed.). Needham Heights, MA, USA: Allyn and Bacon.

Blakemore, K. & Cooksey, B. (1980). *A sociology of education for Africa,* London: George Allen and Unwin.

Brandâo, A. S. P. & Carvallo, J. L. (1991). The Political Economy of Agricultural Pricing Policy. *Trade, Exchange Rate, and Agricultural Pricing Policies in Brazil.* Volume 1, The Country Study. The World Bank, Washington D.C. pp132,133

Brodhead, T. (1987). NGOs: In one year, out the other? *World Development,* 15,1 – 6.

Buadi, D. K. (1992). Diffusion and adoption of the Chorkor Smoker in Tema U compound. Unpublished M.Phil Thesis, Department of Agricultural Extension, University of Ghana, Legon.

Bureau of Labour Statistics, U. S Edition Department of Labour, Career Guide to Industries, 2002-2003, Agricultural Production. Retrieved on February 05, 2004 from the Internet at *http://www.bls.gov/oco/cg/cgs001.htm.*

Buvinic, M. & Mehra, R. (1990). Women and agricultural development. In C. Eicher & J. M. Staatz (Eds.), *Agricultural Development in the Third World.* Baltimore: The John Hopkins University Press.

Byrnes, F.C. & Byrnes K. J. (1978). Agriculture extension and education in developing countries. In R. Weiz (Ed.), *Rural Development in a Changing World.* (pp. 20 – 25), Mass, Cambridge: MIT Press.

Byrnes, J. H. (1978). *Literature Review of Research Methodology on the Diffusion and Adoption of Innovations in Fertiliser-Related Agricultural Production Technology in the Developing Countries.* Alabama: IFDC.

Calhoun, C., Light, D. & Keller, S. (1994). *Sociology* (7th ed.). New York: McGraw-Hill.

Carney, D. (1998). *Changing Public and Private Roles in Agricultural Service Provision*. Overseas Development Institute, London: Portland House Stag Place.

Carr, M. (1981). Technologies Appropriate for Women: Theory, Practice and Policy. In R. Dauber & M. L Cain (Eds.),*Women and Technological Change in Developing Countries. AAAS Selected Symposium* 53 (p.193). Boulder, Colorado: West View Press Inc.

Cernea, M. M. & Tepping, B. J. (1977). *A System for Monitoring and Evaluating Agricultural Extension Projects*. World Bank Staff Working Paper No.272. Washington DC.: The World Bank.

Chaguma, A. & Gumbo, D. (1993). ENDA – Zimbabwe and community research. In K. Wellard,& J. Copestake (Eds.), *NGOs and the state in Africa: Rethinking roles in sustainable agricultural development* (pp.99 – 108). London: Routledge.

Chandri, D. P. (1968). *Education and agricultural productivity in India*, Ph.D dissertation, University of Delhi.

CIMMYT (1993). *The adoption of agricultural technology: A guide for Survey Design*. CIMMYT Economic Program. Mexico, D. F: CIMMYT.

Cohen, M. & Sebstad, J. (1999). *Finance impact micro evaluation: Going Down Market*. Paper Prepared For Conference On Evaluation And Poverty Reduction. World Bank.

Colecraft, E. (1993). Traditional Food Preservation: An Overview. *African Technology Forum*. 6 (1), 15,16.

Coste, R. (1993). *Coffee: The plant and the product*. London and Basingstoke: The Macmillan Press Ltd.

Dankwa, J. B. (2002). *Factors affecting adoption levels of cocoa technologies in the Ashanti Region of Ghana:* Unpublished M.Phil Thesis, Department of Agricultural Economics and Extension, University of Cape Coast, Cape Coast, Ghana.

Dankwa, J. B. (2004). *Farmers and extension staff perceptions of factors affecting the effectiveness of agricultural extension delivery in the Ashanti Region of Ghana*. Unpublished Doctoral thesis. Department of Agricultural Economics and Extension, University of Cape Coast, Cape Coast, Ghana.

Davis, J. A. (1971). *Elementary survey analysis*. Englewood, NJ: Prentice - Hall

Deboeck, G. & Ng, R. (1980). *Monitoring rural development in East Asia*, World Bank staff working paper No.439. Washington DC: The World Bank.

De Crombrugghe, G. (1995). Institutional support for NGOs in the south. *The Courier*. 152, 71 – 72.

De Jong, J. (1991). Non-Governmental Organisations and health delivery in Sub-Saharan Africa. *The World Bank Paper*. Washington DC: World Bank.

Dupriez, H. & De Leener, P. (1989). *African gardens and orchards*. London and Basingstoke: Macmilan Publishers.

Eday, H. (1980). *Women at the centre, Grameen Bank borrowers after one decade.* Oxford: West View Press.

El-Akhrass, H. (1987). Syria and the CGIAR centres. A study of their collaboration in agricultural research study, *CGIAR Study Paper No.13.* Washington, DC: The World Bank.

Elliot, C. (1987). Some aspects of relations between the north and south in the NGO sector. *World Development, 15,* 57 – 58.

Fakorede, M. A. B. (1982). *A school certificate/GCE 'O' level revision course: Agricultural science* (P.S.Samuel, Ed.), Ibadan: Macmillan Nigeria Publishers Ltd.

FAO (1994). *Agricultural credit in African report on the FAO / Finland regional seminar on agricultural credit in Africa,* Rome: FAO.

Farrington, J. (1994). Public sector agriculture extension: Is there life after structural adjustment? O.D.I. No.2.

Farrington, J. (1997). The Role of Non-Governmental Organisations in extension. In B. Swanson, R. Bentz, & A. Sofranko (Eds.), *Improving Agricultural Extension: A Reference Manual* (93 – 104). Rome: FAO.

Feder, G & Slade, R. H (1984). Aspects of the training and visit system of agricultural extension in India. *World Bank Staff Working Paper No. 656.* Washington DC: The World Bank.

Feder, G., Just, R. E. & Zilberman, D. (1985). Adoption of agricultural innovations in developing countries. *Economic development and cultural change. 22(2),* 255 – 259.

Feldman, R. S. (1990). *Understanding Psychology* (2nd ed.). New York: McGraw-Hill Publishing Company.

Fliegel, F. C. (1989). *Extension Communication and the Adoption Process:* Agricultural Extension. Reference Manual, Rome: FAO.

Fox, T. H. (1987). NGOs from the United States. *World Development,* 15, 11 – 19.

Frantz, T. R. (1987). The role of NGOs in the strengthening of civil society. *World Development.* 15, 1121 – 1127.

Franzio, S. L (1996). *Psychology.* (2nd ed.). London: Longman.

Gamble, T. K. & Gamble, M. (2002). *Communication works.* (7th ed.). New York: McGraw-Hill/Irwin Inc.

Garforth, C. (1982). Reaching the rural poor: A review of extension strategies and methods. In E. Jones and M. Rolls (Eds.), *Progress in Rural Extension and Community Development.*(p.54). John Wiley and Sons Ltd.

Garforth, C. (1997). Supporting sustainable agriculture through extension in Asia. ODI. No.21

Garilao, E. D. (1987). Indigenous NGOs as strategic institutions: Managing the relationship with government and resource agencies. *World Development,* 15, 113-120

Gay, L. R. (1987). *Educational research: Competencies for analysis and application.* London: Merril Publishing Company.

Ghanaian Times (2004, May 26). *Technoserve, boosts rice, shea production in Brong Ahafo Region.* p.11

Ghana Statistical Service (2000). *2000 Population and housing census: Provisional results,* Accra: Ghana Statistical Service.

Gibbs, C., Fumo, C. & Kuby, T (1999). *Non-Governmental Organisations in World Bank—Supported projects: A review.* Washington, DC: The World Bank.

Gibson, J. J. (1969). *The Ecological approach to visual perception,* Boston: Houghton Mifflin.

Godenker, L. and Weiss, T. G. (1995). Pluralising global governance: Analytical approaches and dimensions. *Third World Quarterly,* 16(3), 358-387

Gomez, A. A. (1986). Philippines and the CGIAR centres. A study of their collaboration in agricultural research. *CGIAR study paper* No.15. Washington DC: The World Bank.

Griliches, Z. (1964). Research expenditures, education and the aggregate: Agricultural production functions. *Agricultural Economics.* Res. 54, 961 – 974.

Habitat (1993). *National trends in housing-production practices.* Vol. 4. Nairobi: HFHI.

Halim, A. & Ali, M. (1997). Training and professional development. In B.E Swanson, R. P. Bentz & A. J. Sofranko (Eds.), *Improving agicultural extension: A reference manual* (pp. 135 – 140). Rome: FAO.

Hayes, N. and Orell, S. (1992): *Psychology: An introduction* (1st ed.). New York: Longman Inc.

Hoeper, B. (1983). Selected results of the development officers and village extension workers survey in Jind, Karnal and Manhendragarh districts, Haryana, India. Institute of socio-economics of agricultural development (Berlin), Organisational and methodological variables of the training and visit system of extension, Working and discussion note No.1 (Mimeo).

House, E. R. (1980). *Evaluating with validity*. Beverly Hills, CA: Sage.

Howell, J. (1982). *Managing agricultural extension: The T & V system in practice*. Agricultural Administration Network Discussion Paper No.8. London: Overseas Development Institute.

Hurley, D. (1990) *Income generation schemes for the urban poor*. Development guidelines. No. 4, Oxford: OXFARM.

IFAD (2000). *IFAD and NGOs dynamic partnerships to fight rural poverty*, Rome: IFAD.

Iheduru, N. G. (2002). Women entrepreneurship and development. *The gendering of micro-finance in Nigeria*. Presented at 8th interdisciplinary congress on women, Mackerere University, Kampala, Uganda.

IITA (1989). Cowpea research at IITA. CLIP Research Monograph I. Ibadan: International Institute of Tropical Agriculture.

IITA (1990). *Cassava in Tropical Africa: A reference manual*. Ibadan: International Institute of Tropical Agriculture.

Institute of Economic Affairs (2007). *Annual 2006 economic review and outlook*, Accra: IEA.

Israel, G. D. (1992). *Sampling: The evidence from extension program impact.* Gainsville. FL: University of Florida.

Johnson, D. T. (1983*). The business of farming: A guide to farm management in the tropics.* London and Basingstoke: Macmillan Publishers Ltd.

Kagya-Agyemang, C. (2001). *The impact of agricultural extension on small-scale cassava farmers in the Adansi East District of Ashanti Region, Ghana.* Unpublished M.Phil Thesis, Department of Agricultural Economics and Extension, University of Cape Coast, Cape Coast, Ghana.

Kekeocha, C. C. (1984). *Poultry production handbook.* London and Basingstoke: Macmillan Publishers Ltd.

Kerlinger, F. N. (1979). *Behavioural research: A conceptual approach.* New York: Holt, Rinehart and Winston.

Knowles, M. N. (1980). *The modern practice of adult education from pedagogy to andragogy.* Chicago: Follet Publishing Company.

Kohls, R. L. and Uhl, J. N. (1986). *Marketing of agricultural produce.* New York: Macmillan Publishing Company Ltd.

Komolafe, M. F. and Joy, D.C. (1981). *Practical agricultural science for West African schools and colleges.* Ibadan: University Press Limited.

Koney, E. B. M. (1992). *Livestock production and health in Ghana.* Accra: Advent Press.

Korten, D. C. (1987). Third generation NGO strategies. A key to people-centred development. *World Development,* 15, 145 – 159.

Kumi, J. A. (2003). *Factors affecting attitudes of cocoa farmers towards replanting of cocoa in the kwaebibirem district of the Eastern Region, Ghana.* Unpublished Doctoral Thesis, Department of Agricultural Economics and Extension. University of Cape Coast, Cape Coast, Ghana.

Kwarteng, J. A. (1995). *Development of training materials in agriculture.* UK: Sayce Publishing.

Kwarteng, J. A & Towler, M. J. (1994). *West African agriculture. A textbook for schools and colleges.* London and Basingstoke: The Macmillan Press Ltd.

Kyeremanten, A. (2005, February 10). Develop effective packaging concepts. *Daily Graphic,* p.33.

La-Anyane, S. (1985). *Economics of agricultural development in tropical Africa,* London: John Wiley and Sons Inc.

Landim, L. (1987). Non-Governmental Organisations in Latin America. *World Development,* 15, 29 – 38.

Lewis, M. & Kenny, G. (1988). The private sector and family planning in developing countries. *The World Bank Working Paper.* Washington DC: World Bank.

Lieberman, M. (1983) *Post-harvest psychology and crop preservation.* London: Plenum Publishing Corporation.

Lowe, P. (2004). *Strategies for developing productive relationships.* Retrieved July 2, 2007, from http:// www.familydynamics.net

Malena, C. (1993). Relations between northern and southern non-governmental development organisations. Paper Presented at a Conference of the Canadian Association of African Studies, University of Toronto (Toronto: May 12 – 15, 1993).

Marshall, C. K. A. (2004). *Farmers' perception on the effectiveness of agricultural extension services provided by Ministry of Food and agriculture (MoFA) and NGOs in the Central Region of Ghana.* Unpublished Doctoral Thesis, Department of Agricultural Economics and Extension. University of Cape Coast, Cape Coast, Ghana.

McCarthy, J. & Perreauult, W. D. (1993). *Basic marketing* (11th ed.). Boston: Irwin Inc.

Micah, J. A., Anokye, N. A. & Britwum, A. O. (2000). *The marketing of vegetables in Central Region of Ghana: The case of tomatoes and garden eggs.* Research report series paper No.27. Cape Coast: Centre for Development Studies.

MoFA (2002). *Agriculture in Ghana, facts and figures.* Statistics, Research and Information Directorate (SRID), Ministry of Food and Agriculture, Accra: SRID, MoFA

MoFA (2003). *Agricultural extension policy (Revised).* Accra: Directorate of Agricultural Extension Services, MoFA.

MoFA (2004). Annual sample survey of agriculture. Ghana 2003. Regional and district cropped area, Yield and production statistics unit, Accra: MoFA

Moore, M. (1983). Institutional Development, The World Bank, and India's New Agricultural Extension Programme, Institute of Development Studies (Brighton), (Mimeo).

Musgrove, P. (1996). Public and private roles in health: Theory and financing patterns. *World Bank Discussion Paper* 339. Washington DC.

Musgrove, P. (2004). *Health economics in development 2004.* Washington, DC: The World Bank.

Nabare, D. (2007). *The perceived impact of the LACOSREP micro credit scheme on women farmers' livelihoods in the Upper East Region of Ghana.* Unpublished M.Phil Thesis, Department of Agricultural Economics and Extension, University of Cape Coast, Cape Coast, Ghana.

Ndi, E. E. (1993). Food processing: A vital link in African Agro-Industrial development? *African technology forum,* 6 (1), 20.

Olawoye, J. E. (1993). Gender priorities and issues in agricultural extension delivery. Invited paper presented at the national conference of the society for agricultural extension of Nigeria. 24th – 26th February, 1993.

Olorunnipa, Z. I. (1993). African women and agricultural technologies. *African technology forum.* 6 (1), 25-26.

Orhin, I. K. (2003). *Stakeholders' perception of public and private extension provision to cashew farmers in the Central Region of Ghana.* Unpublished M.Phil Thesis, Department of Agricultural Economics and Extension, University of Cape Coast, Cape Coast, Ghana.

Owusu-Sekyere, B. (1997, February 8). Farmers lack ready market for their produce. *Daily Graphic*, p.9.

Phillips. R. D. & McWatters, R. H. (1991). Contribution of cowpeas to nutrition and health. *Food Technol.* 45(9), 25.

Posner, M. I. & Presti, D. E. (1987). Selective attention and cognitive control. *Trends in Neuroscience.* 10, 13-17

Poulton, C., Doward, A. & Kydd, J. (1997). Interlocking transactions: Market alternatives for RNR services. *Final Report to the Department for International Development.* Asford, Whye College.

Preker, A. S. & Harding, A. (2003). *Innovations in health service delivery. The corporatization of public hospitals.* Washington DC: The World Bank.

Pretty, L.N., Guilt, I., Thompson, J. & Scoones, I. (1995). *Participatory learning and action: A Trainer's Guide.* London: International Institute for Environment and Development (IIED).

Rizika, J. (1993). Non-Governmental Organisations and natural resources management. Ghana: Country Assessment. Washington DC.

Rogers, E. M. (1961). Characteristics of agricultural innovations and other adopter categories. Wooster, Ohio: Agricultural Equipment Research Station Bulletin 882.

Rogers, E. M. (1983). *Diffusion of innovation* (3rd ed.). New York: The Free Press. Macmillan Publishing Co. Inc.

Rogers, E. M. & Shoemaker, F. F. (1971). *Communication of innovations.* New York: Collier Macmillan.

Ruttan, V. W. (1991). Constraints on sustainable growth in agricultural production: Into the 21st Century. *Agricultural Issues in the 1990s. Proceedings of the Eleventh Agriculture Sector Symposium.* Washinton DC: The World Bank.

Sen, B. (1987). NGO self-evaluation: Issues of concern. *World Development,* 15, 161 - 167

Silva, L. J. P. (1987). Peru and the CGIAR centres. A study of their collaboration in agricultural research. *CGIAR Study Paper* No. 13, Washington, DC: The World Bank.

Sinnadurai, S. (1992). *Vegetable cultivation.* Accra: Asempa Publishers.

Squire, L. & Demery, L. (1996). Africa: An emerging picture. *The World Bank Research Observer,* 11(1), 39-59.

Srivastava, J. C. (1985). Harnessing technology for improving the quality of life of rural women. In S.C. Jain (Ed.), *Women and Technology.* Jaipur: Ramat Publications.

Srivastava, J. C. (1991). Crop technologies for the 1990s. *Agricultural issues in the 1990s. Proceedings of the Eleventh Agriculture Sector Symposium.* Washington DC: The World Bank.

Stanton, W. J., Etzel, M. J. & Walker, B. J. (1991). *Fundamentals of marketing* (9th ed.). New York: McGraw Hill Inc.

Strow, H. A. (1981). *Homemaking handbook for village workers in many countries.* Washington DC: Peace Corps/ ICE.

Sukaryo, D. G. (1983). Farmer participation in the training and visit system and the role of the village extension worker experience in Indonesia. In M. M. Cernea, J. K. Coulter & J. F. A. Urussel (Eds). *Agricultural Extension by Training and Visit. The Asian Experience.* Washington DC: The World Bank.

Swanson, B. E. & Sammy, M. M (2000). Developing an extension partnership among public, private and Non-Governmental Organisations. *16th Annual Conference Proceedings. Association for International Agriculture & Extension Education.* Raleigh ,North Carolina: North Carolina State University.

Tauer, L. (2000). Old farmers are not productive: They just need new tractor. *America news service.* May 2000

Taylor-Davis, S. & Stone, M. B. (2004). Food Processing and Preservation. Retrieved January 26, 2005, from *http:// www.foodsecurity.tahomafoodsystem.net.*

Tete, J. (1996). *The economics of fish smoking: A case study of Chorkormey.* Barchelor of Science Dissertation, Department of Agricultural Economics and Agribusiness, Faculty of Agriculture, University of Ghana, Legon, Accra, Ghana.

The Courier (1995). *On the diversity and role of NGO.* 152, 66

Twose, N. (1987). European NGOs: Growth or Partnership? *World Development,* 15, 7.

Vakil, A. C. (1997). Confronting the classification problem: Toward a taxonomy of NGOs. *World Development,* 25 (12), 2057 – 2070.

Van den Ban, A. W. (1960). Locality group difference in the adoption of new farm practices. *Rural Sociology,* 25, 308-320.

Van den Ban, A. W. & Hawkins, H. S. (1996). *Agricultural Extension* (2nd ed.). London: Blackwell Science Ltd.

Wagstaff, A. and Claeson, M. (2004). *The millenium development goals for health rising to the challenges.* Washington DC: The World Bank.

Whalen, D. H. & Liberman, A. M. (1987). Speech perception takes precedence over non-speech perception. *Science.* 237, 169 – 171.

William, S. T. K., Finley, J. M. & Williams, C. E. (1984). *A manual for agricultural extension workers in Nigeria.* p.169

Williams, S. K. & Williams, C. E. (1971). Farmers contact with agricultural extension services in western state of Nigeria. *Bulletin of Rural Economics and Sociology.* 6 (1), 169

World Bank (2005). *A Guide to competitive vouchers in health.* Washington DC: The World Bank.

Wortman, C. B., Loftus, E. F, & Marshall, M. E. (1992*). Psychology* (4th ed.). New York: McGraw Hill Inc.

Yaron, I. (1992). *Rural finance in developing countries.* World Bank W.P.S. 875, Washington DC.: World Bank Publication.

Zimbardo, P. G. & Weber, A. L. (1997). *Psychology* (2nd ed.). London: Longman.

APPENDICES

APPENDIX I

DAVIS CONVENTION FOR DESCRIBING MAGNITUDE OF CORRELATION CO-EFFICIENT

	Magnitude of Correlation Co-efficient	Description
1	1.0	Perfect
2	0.7 – 0.99	Very High
3	0.50 – 0.69	Substantial
4	0.30 – 0.49	Moderate
5	0.10 – 0.29	Low
6	0.01 – 0.09	Negligible

Source: Davis (1971)

INTERVIEW SCHEDULE FOR FARMERS

Please read through the following items and provide responses which best describe your situation. All information provided will be treated as confidential. Thanks for your co-operation.

District ....

Village./ community..

Date...

NGO Providing Support:...........................

Name of Farmer: ....

Name of Interviewer:.............................

1. Demographic and farm-related characteristics of farmer

   1.1. Sex   1) Male [ ]   2) Female [ ]

   1.2 Age   1) Below 20 years [ ]   2) 20-29 years [ ]

          3) 30-39 years [ ]   4) 40-49 years [ ]   5) 50-59 years [ ]

          6) More than 59 years [ ]

   1.3 Status/Position   1) Leader [ ]   2) Not in leadership position [ ]

   1.4 Highest level of education attained   1) No formal education [ ]

          2) Primary [ ]   3) J.S.S/Middle [ ]

          4) Secondary/Technical [ ]   5) Tertiary [ ]

   1.5 Farming experience   1) Less than 5 years [ ]   2) 5-9 years [ ]

          3) 10-14 years [ ]   4) 15-19 years [ ]   5) 20-24 [ ]

          6) 25-29 years [ ]   7) 30 and above [ ]

   1.6 Type of enterprise supported by NGO   1) Animal production [ ]

2) Crop production [ ]   3) Animal and crop production [ ]

4) Crop processing [ ]   6) Fish processing [ ]

6) Animal processing [ ]   7) Agro-forestry [ ]

1.7 Animals kept with NGO's support.   1) Cattle [ ]   2) Sheep [ ]

3) Goat [ ]   4) Pigs [ ]   5) Grasscutter [ ]   6) Snail [ ]

7) Bees [ ] 8) Domestic fowls [ ]   9) Ducks [ ]   10) Guinea fowls

11) Rabbit [ ]   12) Fish [ ]   13) Guinea pigs [ ]

1.8 Crops produced with NGO's support.   1) Maize [ ]   2) Citrus [ ]

3) Cashew [ ]   4) Pineapple [ ]   5) Rice [ ]   6) Oil Palm [ ]

7) Plantain [ ]   8) Mangoes [ ]   9) Groundnuts [ ]   10) Soya

bean [ ]   11) Vegetables [ ]   12) Cassia [ ]   13) Cassava [ ]

14) Tiger nut [ ]

1.9 Size of crop production enterprise   1) Less than 2ha [ ]   2) 2-5ha [ ]

3) 6-10ha [ ]   4)11-15ha [ ]

5) 16-20ha [ ]   6) More than 20ha [ ]

1.10 Number of animals kept   1) Less than 5 [ ]   2) 5-9 [ ]

3) 10-14 [ ]   4) 15 – 19 [ ]   5) 20 – 24 [ ]

6) 25-29 [ ]   7) 30 and above [ ]

1.11 Number of beehives kept   1) Less than 5 [ ]   20) 5-9 [ ]

3) 10-14 [ ]   4) 15-19 [ ]   5) 20-24 [ ]   6) 25-29 [ ]

7) 30 and above [ ] .

1.12 Quantity of produce processed per day during the peak season

1) Less than 5 bags/crates [ ]   2) 5 – 9 bags/crates [ ]

3) 10 – 14 bags/crates [ ] 4) 15 – 19 bags/crates [ ]

5) 20 – 24 bags/crates [ ]   6) 25 – 29 bags/crates [ ]

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7) 30 and above bags/ crates [ ]

1.13 Quantity of produce processed per day during the lean season

1) Less than 5 bags/crates [ ]   2) 5 – 9 bags/crates [ ]

3) 10 – 14 bags/crates [ ]   4) 15 – 19 bags/crates [ ]

5) 20 – 24 bags/crates [ ]   6) 25 – 29 bags/crates [ ]

7) 30 and above bags/ crates [ ]

2. Membership

2.1 How did you become involved with the NGO's programme?

....

....

3. Type of Service

3.1 Indicate the type of support service you have received from the NGO.

Tick the one that applies to you.

	Yes	No.
Credit (cash)	[ ]	[ ]
Input	[ ]	[ ]
Training	[ ]	[ ]
Technology transfer	[ ]	[ ]
Agricultural information	[ ]	[ ]

Others (Please state)..

4. Relevance / Adequacy of Service

4.1 For each extension service indicated, kindly choose by circling an option

that best applies to you. Please use the rating scales below.

Adequacy of service: 1) Not adequate   2) Fairly adequate

3).Adequate   4)Very adequate   5) Excellent.

Relevance of service: 1) Not relevant   2) Fairly relevant

3) Relevant 4) Very relevant   5) Excellent

Farmers' perception about the provision of services.

Type of service	Rating of services provided									
	Adequacy of service					Relevance of service				
Credit (cash)	1	2	3	4	5	1	2	3	4	5
Input	1	2	3	4	5	1	2	3	4	5
Training	1	2	3	4	5	1	2	3	4	5
Technology transfer	1	2	3	4	5	1	2	3	4	5
Agricultural Information	1	2	3	4	5	1	2	3	4	5

5. Credit

5.1 Have you received credit from your service provider?

Yes [ ]   No [ ]

5.2 If No, skip to Input Q.1.

5.3 If Yes, in what form was credit provided?

1) Cash [ ]   2) Kind [ ]   3) Cash and Kind [ ]

5.4 How did you access credit?

1) Through the bank [ ]   2) Directly from NGO [ ]

5.5 Give your opinion on the procedure for accessing the credit.

      1) Very easy [ ]   2) Easy [ ]   3) Fairly difficult [ ]

      4) Difficult   [ ]   5) Very difficult [ ]

5.6 Kindly indicate the interest rate on the credit facility given by your

service provider.   1) Very low [ ]   2) Low [ ]   3) Moderate [ ]

      4) high [ ]   5) Very high [ ]

5.7 Indicate the interest rate (%) charged on the credit facility.

      ....

5.8 Was credit provided on time?   Yes [ ]   No [ ]

5.9 Please list the various ways you used the credit.

      ....

      ....

5.10 Do you have problems in repaying the loan?   Yes [ ]   No [ ]

6. Inputs

6.1 Which of the following inputs do you need for your production?

      1) Seeds [ ]   2)Seedlings [ ]   3)Hand tools [ ]   4) Fertilisers/

      manure [ ]   5)Other agro-chemicals [ ]   6)Tillage equipment [ ]

      7)Processing plant [ ]   8) Storage and preservation facilities [ ]

      9) Market facilities [ ]   10) Animals [ ]   11) Animal houses [ ]

      12) Animal feed [ ]   13) Drugs/vaccines [ ]   14) Oven [ ]

      15) Trays [ ]   16) Fuelwood [ ]   17) Water containers [ ]

      18) Baskets / crates [ ]   19) Packaging materials [ ]

      Others (please specify)...

6.2 Please use the rating scale below to indicate your feelings about the availability and cost of inputs supplied to you by the service provider. Circle the option that is appropriate.

Availability of inputs....   1) Not available   2) Barely available

3) Available   4) Readily available

Cost of inputs......   1) Very cheap   2) Cheap

3) Moderately expensive   4) Expensive   5) Very expensive

NA - Not applicable

Inputs	Availability of inputs				Cost of inputs				
Crops									
1. Seeds/planting materials	NA 1	2	3	4	1	2	3	4	5
2. Seedlings	NA 1	2	3	4	1	2	3	4	5
3. Hand tools	NA 1	2	3	4	1	2	3	4	5
4. Fertilisers / Manures	NA 1	2	3	4	1	2	3	4	5
5. Other Agro-chemicals	NA 1	2	3	4	1	2	3	4	5
6. Tillage equipment	NA 1	2	3	4	1	2	3	4	5
7. Processing plants	NA 1	2	3	4	1	2	3	4	5
8. Storage and preservation facilities	NA 1	2	3	4	1	2	3	4	5
9. Market facilities	NA 1	2	3	4	1	2	3	4	5
Livestock / Animals									
1. Animals	NA 1	2	3	4	1	2	3	4	5
2. Housing	NA 1	2	3	4	1	2	3	4	5
3. Animal feed	NA 1	2	3	4	1	2	3	4	5
4. Drugs / vaccines etc.	NA 1	2	3	4	1	2	3	4	5
5. Storage and preservation facilities	NA 1	2	3	4	1	2	3	4	5
6. Market facilities	NA 1	2	3	4	1	2	3	4	5
Fish									
1. Oven	NA 1	2	3	4	1	2	3	4	5
2. Trays	NA 1	2	3	4	1	2	3	4	5
3. Fuelwood	NA 1	2	3	4	1	2	3	4	5
4. Water containers	NA 1	2	3	4	1	2	3	4	5
5. Baskets / crates	NA 1	2	3	4	1	2	3	4	5
6. Packaging materials	NA 1	2	3	4	1	2	3	4	5
7. Storage and preservation facilities	NA 1	2	3	4	1	2	3	4	5
8. Market facilities	NA 1	2	3	4	1	2	3	4	5

6.3 Were inputs provided on time?   Yes [ ]   No [ ]

7. Training

7.1 Indicate the method used by the NGO for your training. Please tick the appropriate response.

	Yes	No
Farm / site visit	[ ]	[ ]
Group Discussion	[ ]	[ ]
Method demonstration	[ ]	[ ]
Result demonstration	[ ]	[ ]
Lecture	[ ]	[ ]

Others (Please specify)..

7.2 What is your most preferred method of training?...........................

7.3 How often did the service providers hold meetings with you?

1) Once a month [ ]   2) Twice a month [ ]   3) Thrice a month [ ]

4) More than four times a month [ ]

5) Others (please specify) ....

8. Technology transfer and use.

8.1 For each technology indicated in the table below, kindly choose the appropriate options under awareness and adoption of the listed technologies.

Note: **NA means Not Applicable**

Awareness   1) Yes, I am aware   2) No, I am not aware

Adoption of technology.   1) I have not adopted the technology

2) I initially used the technology but stopped   3) I sometimes use the technology 4) I often use the technology

5) I always use the technology.

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Technology	Are you aware of the technology			Have you adopted				
				1	2	3	4	5
Crop Production								
Improved varieties	NA	Yes	No	1	2	3	4	5
Line / row planting	NA	Yes	No	1	2	3	4	5
Correct spacing	NA	Yes	No	1	2	3	4	5
Timely weeding	NA	Yes	No	1	2	3	4	5
Chemical pest control	NA	Yes	No	1	2	3	4	5
Chemical disease control								
Organic manure use	NA	Yes	No	1	2	3	4	5
Chemical fertilizer use	NA	Yes	No	1	2	3	4	5
Plough / harrow use	NA	Yes	No	1	2	3	4	5
Crop Processing	NA	Yes	No	1	2	3	4	5
Processing plants								
Crop Marketing	NA	Yes	No	1	2	3	4	5
Market infrastructure								
Grading	NA	Yes	No	1	2	3	4	5
Packaging	NA	Yes	No	1	2	3	4	5
Crop storage and	NA	Yes	No	1	2	3	4	5
preservation								
Chemicals								
Improved maize crib	NA	Yes	No	1	2	3	4	5
Refridgerator / freezer	NA	Yes	No	1	2	3	4	5
	NA	Yes	No	1	2	3	4	5
Livestock								
Improved breed	NA	Yes	No	1	2	3	4	5
Suitable housing	NA	Yes	No	1	2	3	4	5
Balanced ration	NA	Yes	No	1	2	3	4	5
Health	NA	Yes	No	1	2	3	4	5
Market infrastructure	NA	Yes	No	1	2	3	4	5
Grading	NA	Yes	No	1	2	3	4	5
Packaging	NA	Yes	No	1	2	3	4	5
Fish								
Chorkor smoker								
Improved trays	NA	Yes	No	1	2	3	4	5
Market infrastructure	NA	Yes	No	1	2	3	4	5
Grading	NA	Yes	No	1	2	3	4	5
Packaging	NA	Yes	No	1	2	3	4	5
	NA	Yes	No	1	2	3	4	5

9. **Agricultural Information·**

Apart from the NGO, from which other sources do you also receive agricultural information.

1) Radio [　]　　　2) T V [　]　　　3) Farmer friends [　]

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4) Newspapers/print media [ ] 5) Agric science teacher in the locality[ ]

6) Retailers [ ] 7) Wholesalers [ ] 8) Truck drivers [ ]

9) MoFA Extension Agents [ ]

Others (specify)..

10. Monitoring and Evaluation

10.1 Please indicate the extent to which your **service provider** participates in the following Monitoring and Evaluation activities. Circle the appropriate response using the grading scale below.

   1) Very Low   2) low   3) Average   4) High   5) Very high

   NA means Not Applicable

	1	2	3	4	5
1. Ensuring timely credit delivery	NA 1	2	3	4	5
2. Ensuring credit is used for the right purpose	NA 1	2	3	4	5
3. Ensuring credit is recovered from clients	NA 1	2	3	4	5
4. Ensuring that inputs arrive on time	NA 1	2	3	4	5
5. Ensuring inputs supplied to clients are adequate	NA 1	2	3	4	5
6. Ensuring good land preparation	NA 1	2	3	4	5
7. Ensuring early planting	NA 1	2	3	4	5
8. Ensuring correct spacing	NA 1	2	3	4	5
9. Ensuring timely weed control	NA 1	2	3	4	5
10. Ensuring fertilizer / manure application	NA 1	2	3	4	5
11. Ensuring pest control	NA 1	2	3	4	5
12. Ensuring disease control	NA 1	2	3	4	5
13. Ensuring collection of yield data from clients	NA 1	2	3	4	5
14. Ensuring processing of produce	NA 1	2	3	4	5

15. Ensuring storage and preservation of produce NA 1 2 3 4 5

16. Ensuring market facilities are available NA 1 2 3 4 5

17. Ensuring training objectives are achieved NA 1 2 3 4 5

18. Ensuring clients get agric. information regularly NA 1 2 3 4 5

11. Farmers' perception of the effects of NGO intervention on agriculture

In the table below you are presented with three columns. In the middle column you have a series of variables (statements) on the effects of NGOs interventions on agricultural activities before and after the intervention. Read the statements in the middle column and circle the number to the left and right of the statement that best describes the perceived effects before and after NGO intervention. The numbers and their meanings are as follows:

My perception before NGO intervention: 1) Poor 2) Fair 3) Good
4) Very good 5) Excellent
My Perception after NGO intervention: 1) Poor 2) Fair 3) Good
4) Very good 5) Excellent

My perception before NGO intervention					Areas where NGO intervention has effect	My perception after NGO intervention				
1	2	3	4	5	Yield	1	2	3	4	5
1	2	3	4	5	Income	1	2	3	4	5
1	2	3	4	5	Quality of produce	1	2	3	4	5
1	2	3	4	5	Food security	1	2	3	4	5
1	2	3	4	5	Weed control	1	2	3	4	5
1	2	3	4	5	Use of fertilizer / manure	1	2	3	4	5
1	2	3	4	5	Land preparation	1	2	3	4	5
1	2	3	4	5	Housing of animals	1	2	3	4	5
1	2	3	4	5	Feeding of animals	1	2	3	4	5
1	2	3	4	5	Disease and pest control	1	2	3	4	5
1	2	3	4	5	Storage and preservation	1	2	3	4	5
1	2	3	4	5	Processing	1	2	3	4	5
1	2	3	4	5	Marketing	1	2	3	4	5

12. Livelihood

11.2 If your present income is better than your income before the NGO intervention, would you say that you can afford to

1. pay your children's school fees?   Yes [ ]   No [ ]   Don't know   [ ]

2. pay your family's health needs?   Yes [ ]   No [ ]   Don't know   [ ]

3. provide decent house for your family than before?

Yes [ ]   No [ ]   Don't know   [ ]

4. provide good clothing for the family? Yes [ ]   No [ ]   Don't know [ ]

5. provide your family with more food than before?

Yes [ ]   No [ ]   Don't know [ ]

13. Working Relationship

13.1 Please rate your working relationship with the service provider using the following grading scale.

1) Poor [ ]   2) Fair [ ]   3) Good [ ]   4) V. Good

[ ]   5) Excellent [ ]

13.2 In your opinion, which of the following factors contribute to a good working relationship between you and your service provider? You may select more than one option.

[ ] Credibility / trustworthiness of service provider

[ ] Friendliness

[ ] Competence of service provider

[ ] Mutual respect

[ ] Transparency of service provider

[ ] Commitment of service provider

Others (please specify)..

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13.3 Which of the following constraints do you consider to be a major limiting factor in your working relationship with the service provider? You may tick more than one option.

[ ] Coercion by service provider

[ ] Misunderstanding

[ ] Unreliability / deception

[ ] Rejection of your views

[ ] Argument

[ ] Backbiting

[ ] Complaining

[ ] Mistrust

[ ] Lack of respect

[ ] Prejudice

Others (please specify)...

....

13.4 In your opinion, which of the following would you recommend for improving the working relationship with your service provider? You may select more than one option.

[ ] Frequent / regular visit by service provider

[ ] Increased financial assistance

[ ] Regular Monitoring & Evaluation activities

[ ] More technical advice from service provider

[ ] Regular training by service provider

[ ] Demonstration of new practices by service provider

[ ] More group discussion

[ ] Timely supply of inputs

Others (please specify) ....

....

Thank you.

APPENDIX III

QUESTIONNAIRE FOR PROJECT MANAGERS OF NGOs

Please read through the following items and provide answers which best describes the situation in your organisation. All information provided will be treated as confidential. Thanks for your co-operation with this study.

NGO:...

District:...

Date:..

1. Characteristics of NGO

1.1 How would you describe your NGO?   1. Secular   [ ]

2. Religious   [ ]

1.2 Please indicate the origin of your NGO.   1. Local   [ ]

2. Foreign   [ ]

1.3 In which year did you start operating in Ghana?

....

1.4 In which year did you start operating in the Central region?

....

1.5 What are your main areas of operation in agriculture?

....

....

....

1.6 Please indicate the number of communities in which you support

agriculture in the district..

2. Mode of operation of NGO.

2.1 Please indicate the procedures used in selecting your clients.

	Yes	No.
Personal contact	[ ]	[ ]
Contact with chiefs	[ ]	[ ]
Contact With MoFA Staff	[ ]	[ ]
Contact with opinion leaders	[ ]	[ ]
Contact with co-operatives	[ ]	[ ]
Contact with farmers' associations	[ ]	[ ]
Information from the community	[ ]	[ ]

2.2 Please indicate the factors you considered in selecting your clients. You can select more than one option.

	Yes	No
Gender	[ ]	[ ]
Age	[ ]	[ ]
Status/position	[ ]	[ ]
Farm experience	[ ]	[ ]
Size of enterprise	[ ]	[ ]
Membership of farmers/ social/ business org.	[ ]	[ ]
Educational status	[ ]	[ ]
Farm enterprise	[ ]	[ ]
Poverty Status	[ ]	[ ]
Expressed Need	[ ]	[ ]
Credit worthiness	[ ]	[ ]
Ability to work hard	[ ]	[ ]

Ownership of land   [ ]   [ ]

Ability to work with a group   [ ]   [ ]

Others(Pleasespecify)

....

....

3. NGO support services

3.1 Please indicate the services or assistance your NGO rendered to your

clients in the district.

	Yes	No.
Credit (cash)	[ ]	[ ]
Input	[ ]	[ ]
Training	[ ]	[ ]
Technology transfer	[ ]	[ ]
Agric Information /support	[ ]	[ ]

Others (Please specify) ....

....

4. Relevance / Adequacy of Service

4.1 For each extension service indicated, kindly choose by circling an option

that best applies to you. Please use the rating scales below.

Adequacy of service: 1) Not adequate   2) Fairly adequate

3) Adequate 4) Very adequate   5) Excellent.

Relevance of service: 1) Not relevant   2) Fairly relevant

3) Relevant   4) Very relevant   5) Excellent

Farmers' perception about the provision of services.

Type of service	Rating of services provided									
	Adequacy of service					Relevance of service				
Credit (cash)	1	2	3	4	5	1	2	3	4	5
Input	1	2	3	4	5	1	2	3	4	5
Training	1	2	3	4	5	1	2	3	4	5
Technology transfer	1	2	3	4	5	1	2	3	4	5
Agricultural information	1	2	3	4	5	1	2	3	4	5

5.0 Credit

5.1 Did you provide credit facilities to all your clients?

Yes [ ]   No [ ] ....

5.2 If No, give reasons. ....

....

....

5.3 If Yes, in what form was credit given to the clients?

1. Cash [ ]   2. Kind [ ]   3. Cash and Kind [ ]

5.4 How is credit provided to the clients?

1. Through the bank [ ]   2. Directly by NGO [ ]

5.5 What are the conditions to be met by clients to qualify for credit?

....

....

....

5.6 Give your opinion on the procedure for granting credit. Use the following grading scale.

1) Very easy   [ ]   2) Easy [ ]   3) Fairly difficult [ ]

4) Difficult   [ ] 5) Very difficult   [ ]

5.7 Use the following rating scale to indicate the interest rate on the credit you provide to your clients.

1) Very low [ ]   2) Low [ ]   3) Moderate [ ]   4) High

[ ]   5) Very High [ ]

5.8 What is the interest rate (%) on the credit facility given to clients?

....

5.9 Was credit provided on time?   Yes [ ]   No [ ]

5.10 Please list the various ways you expect your clients to use the credit.

....

....

5.11 In what form is credit recovered from farmers?

1. Cash   [ ]   2. Kind   [ ]   3. Cash and kind   [ ]

5.12 Did you have difficulty recovering loans granted to clients?

1) Yes   [ ]   2) No   [ ]

5.13 Give reasons for your answer to Q5.14.

....

....

6.0 Inputs

6.1 Which of the following inputs do your clients need for production?

1) Seeds [ ]   2)Seedlings [ ]   3)Hand tools [ ]

4)Fertilisers/ manure [ ]   5)Other agro-chemicals [ ]

6)Tillage equipment [ ]   7)Processing plant [ ]   8) Storage and preservation facilities [ ]   9) Market facilities [ ]   10) Animals [ ]   11) Animal houses [ ]   12) Animal feed [ ]

13) Drugs/vaccines [ ]   14) Oven [ ]   15) Trays[ ]

16) Fuelwood [ ]   17)Water containers [ ]

18) Baskets / crates [ ]   19) Packaging materials [ ]

20) Hive [ ]   21) Bee suit [ ]   22) Smoker [ ]

Others (please specify)...

6.2 Please use the rating scale below to indicate your feelings about the availability and cost of inputs you supplied to your clients. Circle the option that is appropriate.

Availability of inputs.... 1) Not available   2) Barely available

3) Available   4) Readily available

Cost of inputs...... 1) Very cheap   2) Cheap

3) Moderately expensive   4) Expensive   5) Very expensive

NA - Not applicable

Inputs	Availability of inputs						Cost of inputs				
Crops											
1. Planting materials	NA	1	2	3	4	5	1	2	3	4	5
2. Seedlings	NA	1	2	3	4	5	1	2	3	4	5
3. Hand tools	NA	1	2	3	4	5	1	2	3	4	5
4. Fertilisers / Manures	NA	1	2	3	4	5	1	2	3	4	5
5. Other Agro-chemicals	NA	1	2	3	4	5	1	2	3	4	5
6. Tillage equipment	NA	1	2	3	4	5	1	2	3	4	5
7. Processing plants	NA	1	2	3	4	5	1	2	3	4	5
8. Storage and preservation facilities	NA	1	2	3	4	5	1	2	3	4	5
9. Market facilities	NA	1	2	3	4	5	1	2	3	4	5
Livestock / Animals											
1. Animals	NA	1	2	3	4	5	1	2	3	4	5
2. Housing/Hive	NA	1	2	3	4	5	1	2	3	4	5
3. Animal feed	NA	1	2	3	4	5	1	2	3	4	5
4. Drugs / vaccines etc.	NA	1	2	3	4	5	1	2	3	4	5
5. Bee suit	NA	1	2	3	4	5	1	2	3	4	5
6. Smoker	NA	1	2	3	4	5	1	2	3	4	5
Fish											
1. Oven	NA	1	2	3	4	5	1	2	3	4	5
2. Trays	NA	1	2	3	4	5	1	2	3	4	5
3. Fuelwood	NA	1	2	3	4	5	1	2	3	4	5
4. Water container	NA	1	2	3	4	5	1	2	3	4	5
5. Baskets / Crates	NA	1	2	3	4	5	1	2	3	4	5
6. Packaging materials	NA	1	2	3	4	5	1	2	3	4	5

6.3 Were input deliveries timely?   1) Yes [ ]   2) No [ ]

6.4 If No, give reasons. ....

....

7.0 Training

7.1 Indicate the method used by your NGO for training the clients. Please

tick the appropriate response.

	Yes	No
Farm visit/site visit	[ ]	[ ]
Home visit	[ ]	[ ]
Group Discussion	[ ]	[ ]

Method demonstration   [ ]   [ ]

Result demonstration   [ ]   [ ]

Lecture   [ ]   [ ]

Others (Please specify). ....

....

7.2 In your opinion what method of training is most preferred by clients?

....

....

7.3 How often did you hold meetings with clients?

1) Once a month [ ]   2) Twice a month [ ]

3) Thrice a month [ ]

4) More than four times a month [ ]

5) Others (please specify) ....

8.0 Technology Transfer

8.1 Please list the technologies your NGO has transferred to clients to assist

in their agricultural activities ....

....

....

....

9.0 Monitoring and Evaluation

9.1 Do you carry out Monitoring and Evaluation activities on your projects?

Yes [ ]   No [ ]

9.2 If no, skip to Q 10.5.

9.3 If yes, kindly indicate the method / design you use for Monitoring and Evaluation.

1) Questionnaires [ ]   2) Field observation [ ]

4) Others: (specify) ....

....

9.4 Please indicate the extent to which your organization participates in the following Monitoring and Evaluation activities. Circle the appropriate response using the grading scale below.

1) Very Low   2) Low   3) Average   4) High   5) Very high

	1	2	3	4	5
1. Ensuring timely credit delivery	NA 1	2	3	4	5
2. Ensuring credit is used for the right purpose	NA 1	2	3	4	5
3. Ensuring credit is recovered from clients	NA 1	2	3	4	5
4. Ensuring that farm inputs arrive on time	NA 1	2	3	4	5
5. Ensuring inputs supplied to farmers are adequate	NA 1	2	3	4	5
6. Ensuring good land preparation	NA 1	2	3	4	5
7. Ensuring early planting	NA 1	2	3	4	5
8. Ensuring correct spacing	NA 1	2	3	4	5
9. Ensuring timely weed control	NA 1	2	3	4	5
10. Ensuring fertilizer / manure application	NA 1	2	3	4	5
11. Ensuring pest control .	NA 1	2	3	4	5
12. Ensuring disease control	NA 1	2	3	4	5
13. Ensuring collection of yield data from farmers	NA 1	2	3	4	5
14. Ensuring processing of produce	NA 1	2	3	4	5
15. Ensuring storage and preservation of produce	NA 1	2	3	4	5

16. Ensuring market facilities are available   NA 1 2 3 4 5

17. Ensuring training objectives are achieved   NA 1 2 3 4 5

18. Ensuring farmers get agric. information regularly NA 1 2 3 4 5

9.5 Use the rating scale below to indicate the extent to which you believe the following factors influence your outfit's ability to carry out Monitoring and Evaluation. Circle the option that best applies to you.

1) Very negatively   2) Negatively   3) Neutral   4) Positively

5) Very Positively

	1	2	3	4	5
Field supervision	1	2	3	4	5
Logistics	1	2	3	4	5
Commitment of staff	1	2	3	4	5
Commitment of clientele	1	2	3	4	5
Budgetary resources	1	2	3	4	5
Implementation of Monitoring and Evaluation findings	1	2	3	4	5
Manpower and Staff	1	2	3	4	5
Analytical skills	1	2	3	4	5
Data processing equipment	1	2	3	4	5

Others (please specify) ....

10.0 Perception of the effects of NGO intervention on agriculture.

9.1 In the table below you are presented with three columns. In the middle column you have a series of variables (statements) on the effects of NGOs interventions on agricultural activities before and after the intervention.

Read the statements in the middle column and circle the number to the left and right of the statement that best describes the perceived effects **before** and **after** NGO intervention.

The numbers and their meanings are as follows

My perception before NGO intervention: 1) Poor 2) Fair 3) Good 4) Very good 5) Excellent

My Perception after NGO intervention: 1) Poor 2) Fair 3) Good 4) Very good 5) Excellent

My perception before NGO intervention					Areas where NGO intervention has effect	My perception after NGO intervention				
1	2	3	4	5	Yield	1	2	3	4	5
1	2	3	4	5	Income	1	2	3	4	5
1	2	3	4	5	Quality of produce	1	2	3	4	5
1	2	3	4	5	Food security	1	2	3	4	5
1	2	3	4	5	Weed control	1	2	3	4	5
1	2	3	4	5	Use of fertilizer / manure	1	2	3	4	5
1	2	3	4	5	Land preparation	1	2	3	4	5
1	2	3	4	5	Housing of animals	1	2	3	4	5
1	2	3	4	5	Feeding of animals	1	2	3	4	5
1	2	3	4	5	Disease and pest control	1	2	3	4	5
1	2	3	4	5	Storage and preservation	1	2	3	4	5
1	2	3	4	5	Processing	1	2	3	4	5
1	2	3	4	5	Marketing	1	2	3	4	5

11. Livelihood

11.2 If your client's present income is better than his/her income before the

NGO intervention, would you say that he/she can afford to

1. pay his/ her children's school fees? Yes [ ]

   No [ ] Don't know [ ]

2. pay his/her family's health needs? Yes [ ]

No [ ] Don't know [ ]

3. provide decent house for his/her family than before?

     Yes [ ]   No [ ]   Don't know [ ]

4. provide good clothing for his /her family? Yes [ ]

     No [ ]   Don't know [ ]

5. provide his/her family with more food than before?

     Yes [ ]   No [ ]   Don't know [ ]

12. Working Relationship

12.1   Please rate your working relationship with the clients using the following grading scale.

     1) Poor [ ]   2) Fair [ ]   3) Good [ ]

     4) V. Good [ ]   5) Excellent [ ]

12.2 In your opinion, which of the following factors contribute to a good working relationship between you and your clients? You may select more than one option.

     [ ] Credibility / trustworthiness of clients

     [ ] Friendliness

     [ ] Competence of clients

     [ ] Mutual respect

     [ ] Transparency of clients

     [ ] Commitment of clients

     Others (please specify)...

12.3 Which of the following constraints do you consider to be a major limiting factor in your working relationship with the clients? You may tick more than one option.

[ ] Coercion by client

[ ] Misunderstanding

[ ] Unreliability / deception

[ ] Rejection of your views

[ ] Argument

[ ] Backbiting

[ ] Complaining

[ ] Mistrust

[ ] Lack of respect

[ ] Prejudice

Others (please specify)...

12.4 In your opinion, which of the following would you recommend for improving the working relationship with your clients? You may select more than one option.

[ ] Frequent / regular visit

[ ] Increased financial assistance

[ ] Regular Monitoring & Evaluation activities

[ ] More technical advice from service provider

[ ] Regular training of clients

[ ] Demonstration of new practices to farmers

[ ] More group discussion

[ ] Timely supply of inputs

Others (please specify) ....

THANK YOU