THE INFLUENCE OF TRAINING EXTENSION WORKERS ON FARM PRODUCTIVITY: A CASE STUDY OF AGRA- NAIROBI COUNTY, KENYA.

BY

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DECLARATION

I hereby declare that this research project is original and has not been presented in any form of any nature by any individual or any group of individuals, for award of a degree in any other university.

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DEDICATION

This research project report is dedicated to my daughter,Nailantei Nyambura Muriuki and my husband, Daniel Timothy Muriuki, who have been a great source of motivation and inspiration.

I would also like to dedicate this research report with my deepest gratitude to my family for their unflagging love and support throughout my life; this research project report is simply impossible without them. I am indebted to my father and mother, Mr. Philip Maina and Mrs. Penina Maina, for their care, love and support as well as my sister Carol Njeri Maina and my mum in-law, Mrs. Margaret Nginya, who have supported me all the way since the beginning of my studies.

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Finally, this report is dedicated to all those who believe in the richness of learning.

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LIST OF ABBREVIATIONS AND ACCRONYMS

ADB: -	African Development Bank
AGRA: -	Alliance for a Green Revolution Africa
ASIP:-	Agriculture Sector Investment Programme
BMGF:	Bill and Melinda Gates Foundation
CAADP:-	Comprehensive Africa Agriculture Development Program
CAP :-	Community Action Plans
CEW: -	Community Extension Worker
DFID:-	Department for International Development
FSR/E:-	Farming Systems Research and Extension
GoK :-	Government of Kenya
IFAD :-	International Fund for Agricultural Development
MDG:-	Millennium Development Goal
NAEP :-	National Agricultural Extension Policy
NALEP :-	National Agriculture and Livestock Extension Program
NEP :-	National Extension Program
NEPAD:-	New Partnership for Africa's Development
NGO's: -	Non-governmental organizations
RF :-	Rockefeller Foundation
SIDA:-	Swedish international Development Cooperation Agency
SPSS: -	Statistical Package for social Sciences
SSA:-	Sub-Saharan Africa
T&V:-	Training and Visit
WB: -	World Bank
WFP :-	World Food Programme
UK :-	United Kingdom
UN: -	United Nations

ABSTRACT

Alliance for a Green Revolution in Africa (AGRA) works to achieve a food secure and prosperous Africa through the promotion of rapid, sustainable agricultural growth based mechanisms on smallholder farmers. In implementation of its vision, AGRA has faced a multitude of challenges in empowering the community. This is because it seeks to empower farmers in diverse locations and with varying cultures. Extension workers at AGRA are therefore constantly equipped with skills to address such a multivariate society. One of the leading challenges for organizations in the current day has been developing and implementing effective training programs to enhance farm productivity, sustainability and development. This study therefore sought to establish the influence of training extension workers on farm productivity. The type of training, mode of training and level of education of extension workers were assessed on how it affects the volume of produce, quality of produce and food security. The purpose of this research study was therefore to determine influence of training of extension workers on farm productivity. The population under study was AGRAs' extension workers and the extension support staff, Nairobi County who were 38 in total. This was a descriptive study in nature and it worked to find out the influence of training on farm productivity. A questionnaire was used as the main tool of data collection. The research was essentially qualitative and the researcher administered questionnaires. Interviews were used as well. The quantitative data will be analyzed using SPSS version 18. On the other hand, the qualitative data was organized in an on going process according to the themes, sub-themes, categories and sub-categories and presented in narrative forms. This study found that training of extension workers affects farm productivity. The study further revealed that mode of training of extension workers affects farms productivity to a great extent (81.1%). The mode of training mostly used to train extension workers in training sessions was participation followed by paternalism and persuasion. On the influences of the level of education of extension workers on farms productivity, the study concludes that the level of education affects farms productivity to a great extent. This study therefore recommends that AGRA should increase the frequency of training of the extension workers so as to equip them with information useful to the farmers which can subsequently lead to increase in farm productivity.

The study also recommends that extension workers should also seek more information from agricultural extension programs through their websites, that AGRA should recruit qualified extension workers and that further research studies should be carried out, in the area of challenges facing agricultural extension workers in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to the World Bank (2006), three out of every four poor people in developing countries live in rural areas – 2.1 billion living on less than $2 a day and 880 million on less than $1 a day - and most of them depend directly or indirectly on agriculture for their livelihoods. In much of Sub-Sahara Africa, agriculture is a strong option for spurring growth, overcoming poverty, and enhancing food security. This means that agricultural productivity growth is vital for stimulating growth in other parts of the economy. However, Sub-Saharan Africa (SSA) currently faces a serious challenge of producing enough food for its rapidly growing population (Dr Namanga - AGRA, 2010). Agricultural productivity growth and rural development is core to changing this dire prediction, as these would improve food supply, benefiting farmers who are food net sellers, as well as benefiting consumers who are food net buyers (Dr Adesina - AGRA, 2010).

In Kenya, it is not strange to find a woman bent under the sun, weeding maize in an arid field with a hoe and a child strapped on her back –this is a vivid image of rural poverty. For her large family and millions like her, the meager bounty of subsistence farming is the only chance to survive. While the worlds of agriculture are vast, varied, and rapidly changing, with the right policies and supportive investment at local, national, and global levels, today's agriculture offers new opportunities to hundreds of millions of rural poor to move out of poverty (World Bank, 2008). Agriculture is a vital development tool for achieving the Millennium Development Goal that calls for halving by 2015 the share of people suffering from extreme poverty and hunger (UN, 2000).

Evidence suggests that a viable extension system is critical to raising the productivity of the staple food crops and offers the best opportunity for lifting millions of people out of poverty (Evenson, 2001; Gautam, 1999).

Agricultural extension workers are men and women who assist farmers by helping them identify and analyze their agricultural production problems and become aware of the opportunities for improvement (Picciotto, 1997). The birth of the modern extension service has been attributed to events that took place in Ireland in the middle of the 19th century. Between the years 1845–51 the Irish potato crop was destroyed by fungal diseases and a severe famine occurred. As a result, the British Government arranged for "practical instructors" to travel to rural areas and teach small scale farmers how to cultivate alternative crops. This scheme attracted the attention of government officials in Germany, who organized their own system of traveling instructors. By the end of the 19th century, the idea had spread to the rest of the world and is extensively being used in the present day world (Nahdy, 2003). In Kenya, the agricultural extension dates back in 1900s, but its only notable success was in the dissemination of hybrid maize technology in the late 1960s and early 1970s. The goal was to develop a cadre of well-informed, village-level extension workers who would visit farmers frequently and regularly to provide relevant technical messages, and bring farmers' problems to the attention of researchers (Gautam, 1999).

Experiences and lessons documented in the World Development Report (WDR, 2008) indicate that an organized extension system capable of catalyzing uptake of technologies adapted to Africa's diverse agro-ecological conditions, and supported by institutionally enabling environment is critical to achieving a uniquely African green revolution. One example of these organizations is AGRA. AGRA works to achieve a food secure and prosperous Africa through the promotion of rapid, sustainable agricultural growth based on smallholder farmers. Smallholders--the majority women--produce most of Africa's food, and do so with minimal resources and little government support. AGRA's aims to ensure that these smallholders have what they need to succeed: good seeds and healthy soils; access to markets, information, financing, storage and transport; and policies that provide them with comprehensive support. Through developing Africa's high-potential breadbasket areas, while also boosting farm productivity across more challenging environments, AGRA works to transform smallholder agriculture to be highly productive, efficient, sustainable and competitive system, and do so while protecting the environment (Nahdy, 2003).

Although extension programmes have many different goals, most of them fall into one of two basic categories which include systems of communication that aim to change the behavior of rural people and systems of communication that aim to change the knowledge of rural people (MAAIF 2000). A close relationship between knowledge and behavior is thought to exist and hence changes in the former often lead to a change in the latter. If farmers and other rural people direct the extension towards their own needs, then the purpose of extension is changing knowledge. This knowledge helps rural people make their own decisions regarding farming practices. This approach to extension is closely related to non-formal education and concretization (MAAIF 2000). One such methodology of communication is training. This study aims to establish whether training of the extension has any impact on the farming productivity.

1.2 Statement of the Problem

Many government pro-poor objectives fail to be met due to inadequate extension strategies to interface between technical service providers and the implementing community. The mandate of AGRA is therefore to enable poor and vulnerable communities to create hybrid and sustainable food crops. In order to achieve set out targets, the community extension workers are charged with a responsibility to pass on scientifically tested, approved knowledge to the farmers. According to Ols, (1995), this initiative has been faced by a myriad of challenges that range from poor training opportunities offered to the community extension workers. Constant advancement in technology and scientific discoveries has also meant that prior training is always rendered redundant and farm productivity is therefore adversely affected by the level of education of extension workers, the mode of training used and the type of training offered. Therefore, this study seeks to investigate if the training of extension workers has any influence farming productivity.

1.3 Research Objectives

The general objective of this study was to establish whether training of extension workers has any impact on the farming productivity. This was guided by the following **specific objectives**:

1. To determine the extent to which training of extension workers influences farm productivity in Nairobi County.
2. To determine the extent to which the mode of training employed in training extension workers has influences farming productivity in Nairobi County.
3. To determine the extent to which, the level of education of extension workers influences farm productivity in Nairobi County.

1.4 Research Questions

To help the researcher achieve the above objectives, the following research questions were used:

1. How does training of extension workers affect farm productivity in Nairobi County?
2. To what extent does the mode of training employed in training extension workers influence farm productivity in Nairobi County?
3. How does the level of education of extension workers influence farm productivity in Nairobi County?

1.5 Significance of the Study

The finding of this study if found to be positive, shall be of great importance to the programme managers in coming up with practical ways in which AGRA can adopt to enhance farm productivity. Moreover, the study finding will help the extension workers by enabling them understand the various training options and communicating with their supervisors on their training needs. Further, the study findings provided more insight to the field of research especially in the field of human resource management. Finally, the study finding was expected to enable the government, policy-makers, project managers and researchers direct the topics addressed in training and projects undertaken on purpose of extension to not only change behavior but also enhance productivity.

1.6 Scope of the Study

The study targeted AGRA which is an NGO and works to achieve a food secure and prosperous Africa through the promotion of rapid, sustainable agricultural growth based on smallholder farmers. However, the study focused on AGRA-Nairobi County. All the stakeholders ranging from AGRA top management, the farmers and extension workers

were included in the study. The study also involved the human resource department who gave an insight on what procedures they use to decide the training materials.

1.7 Limitations of the Study

This study anticipated some challenges which ranged from the mode of data collection. A questionnaire was essentially used as the primary data collection tool. This brings about a challenge since the research had to rely on self-reporting of the sample population. The self-reporting would result in inaccurate data because the respondents may give society desirable responses instead of the true scenario. Personal interviews were also employed alongside the questionnaire to triangulate the survey findings. Availing documents particularly dealing with the training and farm productivity was a big challenge. However, good interpersonal approach during the face to face encounter with the respondents and emphasis on the value of the study impressed upon them to respond objectively.

1.8 Basic assumptions of the Study

This study assumed that training offered to extension workers affected farm productivity. There was also an assumption that the level of education of extension workers and mode of training employed had an impact on productivity. This study therefore sought to establish the truths in these facts. The respondents are also assumed to be in a position to understand the questions in the interview schedule and respond objectively. Respondents with difficulties were interviewed. Most of the respondents were expected to be conversant with the training processes at AGRA and that they took the exercise as a positive undertaking towards streamlining the training opportunities available and hence provide an objective response to the study.

1.10 Definitions of Significant Terms

The Community is described as group of people living and or working in defined geographical and social boundaries; has leadership and decision making processes; and consists of diverse social, cultural and economic groups. They are the direct or indirect beneficiaries of the extension services.

Agricultural extension workers are personnel who are responsible for meeting the goals of extension system. They are intermediaries between research (or any other source

providing new information) and farmers. They operate as facilitators and communicators helping farmers in their decision making and ensuring that appropriate knowledge is implemented in order to obtain the best results in terms of sustainable production and general rural development.

The Community Extension Worker is the main actor, living and deriving a livelihood within the community, but is not necessarily born there. S/he is accessible and understands the community's strengths, vulnerabilities and aspirations better than usually more educated, professional extension agents. S/he knows the language and has intrinsic understanding of community cultural norms, customs and practices. Community Extension Workers are capable animators who can persuade or attract others to good farm practices through teaching, visiting and demonstration in the process of carrying out their farm work.

Productivity: Is the ability to farm and produce more crop yields, which meet or surpass the set out targets. It shall entail comparison of the amount of food crop produced in regard to resources used.

Training refers to the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge that relate to specific useful competencies

Community Training: It entails development of the way outside traditional work skills and knowledge, and creates far more exciting, liberating, motivational opportunities.

Mode of training: This is a way or manner in which training occurs or is experienced, expressed, or done.

Type of training: a kind, class, or category of training, the constituents of which share similar characteristics

Level of education of extension workers: A relative degree, as of achievement, intensity, or concentration in academia.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Agricultural extension programmes are quite diverse from an international perspective. Most are managed as public sector agencies, usually located in the ministry of agriculture, but some are located in other ministries such as education or rural development. Many are managed by nongovernmental organizations (NGOs). Many private firms and private organizations (for example, coffee-growers' associations) conduct extension programmes. Even within the most typical organizational structure, where extension is part of the government's ministry of agriculture, there is great variation in the degree of decentralization of management of extension services. In some countries, extension is decentralized, as in India, where it is a state subject. In most developing countries, however, governmental services are highly centralized, with varying forms of regional and sub-regional units designed to serve local areas.

Further, there is great variation in the skill level and agricultural competence of field staff. In some systems, field staff have little formal technical training in the agricultural sciences. In some cases, this is dictated by a village worker philosophy, in others by local language demands. But, in most cases, it simply is the result of the decisions to expand agricultural extension programmes rapidly during the 1950s and 1960s, when few highly trained agriculturalists were available (Bindlish & Evenson, 1993 and Bindlish, Gbetibouo, and Evenson 1993). It is widely recognized that increasing agricultural production is, in many parts of the developing world an important component of a strategy to increase incomes, reduce hunger and contribute to the improvement in other measures of well-being. Doing so requires improvements in the productivity of factors of production. As Birkhaeuser, Evenson and Feder (1991), Evenson (1998) and others have argued, agricultural extension represents a mechanism by which information on new technologies, better farming practices and better management can be transmitted to farmers. It is not surprising, therefore, that considerable amounts of funds, running into the hundreds of millions of dollars, are disbursed annually in support of agricultural extension. It is also not surprising that the impact of agricultural extension has received considerable attention. Birkhaeuser, Evenson and Feder (1991) review 15 studies published between 1970 and 1989 on the impact of extension (typically measured by

some form of contact with an extension agent) on farm productivity (output per unit area) or output (expressed in physical or monetary terms). Restricting ourselves to only those studies that use linear regression techniques, their review reports 26 estimates. Eleven estimates are statistically significant at the 90% per cent confidence level or higher, with the highest estimate indicating that contact with extension services raises output by 27 per cent.

Rural and agricultural development is integral to any strategy to alleviate poverty and promote broad-based growth in Kenya. To this end, the government adopted the T&V system of agricultural extension in 1982 with support from the World Bank. The performance of the extension system has been challenged ever since. The debate on the effectiveness of Kenya's extension system is part of a broader discussion of the cost-effectiveness of the T&V approach (Judd Boyce and Evenson, 1986). The disagreement centres on the returns to the heavy investment of borrowing countries in the T&V system. But despite the large investment and the important role of agricultural extension in the Bank's development strategy for Africa, few attempts were made to rigorously measure the impact of its projects. The debate in Kenya was prompted by the lack of visible results in agricultural performance. The high estimated returns to T&V extension in Kenya, put forward by one of the few studies on the economic impact of T&V, further fuelled the controversy. Both donors and nongovernmental organizations (NGOs) have been sharply critical of current extension practices, and seek reforms to make the system more demand-driven and accommodating of alternative ways of reaching farmers. The OED evaluation adopted an empirical approach to assess the impact of NEP I and II. A household survey was undertaken to revisit households surveyed in 1982 and 1990 to create a panel data set. These data were complemented by an extension staff survey, existing secondary statistics, beneficiary assessments, and reports and other documents. The evaluation was based on a conceptual impact model that underpinned the design of NEP I and II. Following the results-based management framework, the key indicators for the expected outcomes and results were measured, and related to the projects' input and output indicators.

2.2 Agriculture extension in Africa

In the past decade Africa has been experiencing a food crisis which has now taken astronomical proportions hence the current attention it is receiving globally. The economic, social and political costs of this food crisis are high and pose significant threats to whatever good economic growth that African countries have achieved over the past decade (Koenker, Roger and Gilbert, 1978). The net impact of the high food prices is highest for poor net buyers of food in a continent where more than 300 million people live on less than a dollar per day. Many are at risk of falling deeper into poverty. Being the only region of the world where per capita food production has been declining for the past three decades, Africa faces huge challenges in producing enough food to feed its rapidly growing population.

The challenge is serious because population growth rates have exceeded the productive capacity of the continent's current food systems. Agricultural productivity growth and rural development is central to turning this dire prediction around. Growth in agricultural productivity will improve the supply of food, benefiting farmers who are net sellers of food, while also benefiting consumers who are net buyers of food. Evidence suggests that raising the productivity of the staple food crops offers the best opportunity for lifting millions of farmers out of poverty. This will require concerted efforts to expand the availability of appropriate improved varieties of crops grown by farmers including solving the problems of water management practices and soil fertility that hinder productivity growth, improving farmers knowledge and awareness of new technologies, improving markets access to farmers and improving the overall policy environment to create the necessary incentives (Lionberger and Chang, 1970).

The successful implementation and achievements of these efforts will depend on individual actions of millions of rural families and smallholder households (majority of whom are women) whose decisions are shaped by the information and resources available to them. Extension, defined broadly as the rural knowledge and innovation system, is therefore the key to informing and influencing these smallholder and rural household decisions. Although the role of extension (knowledge, related information, skills, technologies and attitudes) has been identified as being crucial to sustainable intensification of agriculture and sustainable rural development, it has been reported that

rural areas lag behind urban areas in their access to information, similarly developing countries tend to lag behind industrialized countries. This gap jeopardizes the ability of smallholder farmers and rural households to realize their full potential and improve their social, economic, and environmental conditions**.**

However, as experiences around developing countries have shown, achieving rapid agricultural growth that lifts millions out of poverty requires strong political will and commitment. This is now happening in Africa as African governments realized a few years ago that they had to redirect resources to agriculture. Hence in 2003, African Heads of State and Government endorsed the Comprehensive Africa Agriculture Development Program (CAADP) of the New Partnership for Africa's Development (NEPAD).

In response to CAADP and the political will for a green revolution demonstrated by African leaders, the Rockefeller Foundation (RF) and the Bill and Melinda Gates Foundation (BMGF) established the Alliance for a Green Revolution in Africa (AGRA). With offices in Nairobi, Kenya and Accra, Ghana, The Alliance for a Green Revolution in Africa is a broad-based partnership dedicated to helping millions of smallholder African farmers, most of whom are women, to lift themselves and their families out of poverty and hunger by dramatically improving their productivity, food security and incomes. The United Kingdom (UK) Department for International Development (DFID) has joined the Alliance as a core funding partner. AGRA has established strategic partnerships with UN agencies, especially the Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), the World Food Programme (WFP); as well as the Millennium Challenge Corporation (MCC) and the African Development Bank (ADB). AGRA is a partnership platform and is actively looking forward to developing additional partnerships with other appropriate donor organizations in the coming years.

2.3 Evolution of extension services in Kenya

In Kenya, agricultural extension has evolved in tandem with the changing theories of development. Early extension models followed a 'cookbook' approach to new technology through state–provided extension services (McMillan et al., 2001). Until 1965, technologies were developed and run through extension pipeline to farmers, with

agricultural development being the desired product. This was a top-down approach, where information originated from the Ministry of Agriculture and filtered down to farmers through extension agents. The system was not accountable to farmers. Hence, farmers were not involved in development of the disseminated technologies. Research and extension systems were focused mainly on large-scale farms or smallholders in high and medium potential areas. Trials and demonstrations were mostly undertaken on research stations (Davis and Place, 2003).

In order to reinforce technology transfer, the government had to put in place new models, focusing on the needs of small-scale and resource-poor farmers. This led to the introduction of the farming systems approach. The Farming Systems Research and Extension (FSR/E) model was operational between 1965 and 1980, as a response to the concern for small-scale farmers, including those in marginal areas. This approach was characterized by participation at farm level through farmer input in on-farm trials, and by interdisciplinary linkages and a systems approach to agricultural extension services delivery (Collinson, 2000). The distinctive feature of the FSR/E model was its three-way linkage between farmers, researchers, and extension service providers.

The most notable success of the above-mentioned two pioneer agricultural extension models was in the dissemination of hybrid maize technology in the late 1960s and the early 1970s. However, these extension models had some deficiencies. They comprised of a mix of *ad hoc* project components and lacked a consistent national strategy. Overall, these arrangements were expensive and ineffective (Gautam, 1999). Additionally, despite a well-established line of command down to the frontline extension worker and staff numbers presumed to be adequate at the time, the agricultural extension services were judged to be performing below its potential (Gautam, 1999). In addition, although women made up almost one-third of the farmers, and most farmers (81 %) were smallholders, extension efforts largely focused on men and large farm owners. In response to the above mentioned deficiencies, the World Bank (WB) and the Government of Kenya (GoK) initiated the Training and Visit (T&V) agricultural extension system in 1982. This system had been used successfully in Turkey and India. Kenya was the first African country in which this model was applied (Farrington, 1998).

T&V was funded by the WB in two phases, under the National Extension Program (NEP) I and NEP II.

The objective of NEP I and II was to develop institutional arrangements that would facilitate delivery of agricultural extension services to smallholder farmers efficiently and effectively; through development of a cadre of well-informed, village-level extension workers who would visit farmers frequently and regularly. The role of the workers was to provide relevant technical messages, and bring farmers' problems to the attention of researchers. The extension staff was in-turn to receive regular training, with much improved research extension linkages. The T&V model expanded to cover about 90 % of the arable land in Kenya and used contact farmers to multiply their effects. The T&V model suffered because of poor project implementation arrangements, weak management and inadequate budgetary allocation, leading to persistence of problems experienced with earlier extension models. These inherent weaknesses of NEP I & II led to formulation of National Agriculture and Livestock Extension Program (NALEP) by the Ministry of Agriculture, Livestock Development and Marketing (MoALD&M) and Swedish international Development Cooperation Agency (SIDA). The positive aspects of NALEP were their wide coverage, strong staff training giving a strong frontline extension worker force, coupled with professionalism developed at the district-office level.

NALEP as a policy framework was designed to assist the implementation of the National Agricultural Extension Policy (NAEP). NAEP was prepared to bring on board both public and private service providers, as a way of finding means of addressing the complex, systematic issues that faces rural communities. This shift had been agitated by the recognition of the socioeconomic and agro ecological conditions of resource poor farmers as being complex, diverse and risk prone (Farrington, 1998). This strategy based on the Agriculture Sector Investment Programme (ASIP) concept, has been aimed at generating sustainable development in the agricultural sector through a more integrated and holistic approach (Kenya, 2001b). The NALEP is built on a partnership concept that entails deliberate investments and participation of various stakeholders in the agricultural sector. For example, beneficiary communities develop Community Action Plans (CAP), Farm Specific Action Plans (FSAP), and also participate in extension improvement

through Participatory Rural Appraisals (PRA) and Participatory Monitoring and Evaluation (PME). It also endeavors to make extension demand driven, increase efficiency in extension service provision, putting in place alternative funding apart from the exchequer, promoting gender issues and curbing environmental degradation. To be able to achieve this, NALEP has been organized around three core functions, i.e., (i) research; (ii) extension; and (iii) advocacy. Advocacy was to add value to the two other core functions by way of creating demand on the part of farmers for specific kinds of support, rather than technical and extension support for its own sake. The re-organization of agricultural extension services in Kenya provides an example of decentralization in a difficult context, partly due to lack of a comprehensive institutional framework to guide the process as well as the content. The extension system which encompasses soil-related information services has evolved to include four broad forms of delivery systems, based on modes of delivery and funding (Anderson and Van Crowder, 2000):

However, following the structural adjustment programs of the 1980s and 1990s, donors became interested in NGOs since they were private entities. This shift in development thinking strengthened the move towards decentralization and privatization, resulting in more attention being given to NGOs, who now play a major role in delivery of extension services in Kenya.

2.4 Mode of training

The term "extension" has been used to cover widely differing communication systems. Two particular issues help to define the mode of training of extension workers

2.4.1 Paternalism versus participation

Early books on extension often describe a model of training that involved the transmission of messages from "senders" to "receivers". As part of this model, senders are usually people in authority, such as government planners, researchers, and extension staff, while receivers are usually farmers who are relatively poor and uneducated. Although this model might include feedback, it is clear that the senders are in control of the communication process.

The transmission model of training is closely related to the idea that extension workers are the link (i.e. message carriers) between extension workers (senders) and farmers

(receivers). Extension programmes based on this model has been described as "paternalistic"; in other words, the actors in the communication process have a parent/child or teacher/student relationship. Other authors have used the term "top-down" to describe these programmes.

In many countries, paternalistic extension is gradually being replaced by more participatory approaches, in which the knowledge and opinions of farmers is considered to be just as important as that of researchers or government officials. Participatory approaches involve information-sharing and joint decision-making. The terms "interactive" and "bottom-up" have been used to describe these approaches (Gautam and Madhur, 1998).

The development of participatory extension requires a re-examination of the communication process. At the present time, no single description has replaced the transmission model that is referred to above, but two ideas are becoming widely accepted: communication in the context of participatory extension cannot usefully be described in a linear manner with distinct groups of senders and receivers. Instead, extension activities take place within a *knowledge system* consisting of many actors who play different roles at different times. Although some actors in the knowledge system have more authority than others, communication usually involves a *negotiation* rather than a transmission. What takes place is a dialogue, with actors collaborating in the construction of shared meanings rather than simply exchanging information (Lionberger and Chang, 1970).

The related, but separate field of agricultural communication has emerged to contribute to in-depth examinations of the communication processes among various actors within and external to the agricultural system. This field would refer to the participatory extension model as a form of public relations rooted two-way symmetrical communication based on mutual respect, understanding, and influence between an organization and its stakeholders (publics).

2.4.2 Persuasion versus education

Although extension programmes have many different goals, most programmes fall into one of two basic categories: systems of communication that aim to change the behaviour of rural people and systems of communication that aim to change the knowledge of rural

people There is, of course, a close relationship between knowledge and behaviour; changes in the former often lead to a change in the latter. If government policy-makers, project managers or researchers direct the topics addressed and projects undertaken, then the purpose of extension is to change behaviour (Schultz, 1964). This approach to extension has been variously described as directive extension, social marketing and propaganda.

If farmers and other rural people direct the extension towards their own needs, then the purpose of extension is changing knowledge. This knowledge helps rural people make their own decisions regarding farming practices. This approach to extension is closely related to non-formal education and concretization (Feder, Gershon, and Roger 1986).

2.5 Level of education of extension workers impact on farm productivity

Educational organizations that train extensionists are important elements in the institutional context for extension. The work of universities and training institutes in particular has a significant impact on extension organizations. The content of their curricula as well as the numbers and qualifications of their graduates are limiting or enabling factors in any country. In many cases, communication between extension and education organizations is poor. As a result, extension commonly has staffing problems. It is not unusual for extension organizations to have posts that are either vacant or filled by under qualified personnel. Inadequate numbers and qualifications of staff remain a difficult problem for public sector extension organizations. Salaries and benefits are rarely competitive with those of comparable private and public enterprises, resulting in low morale and high staff turnover (Appleton and Arsene, 1996)

Education levels may be quite low, especially for farmer contact staff. The ability to attract and retain qualified extension staff is limited in most countries by civil service salary scales established by other agencies of government. The situation can be improved by establishing staffing and training plans. The staffing plan inventories current human resources, identifies staffing gaps, and projects staffing needs over a specified time. The training plan identifies specific types of training (in-service and formal) required to fill skill gaps in human resources and to cover staffing needs for planned operations. The additional step of coordinating training needs with the educational organizations is needed (Bindlish and Robert, 1997).

2.6 Influence of training of extension workers on farming productivity

In these days of advanced technology, it is very easy for us to forget how dependent we are upon the farmer. Despite our complete dependence on food, the farmer is very often the least appreciated part of the community, particularly in many developing countries. He is expected to work long hours to produce his crops and livestock, for which he receives the lowest possible prices. In many cases, little heed is given to his hopes and fears, his aspirations and beliefs, his standing in the community and his value as a human being. In many ways, the only secular person to whom he can call on for help and understanding is his local farm extension worker (Blomme et el., 2003).

It is impossible to define the role of the extension worker in a few words, as he has to be all things to all men. However, he is expected to perform the following functions: to help farmers improve their living standards; help farmers achieve their long and short term objectives; make practical suggestions which will enable farmers to attain their goals; act as a link between farmers, researchers and planners; help farmers to devise methods of overcoming their problems. This is an innovative function, and is also problem-oriented; assist with the implementation of national policies; assist with the organization of farming structures (Birkhaeuser et al., 1991).

If an extension worker is to accomplish his work satisfactorily, he must have great skill and judgment, a deep understanding of people and a high level of technological expertise. He must show scientific competence and social responsibility. Extension work is often carried out by the lowest paid and most poorly educated members of the government service. Despite our increasing demand for better quality food and the need to introduce new technology to farmers, the task is often entrusted to high school graduates, who are expected to have the teaching ability of a schoolmaster, the skills of a successful farmer, the persuasiveness of a politician and the patience and understanding of a social worker. It is little wonder that agriculture is developing so slowly in many areas (Buchinsky and Moshe, 1994).

The ultimate aim of training agricultural extension workers is to produce extension workers who are professional officers, technically equipped to give farmers accurate advice on matters of plant and animal production, and mentally equipped to understand their farmers and their families so that they can motivate them wisely and

sympathetically, to produce officers who have a status in the community comparable with that of other professional people such as doctors, lawyers or school teachers. In other works, the extension worker must be a respected member of his society (Carloe, 2003).

Planners and politicians must be made to recognize the importance of well-trained extension officers and of the work they do, and pay them accordingly. At the present time, many extension workers are struggling to live on a salary which is far too low by any standards. When challenged about this, the politicians and employers point to the often low educational qualifications of these workers, and their relative lack of specific expertise, and say they cannot pay more under these conditions. If, however, training standards are raised and workers are much better qualified, they must be rewarded accordingly. A well-trained professional extension officer needs adequate facilities if he is to do his work satisfactorily. Among those is the provision of adequate transport. While it may be unrealistic to expect every developing country to provide cars for its extension workers, they should at least provide light motor cycles (Deaton, 1995)

A fully-trained extension officer must have job security. It is foolish to expect that young people will embark on a long and arduous course to qualify themselves, unless they can see permanent and rewarding employment as an end result. At present, many Asian extension workers are employed on a temporary basis _ under these conditions, they cannot be expected to give a dedicated and efficient service.

Until now, it has usually been considered that agricultural extension work is a male function and women in extension services have largely confined their efforts to helping farm women with matters such as hygiene, cooking, etc. The introduction of new crop varieties will demand that women folk be shown how to store, prepare and serve rather new foods (Evenson, 2001). Therefore, extension should also have a `home economics' function, with women as both clients and instructors.

In many countries, most of the work involved with food production is done by women, who do all the cultivation and harvesting and who deal with any financial details associated with their cropping activities. Since women are usually better than men in dealing with farmers' wives, there is obviously a need for women extension workers who

have been trained in crop and animal husbandry technologies. It is, of course, essential that such officers be available in countries where women are forbidden to speak to strange men.

Agricultural extension is an applied behavioural science, which is applied to bring about desirable changes in the behavioural complex of farming community, usually through various strategies and programmes of change, by applying latest scientific and technological innovation with an aim of improving the farming productivity. The system of extension was first used in the United States of America during the first decade of this century to connote the "extension of scientific agricultural production knowledge" from the agricultural colleges to the farming community through the process of informal education system (Benor, Harrison and Baxter, 1984)

During the Great Depression, state colleges and the USDA emphasized farm management for individual farmers. Extension agents taught farmers about marketing and helped farm groups organize both buying and selling cooperatives. At the same time, extension home economists taught farm women—who traditionally maintained the household—good nutrition, canning surplus foods, house gardening, home poultry production, home nursing, furniture refinishing, and sewing—skills that helped many farm families survive the years of economic depression and drought.

During World War II, the extension service again worked with farmers and their families, to secure the production increases essential to the war effort. Each year for 5 years, total food production increased. In 1944, food production was 38 percent above the 1935-1939 average. The Victory Garden Program was one of the most popular programs in the war period, and extension agents developed programs to provide seed, fertilizer, and simple gardening tools for victory gardeners. An estimated 15 million families planted victory gardens in 1942, and in 1943 some 20 million victory gardens produced more than 40 percent of the vegetables grown for that year's fresh consumption.

Between 1950 and 1997, the number of farms in the U.S. declined dramatically—from 5.4 million to 1.9 million. Because the amount of farmland did not decrease as much as the number of farms, the remaining farms have a larger average acreage. During the

same period, farm production increased from one farmer supporting the food needs of 15.5 persons in 1950 to one farmer supporting 100 persons in 1990. By 1997, one farmer supported the food needs of almost 140 U.S. citizens. That increased productivity, despite the decline in farm numbers, resulted from increased mechanization, commercial fertilizers, new hybrid seeds, and other technologies. Extension played an important role in extending these new technologies to U.S. farmers and ranchers (Buchinsky and Moshe, 1994).

At that time, more than 50 percent of the U.S. population lived in rural areas, and 30 percent of the workforce was engaged in farming. Extension's engagement with rural America helped make possible the American agricultural revolution, which dramatically increased farm productivity: In 1945, it took up to 14 labour-hours to produce 100 bushels of corn on 2 acres of land. By 1987, it took just under 3 labour-hours to produce that same 100 bushels of corn on just over 1 acre. In 2002, that same 100 bushels of corn were produced on less than 1 acre. That increase in productivity has allowed fewer farmers to produce more food. Fewer than 2 percent of Americans farm for a living today, and only 10 percent of Americans now live in rural areas. Yet, the extension service still plays an important role in American life—rural, urban, and suburban. With its unprecedented reach—with an office in or near most of the nation's approximately 3,000 counties—extension agents' help farmers grow crops, homeowners plan and maintain their homes, and children learn skills to become tomorrow's leaders.

Extension teaching is the process through which the extension workers stimulate interest in learning more by using various teaching methods, tools and techniques to improve the situation. This knowledge and skill should be so applied by the extension worker so as to arouse in them the interest to adopt the advanced scientific technology in their day-to-day practice.

Need for Adoption of Agricultural Extension System for Increased Productivity: The world population in 1990 was 1 billion, it became 2 billion by 1930, 3 billion by 1960 and by 2000 AD it is expected to touch 6.2 billion by 2005. However, in order to feed these teeming million the food demand will be in the order of 1550 billion tons at the rate of 250 kgs of cereal per capita and the world has already achieved in 1980 1587 billion tons of food production. Still hunger haunts the human race. The reason is not then the

shortage but lack of purchasing power. In fact food is used as a weapon by the developed countries. It should have been the task of mankind to assure the people of this world at large of their right to be free from hunger through increased production. Increased agricultural production can be brought about by advocating the advanced scientific knowledge to bring about changes in the production standards of those areas where the potential is not fully exploited to the level the science has achieved today. For instance, more emphasis on sustainable organic agriculture and tangle research into indigenous knowledge will lessen our dependence on expensive agro-chemicals, which rather more increases production cost and its adverse health and environmental consequences.

The extension education is the only means through which the desired transformations can be brought about in the agricultural land productivity of the farming community. It is in this perspective that technology development (through research) and technology transfer (through extension and education) have been identified as key inputs indispensable for developing and sustaining a productivity led agricultural sector. Yields are the eventual consequences of developmental efforts, and extension impact would be reflected more in yields than in other measures (Halkatti, 1998)

Research findings will be meaningless unless they are accepted by the farmers. The results of agricultural research should be available to the farmers through the network of extension system. Farmers are intelligent enough to adopt those technologies, which are beneficial and bring economic return. Now what is needed is healthy coordination between extension workers and research institutions in a more effective way. At present the coordination seems to be almost illusive. One can say with considerable confidence that if extension and research work together shoulder to shoulder there is no reason why we will not be able to achieve self-sufficiency in food in our country. But to achieve this goal and objective the prime need is pledge together to achieve together. To make the sector commercially profitable, economically more vibrant and self-sustaining, we need to do more and say less about the drive for modernizing agriculture.

2.7 The impact of extension on crop production with controls for farmer ability

Estimates of the impact of extension visits on crop production may be biased if unobserved farmer skill or ability is not taken into account. In their study Bindlish and Evenson, (1993) obtained measures in two occasions. In one occasion, extension agents

serving this sample were asked to rank each farmer on a scale of 1 to 5, with 1 representing low levels of ability, 3 representing "average" skill and a 5 denoting an "excellent" farmer. These rankings produced the following distribution of farmer ability: 12.8 percent of farmers were ranked as poor; 23.6 per cent were ranked as below average; 38.7 per cent were ranked as average; 16.6 per cent were ranked as above average; and 8.3 per cent were ranked as excellent. These rankings are included as a set of dummy variables; alternatively, including them as a continuous variable running from 1 to 5 has no substantive effect on our results. In the second occasion, they conducted a series of participatory rural appraisal exercises in 13 of the 22 villages in their sample. A component of this work involved asking extension agents working in these resettlement areas to rank households. Their initial intention was to have these individuals rank households on the basis of wealth and compare these rankings with those made by other community members. However, while the extension agents were willing to undertake this exercise, they indicated that could only do so by ranking farmers according to their perceptions of farmer ability. The extension worker was allowed to choose the number of ranking categories. Two of the extension workers ranked on a scale of 1 to 3, the other 2 on a scale of 1 to 4, with lower numbers reflecting a perception of poorer farming ability. In light of the use of different scales, they made the rankings comparable across agents by dividing the rankings by the number of categories. In their findings the pooled sample shows the impact of access to extension services without controls for either farmer ability or location. Controls for farmer ability, or farmer ability and village (but not household) fixed effects, are added in the next columns.

2.8 Impact of training of extension workers on farming productivity in Kenya

Extension workers focus on imparting key messages to farmers on each visit, with the complexity of these messages being increased in subsequent visits. Initial messages aim at improving basic production techniques, with attention being focused on land preparation, the timeliness of operations, crop spacing, plant population sizes, the use of better seed varieties and on weeding. After the simple messages, attention shifts to more complex messages such as those relating to fertilizer use and pest control measures. Implementation of the latter set of messages typically requires higher investment expenditure in purchased inputs by farmers. Other key features of the T &V system include the existence of a permanent cadre of subject matter specialists and regular

supervision and training of extension workers and regular meetings between the frontline extension workers and the subject matter specialists. These meetings serve as a feedback mechanism between the supervisors, frontline extension workers and farmers. The primary duties of the frontline extension agents under the T & V system is to transfer agricultural information to farmers and to report farmers' problems to higher levels of the system, especially to supervisors and the subject matter specialists.

The features of T & V described above refer to a well-functioning national system of agricultural extension. In Kenya both the T & V system and the traditional system of technology extension have suffered from poor supervision. Moreover, frontline extension staff are often unable to cover the required number of households because of lack of transport and because of impassable roads in the rainy season. However, even though Bindlish and Evenson (1993) show that annual government budget allocations to agricultural extension services in some districts declined substantially between 1981 and 1991, the budgetary constraint was not as binding in 1982 because of support and enthusiasm that existed for the new system at the time of its implementation. Thus, in the early days, lack of funds was probably not a major constraint on proper functioning of the national extension system, especially its Training and Visit component. However, the nature of linkage of the extension system with research stations (Purcell and Anderson, 1997), may have affected the availability of relevant farming technology that could be passed to farmers. At least in design, the T & V system is a substantial improvement over the traditional system despite *weaknesses* of public extension systems (Umali-Deininger, 1997; Purcell and Anderson, 1997). The identified weaknesses here, and over which there is no agreement (Anderson, 1997), concern cost ineffectiveness of national extension systems and non-availability of agricultural technology of the magnitude that merits a uniform machinery of transmission to farmers.

A study by Evenson, Robert, and Germano (1996) examined the effect of agricultural extension on farm productivity in Kenya controlling for other determinants of crop yields, such as schooling of farmers, labor and fertilizer inputs and soil quality, proxied by agro-ecological conditions. There were five main findings of the study. Productivity gains from agricultural extension are highest at the top end of the distribution of yield residuals, suggesting that agricultural extension may be enhancing unobserved

productive attributes of farmers such as managerial abilities. The U-shaped response of farm yields to extension services across quantiles that has been noted is probably due to a positive association between extension service with unobserved factors such farm management skills and possibly to errors in the measurement of extension.

The second noteworthy finding of this work is that increases in farm yields due to schooling generally rise with quantiles but these increments are not significant. Aguilar (1988) obtained negative productivity effects of schooling among Kenyan smallholders in Nyanza province but found positive effects in Central province. Evenson and Bindlish (1993) and Appleton and Balihuta, 1996) report mixed effects of schooling on farm productivity.

The third result is that public investment that makes market centers broadly available to farmers would improve farm productivity because distance from market centers reduces farm yields at all quantiles. This is so because there are large costs of transacting at distant markets. In addition to reducing farm profits, transactions costs weaken a farmer's ability to obtain purchased inputs such as fertilizers and sprays which complement other farm inputs, notably labor and land. The fourth finding of the paper is that extension services are more productive in farms with more fallow land than in farms with less fallow acreage. Periodic crop rotation, which is one activity initiated by extension agents at the farm level may be the process through which extension reinforces productivity of fallow land. Lastly, agro-ecological factors, which include soil quality and rainfall variability, *do* influence farm yields. If these factors are not taken into account in assessing production effects of extension services, their effects would be incorrectly measured.

2.9 Empirical review

In the Republic of Yemen the agricultural extension service is still largely the responsibility of the government through the ministry of agriculture. Over the last decade, extension service started experiencing some challenges due to socioeconomic changes and agricultural sector reforms taking place in the country.

Agricultural extension workers are personnel who are responsible for meeting the goals of extension system. However, there have been less data on the roles and performance of

extension workers in the country, even though there are sporadic studies on criticism that extension was not being able to perform the necessary changes in the rural community (Sallam and Akram 2005). Realizing this situation therefore it is very critical to know the leadership competencies of extension workers and how do these competencies influence their performance. Furthermore, in the contexts of agricultural extension; most international studies generally focus on evaluation of extension system and methodology rather than personnel. For example, economic evaluation of the performance extension system (Bindlish and Evenson 1993), economic impact of extension system of agriculture extension (Brikhaeuser 1991) and measuring performance indicators of paid-extension system (Dinar and Keynan 1998). However, it is rarely found a research that focusing on the aspects of extension workers' leadership competencies and their performance.

In this regards, Chamberlain and Gary (1994) asserted that studies concerning job performance evaluation in extension organization contexts are still limited. Since personnel performance is regarded as an important element of extension organization behavior. There is a strong necessity to determine further the relationships between the qualities of leader such as competencies in human development learning, leadership development, communication methods, extension program planning, and extension program implementation extension program evaluation, as well as organizational commitment and extension workers' performance.

Globally, several studies in agricultural extension contexts focus on evaluating the effectiveness of extension organizations from economical prospective. For example Deaton and Angus (1997) focused on assessing the impact of agriculture extension on farm production, farmers' adoption rate of the new technology disseminated by extension workers.

2.10 Conceptual framework

For the purpose of this study, a conceptual model shown below outlines independent, dependent, and intervening variables related to training of extension workers for farm productivity at AGRA- Nairobi.

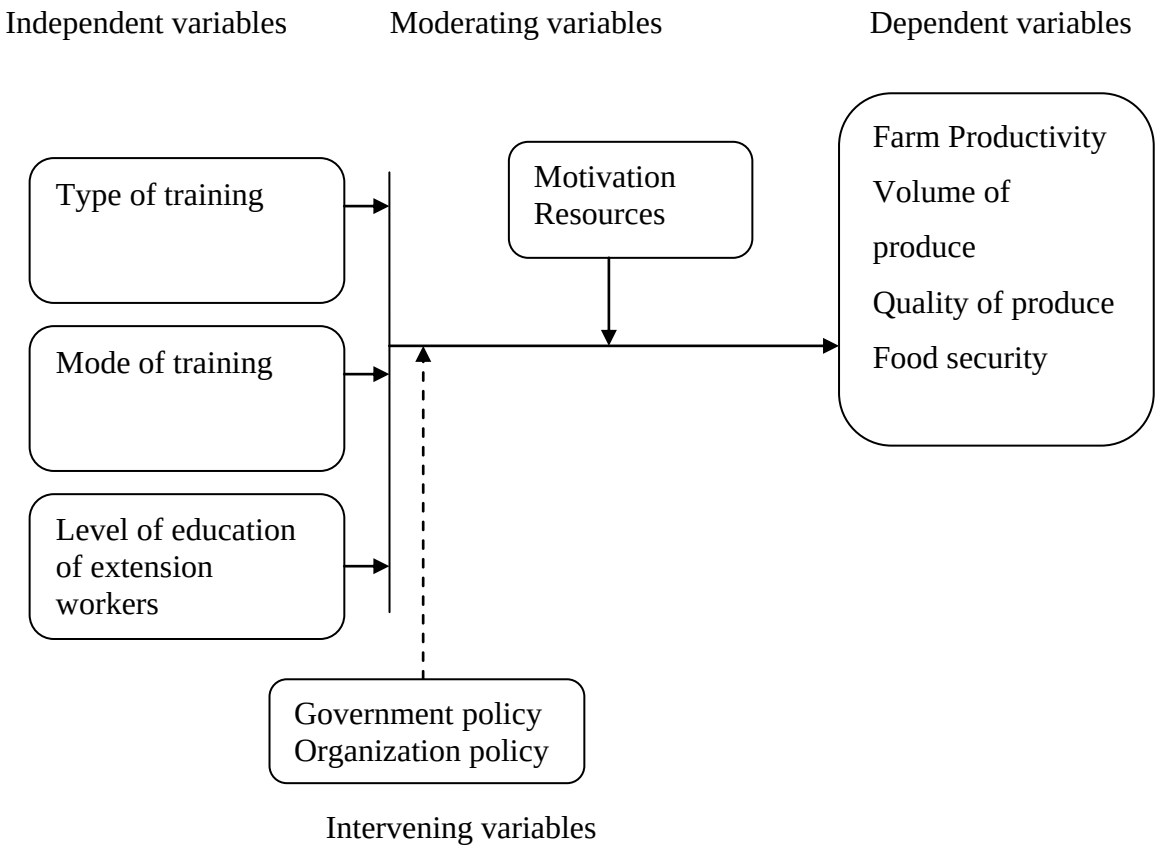

Figure 1: The conceptual framework

Government policy and organization policy influence productivity and are called intervening variables. The independent variables, which in this case are the type of training, mode of training and the level of education of extension workers impact on training whilst interacting with the intervening variables as well as the moderating variables, to influence the farm productivity and the organization as a whole.

2.11 Chapter summary

This chapter has presented a review of literature on training of extension workers and its influence on the farming productivity. The chapter began with an overview of the extension workers. This was followed by agricultural extension in Africa, evolution of extension services in Kenya, mode of training, the impact of the level of education on farm productivity, impact training of extension workers on farm productivity, an empirical review and conceptual framework.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the methodology and procedures and modalities that was used in this study. It covers research design, determination and identification of the population, sample size, sampling design, sampling procedure, the instruments of data collection, sources of data, methods of data collection and methods of analyzing the data.

3.2 Research Design

As stated by Bryman and Bell (2007), research design refers to the structure that guides the execution of a research method, and the subsequent analysis of acquired data. It provides a framework for the generation of evidence that is suited both to a certain set of criteria and to the research question in which the investigator is interested. This study adapted the descriptive form of research. Creswell (2002) observes that a descriptive survey is used when data are collected to describe persons, organizations, settings, or phenomena. The study aimed at observing and describing the behavior of the subjects under study without influencing it in any way and therefore considers the descriptive survey to be the most appropriate for this study

3.3 Target Population

The target population for this study was the extension workers of AGRA who are in Nairobi County, Kenya and the extension support staff who work with AGRA. Table 3.1 shows the distribution of the target population:

Target Population

Table 3.1 Indication of the Target Population	
Category	Target Population
Extension Workers	35
Extension Support Personnel	3
Total	38
Table 3.1 Target Population Table	

The respondent in this study was therefore 38 extension workers of AGRA who are in Kenya.

3.4 Methods of Data Collection

A survey was the main tool of data collection in this study.This is a type of research used to obtain data that can help determine specific characteristics of a group. Surveys provide important information for all kinds of research fields. There are several ways of administering survey. The choice between administration modes is influenced by several factors, including costs, coverage of target population, flexibility of asking questions, respondents' willingness to participate and response accuracy. A descriptive survey involves asking questions (often in the form of a questionnaire) of a large group of individuals either by mail, by telephone or in person. When answers to a set of question are solicited in person, the research is called an *Interview*. The main advantage of survey research is that it has the potential to provide us with a lot of information obtained from quite a large sample of individuals.

3.5 Data Collection Instrument

The main research instrument that was used in this study was questionnaires. The research used questionnaire since they are cost effective as compared to other instrument of data collections such as face to face interviews. Another advantage of using a questionnaire is that they are easy to analyze. Further, data collected using a questionnaire is easy to capture and tabulate using many computer software packages. Finally, questionnaires are familiar to most people and nearly everyone has had some experience completing questionnaires and they generally do not make people apprehensive. In developing the questionnaire items, the fixed choice and open-ended

formats of the item was used. This format was used in all categories of the questionnaires. Most of the items adopted a Likert scale (e.g. 1-strongly disagree, 2-disagree, 3-undecided, 4-agree, 5-strongly agree). An interview schedule was used to collect data from the extension workers and the extension support personnel. The researcher was helped by research assistants to collect data. Research assistants were thoroughly trained both in interpretations of responses from respondents and also in the procedure of administration. They then accompanied the researcher in piloting and modifying the research instruments so that they can comprehend fully the purposes and methods of data collection. The research assistants administered the questionnaires personally to the respondents and were the ones entering responses from the respondents in the questionnaire. The researcher however administered the interview schedule on his own. This enabled him gather additional information and interpret answers based on the research objectives. Finally the researcher used literature as a data collection instrument to obtain secondary data.

3.6 Validity of Research Instruments

Validity refers to the degree to which results obtained from analysis of data actually represent the phenomenon under study (Mugenda and Mugenda, 1999).

Content validity was ensured by drafting questions at each section to collect information in different perspectives regarding the objectives and theme of the section. These questions have been validated and used elsewhere, though in a modified format. Respondents were carefully identified.

Internal validity was maximized by collecting filled up questionnaires within 24 hours to prevent alterations of initial responses. The data collection instrument was pre-tested and edited as necessary before actual study. Instructions were simple to follow and responses were in multiple choice format. Research assistants were trained and offered a standard data collection' manual that gave detailed guidelines on their roles during the study. Supervision by the researcher ensured compliance with stated guidelines and universal research protocols.

External validity was upheld by use of randomization of respondent selection method and by control of extraneous variables such as unconsciousness of respondents.

3.7 Reliability of the Research Instrument

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trial (Mugenda and Mugenda, 1999). The researcher carried out a pilot study which was not a part of the actual study. A reliability test was carried out through the test-retest method where the researchers administered the instrument to the subjects for the first time then administer the same instrument to the same subjects after one week. The means score from the two test was correlated using the Pearson product moment correlation coefficient. The instrument was judged reliable since it yielded to a correlation coefficient of 0.7(Gall et al, 1996).

3.8 Data Analysis

The questionnaires were checked for completeness and consistency of information at the end of every field data collection day and before storage. The quantitative data from the completed questionnaires was cleaned, re-coded, classified and tabulated. The researcher used Statistical Package for Social Sciences (SPSS) Version 18 to analyze the quantitative data. The findings of the study were presented in frequency distributions, charts and percentage tables. In addition, the qualitative data was organized in an on-going process according to the themes, sub-themes, categories, sub-categories and was presented in a narrative form.

3.9 Operationalization of Variables

	Objective	**Variables**	**Indicators**	**Measurement**	**Measuring Scale**	**Type of Analysis**	**Tools of Analysis**
1	To establish whether training of extension workers impacts farm productivity.	Independent variable: Type of Training Dependent Variable Farm Productivity	Participation by all the Target Respondents	Frequency of Training Not Trained at All Once in a Year Twice in a Year More than Twice in a Year	Ordinal	Descriptive	Percentage

2	To determine whether the mode of training employed in training extension workers has impact on farming productivity	Independent Variable: Mode of Training Dependent Variable: Farm Productivity	Training Methodologies Applied by the Trainers	Review Methodologies Applied by the Trainers in Training the Agricultural Extension Workers	Nominal	Descriptive	Percentage
3	To establish whether the level of education of extension workers has an impact on farm productivity	Independent Variable: Education Level Dependent Variable: Farm Productivity	Highest Level of Education	Level of Education of Participant Degree and Above Diploma KCSE KCPE Less than Primary Education	Ordinal	Descriptive	Percentage

3.10 Chapter summary

This chapter has presented the research design that was used for this study, the target population, the sampling design, the research instrument to be used, the procedures for data analysis and the operationalization of the variables. The type of research design that was applied in this study was survey study. Collection of data was done through use of questionnaires and both descriptive and inferential statistics were used in the analysis of data collected in this study. Presentation of data also included visual displays such as percentage tables, to provide a complete and accurate impression of distributions and variable relationships. In the next chapter the research results and findings were presented.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter discusses the interpretation and presentation of the findings. The purpose of the study was to establish whether training of extension workers has any influence on the farming productivity. The specific objectives of this study were to determine whether training of extension workers has any influence on farm productivity, to determine whether the mode of training employed in training extension workers has an effect on farming productivity and to determine whether the level of education of extension workers has an influence on farm productivity. This chapter focused on data analysis, interpretation and presentation. The researcher made use of frequency tables and percentages to present data.

4.2 General Information

The Response Rate

The researcher targeted a sample of 38 extension workers of AGRA out of which 37 responses were obtained. This represented a 97.37% response rate. According to Babbie (2002) any response of 50% and above is adequate for analysis thus 97.37% is even better.

As part of their general information the researcher requested the respondents to indicate their gender, age and the duration of time they had been working as extension workers.

Gender of the Respondents

From the findings as shown by Table 4.1, 59.5% of the respondents indicated that they were females while 40.5% were males. This clearly shows that majority of the agricultural extentsion workers in AGRA were female.

As part of their general information, the researcher further requested the respondents to indicate their age.

Table 4. 1 Comparison of gender of respondents		
Gender	Actuals	Percent (%)
Male	15	40.5
Female	22	59.5
Total	37	
Table 4.1 Gender Table		

Age of the Respondents

From the findings as shown by Table 4.2 below, 48.6% of the respondents indicated that they were aged between 25 and 45 years, 24.3% were aged between 45 and 64 years, 13.5% were less than 24 years of age and the same percentage were more than 65 years of age. This shows that majority of the respondents were aged between 24 and 44 years.

In an effort to determine their work experience, the researcher requested the respondents to indicate the duration of time they had been working in AGRA.

Table 4. 2 Assessment of respondents age		
Age Bracket	Actuals	Percent (%)
Less than 24 Yrs	5	13.5
25 - 44 Yrs	18	48.6
45 - 64 Yrs	9	24.3
More than 65 Yrs	5	13.5
Total	37	
Table 4.2 Age Table		

Respondents Work Experience

On their work experience majority of the respondents (48.6%) indicated that they were had worked in AGRA for less than 5 years, 37.8% had worked for between 5 and 10 years and 13.5% had worked for more than 10 years in AGRA. This shows that majority of the respondents had a working experience of less than 5 years as extension workers.

Table 4. 2 Comparison of respondents work experience		
Work experience	Actuals	Percent (%)
Less than 5 years	18	48.6
5-10 years	14	37.8
More than 10 years	5	13.5
Total	37	
Table 4.3 Respondents work experience table		

Farms' productivity

From the findings of the table below, 72.97% of the respondents indicated that farms' productivity had increased after the training of the extension workers, 18.92% indicated they were moderate and 13.51% indicated they had decreased. These findings show that farms' productivity had increased. The respondents further indicated that the volume and quality of produce had increased.

Table 4. 3 Indication of influence on farm productivity		
	Actuals	Percent (%)
Increased	26	72.97
Moderate	7	18.92
Decreased	4	13.51
Total	37	
Table 4.4 Farm Productivity Table		

4.3 Training of Extension Workers

In an effort to determine the effects of training of extension workers on farm productivity, the researcher requested the respondents to indicate their opinion on whether training of extension workers affects farm productivity.

Training of Extension Workers

From the findings of the table 81.1% of the respondents reported that training of extension workers affected farms productivity while 18.9% disagreed. From these findings we can deduce that training of extension workers affects farms productivity.

Further, the respondents indicated that training of extension workers affected farms productivity by increasing volume of produce and quality of produce.

Table 4. 4
Indication of extension workers trained

	Actuals	Percent (%)
Yes	30	81.1
No	7	18.9
Total	37	

Table 4.5 Extension Workers Training Table

Frequency of Training

On how frequent they were receiving training, 45.9% of the respondents reported that it was once in a year, 29.7% indicated twice in a year, 13.5% reported thrice in a year and 10.8% indicated that there was no training. From these findings we can deduce that the extension workers were getting training once in a year.

Table 4. 5
Indication of training frequency

	Frequency	Percent (%)
No Training	4	10.8
Once an Year	17	45.9
Twice an Year	11	29.7
Thrice a Year	5	13.5

Table 4.6 Frequency of Training Table

Usefulness of the Training Received

On the usefulness of the training the extension workers had received, 52.8% of the respondents reported that it was quite usefulness, 33.3% reported that it was very useful and 13.9% resported that it was not useful. From these findings we can deduce that the training the extension workers had received was quite useful.

Table 4. 6
Indication of usefulness of training

Usefulness	Actuals	Percent (%)
Very useful	12	33.3
Quite useful	20	52.8
Not useful	5	13.9
Total	37	

Table 4.7 Usefulness of Training Table

Sources of Information for Agricultural Topics

On the source of information for agricultural topics 32.4% indicated that they got information in conferences, 45.9% got information in seminars, 35.1% got information from other extension workers and 29.7% got information from exposure trips. From these finding we can conclude that the extension workers got their information from conferences, seminars, other extension workers and exposure trips.

Table 4.8
Comparison of various sources of information on agricultural topics

	Yes	No
Conferences	32.4%	67.6%
Seminars	45.9%	54.1%
Other extension workers	35.1%	64.9%
Exposure trips	29.7%	70.3%

Table 4.8 Source of Agricultural Topics Table

4.4 Mode of Training

The study further sought to determine the extent to which extension workers mode of training affected farms productivity.

Mode of Training

According to Table 4.9 below 36.1% of the respondents reported that mode of training affected farms productivity to a great extent, 30.6% indicated to a moderate extent, 22.2% to a very great extent to a low extent. This finding clearly shows that mode of training affects farms productivity to a great extent. Further, the respondents indicated that modes of training determined the response of the farmers to the trainings which

subsequently affected the farms productivity. The researcher further requested the respondents to indicate whether they were satisfied with the mode of training used.

Table 4. 7
Influence of mode of training on farm productivity

	Actuals	Percent (%)
Very Great Extent	8	22.2
Great Extent	13	36.1
Moderate Extent	11	30.6
Low Extent	5	11.1
Total	37	

Table 4.9 Mode of Training Table

Satisfaction with the Mode of Training used

On whether they were satisfied with the mode of training used, 58.3% of the respondents reported that they were satisfied while 41.7% were reported that they were dissatisfied. From these findings we can deduce that majority of the extension workers were satisfied with the mode of training. According to the qualitative information collected, the respondents indicated that the trainers well were knowledgeable in their areas of expertise. In addition, the trainers were able to disseminate their knowledge well. Further, the respondents indicated that the modes of training used were participatory.

Table 4. 8
Indication of Satisfaction with mode of training used

Option	Actuals	Percent (%)
Yes	22	58.3
No	15	41.7
Total	37	

Table 4.10 Satisfaction of Training Mode Table

Modes of Training Used in Training Sessions

Table 4.11 below shows the mode of training used during training sessions. From the findings 62.9% indicated that the mode of training used was participation, 22.9%

indicated that the mode of training used was paternalism and 14.3% indicated that the mode of training used was persuasion. This clearly shows that the mode of training mostly used in training sessions was participation followed by paternalism and persuasion.

Table 4. 9
Mode of training used in training sessions

	Actuals	Percent (%)
Paternalism	8	22.9
Participation	23	62.9
Persuasion	6	14.3
Total	37	

Table 4.11 Mode of training in session Table

4.5 Level of Education

In an effort to determine the effects of level of education of extension workers, the researcher requested the respondents to indicate whether training of extension workers affect farms productivity.

Level of Education

From the findings as shown by Table 4.12, 67.6% of the respondents indicated that mode of training affected farms productivity while 32.4% disagreed. From these findings we can deduce that the level of education affects farms productivity. The highly educated extension workers had more information to offer to farmers unlike the lowly educated. In addition, the qualitative information collected during the informal discussions showed that those extension workers who were more educated were more thorough while disseminating knowledge unlike the low educated. The informal discussion also showed that majority of the farmers preferred being trained by well-educated extension workers than the less educated.

Table 4. 10
Indication of Level of education

Option	Actuals	Percent (%)
Yes	25	67.6

No	12	32.4
Total	37	

Table 4.12 Level of Education Table

Table 4. 11: Trainee Extension Workers

The researcher also requested the respondents to indicate whether they were trainee extension workers. From the findings indicated on Table 4.13 below, 67.6% of the respondents indicated that they were trainee extension workers while 32.4% indicated that they were not trainee extension workers.

Option	**Percent (%)**
Yes	67.6
No	32.4
Total	100

Effects of level of Education of Extension Workers on Farms Productivity

Table 4.14 shows the extent to which the Level of Education of Extension Workers affects Farm Productivity. From the findings 40.5% of the respondents indicated that level of education of extension workers affects farms productivity to a great extent, 24.3% indicated to a very great extent, 21.6% to a moderate extent, 10.8% to a low extent and 2.7% to no extent at all. From these findings we can deduce that level of education of extension workers affects farms productivity to a great extent. Further, the respondents indicated that when the extension workers were highly educated the farmers got better farming techniques which subsequently led to increased volume and quality of produce.

The study also sought to determine the highest level of education of extension workers.

Table 4. 12

Effects of level of education on farm productivity

Extent	Actuals	Percent (%)
Very great extent	9	24.3
Great extent	15	40.5
Moderate extent	8	21.6

Low extent	4	10.8
No extent at all	1	2.7
Total	37	

Table 4.14 Effect of Level of Education on farm productivity Table

Highest Level of Education

From the findings indicated on Table 4.15 below, 32.4% of the respondents indicated that were undergraduates and the same percentage were graduates. 9% of the respondents indicated that they had secondary school education, 13.5% were post graduates while 2.1% had part secondary school education. This clearly shows that majority of the respondents were graduates.

Table 4. 13
Indication of Level of Education

	Actuals	Percent (%)
Partly attended Secondary	1	2.7
Secondary	7	18.9
Undergraduate	12	32.4
Graduate	12	32.4
Postgraduate	5	13.5
Total	37	

Table 4.15 Level of Education Achieved Table

4.6 Correlation Analysis

Correlation Matrix

Table 4.16 below shows the correlation matrix between farms productivity, training of extension workers, mode of training and level of education. According to the findings on the table, there is a positive relationship between farms productivity and training of extension workers, mode of training and level of education of magnitude 0.5137, 0.4106 and 0.4254 respectively. This means that having extension workers trained has a positive influence on farm productivity. The findings also indicate that the mode of training offered increases farm productivity. Moreover, having extension workers with a high level of education increases farm productivity.

Table 4. 14

Correlation Analysis Of Variables

	Farms productivity	Training of extension workers	Mode of training	Level of education
Farms Productivity	1.0000			
Training of Extension Workers	0.5137	1.0000		
Mode of Training	0.4106	0.3107	1.0000	
Level of Education	0.4254	0.3271	0.3288	1.0000

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the discussion of key data findings, conclusion drawn from the findings highlighted and recommendation made there-to. The conclusions and recommendations drawn were focused on addressing the purpose of this study which was to establish whether training of extension workers has any impact on the farming productivity. The specific objectives of this study were to determine whether training of extension workers influences farm productivity, to determine whether the mode of training employed in training extension workers has influence on farming productivity and to determine whether the level of education of extension workers has an influence on farm productivity.

5.2 Summary of the Findings

The study established that majority of the respondents interviewed had worked in AGRA for less than 5 years. This showed that most of the respondents had a work experience of less tan5 years with AGRA. Further, the study established that farm productivity had increased after the training of extension workers. In addition, according to most of the respondents they expressed that training of extension workers affected some productivity. Moreover, according to study the impact of training extension workers affected farm productivity positively.

The study found that majority of respondents received the training extension once per year, and another significant proportion of respondents said that they received the training twice in a year. On the usefulness of the training the extension workers, had received, majority of the respondents reported that it was quite useful. Further, on the source of information for agricultural topics, most of the respondents indicated that they got the information from the seminars and another significant proportion received the information from information centers.

Finally, according to majority of the respondent's reported that the mode of training affected farm productivity. Also the respondents indicated that the mode of training determined the response of the farmers to the training which subsequently affected farm productivity. On whether they were satisfied with the mode of training used most of the respondents reported that they were satisfied. However, a significant proportion of the respondents said that they were not satisfied. Based on the qualitative information collected, the respondents indicated that the trainers were well knowledgeable in their areas of expertise in addition the trainers were able to designate their knowledge well.

5.3 Discussions of Key Findings

The targeted population was 38 extension workers of AGRA out of which 37 responses were obtained. According to Babbie (2002) any response of 50% and above is adequate for analysis thus a 97.37% response rate is even better. This study deduced that majority of the agricultural extension workers in AGRA were female aged between 24 and 44 years. The study also found that majority of the respondents had a working experience of less than 5 years as extension workers.

5.3.1 Training of extension workers

This study found that training of extension workers affects farms productivity to a great extent. On the frequency of getting training the study found that the extension workers were getting training once in a year. The study also established that the training the extension workers had received was quite useful. According to Birkhaeuser et al. (1991) an agricultural extension workers is expected to perform the following functions: to help farmers improve their living standards; help farmers achieve their long and short term objectives; make practical suggestions which will enable farmers to attain their goals; act as a link between farmers, researchers and planners; help farmers to devise methods of overcoming their problems. An extension worker cannot achieve these objectives unless he/she undergoes training sessions.

On the source of information for agricultural topics the study revealed that the extension workers got their information from conferences, seminars, other extension workers and exposure trips.

5.3.2 Mode of training

The study further sought to determine the extent to which extension workers mode of training affected farms productivity. From the findings the study found that mode of training affects farms productivity to a great extent.

It was also realized that majority of the extension workers were satisfied with the mode of training used. The mode of training mostly used to train extension workers in training sessions was participation followed by paternalism and persuasion. According to Gautam and Madhur (1998) the transmission model of training is closely related to the idea that extension workers are the link (i.e. message carriers) between extension workers (senders) and farmers (receivers). Extension programmes based on this model has been described as "paternalistic". The actors in the communication process have a parent/child or teacher/student relationship (top-down approach). The findings of this study relate with findings by Gautam and Madhur (1998) who argue that paternalistic extension is gradually being replaced by more participatory approaches in which the knowledge and opinions of farmers is considered to be just as important as that of researchers or government officials. Participatory approaches involve information-sharing and joint decision-making. The terms "interactive" and "bottom-up" have been used to describe these approaches.

5.3.3 Level of education

On the effects of the level of education of extension workers on farms productivity, the study found that the level of education affects farms productivity. These findings correlate with findings by Appleton and Arsene, (1996) that the work of universities and training institutes in particular has a significant impact on extension organizations. The study also found that majority of the extension workers in AGRA were trainee extension workers. The study further revealed that level of education of extension workers affects farms productivity to a great extent. On their highest level of education the study found that majority of the respondents were graduates followed by undergraduates. According to Appleton and Arsene, (1996) it is not unusual for extension organizations to have posts that are either vacant or filled by under qualified personnel. This study found that AGRA had employed secondary school leavers as extension workers. Inadequate

numbers and qualifications of staff remain a difficult problem for public sector extension organizations.

5.4 Conclusions of the study

This study concludes that training of extension workers affects farms productivity to a great extent. On the frequency of getting training the study concludes that the extension workers were getting training once in a year and the training the received was quite useful. The extension workers got their information from conferences, seminars, other extension workers and exposure trips.

The study further concludes that mode of training of extension workers affects farms productivity to a great extent. It was also realized that majority of the extension workers were satisfied with the mode of training used. The mode of training mostly used to train extension workers in training sessions was participation followed by paternalism and persuasion.

On the effects of the level of education of extension workers on farms productivity, the study concludes that the level of education affects farms productivity to a great extent. The study also concludes that majority of the extension workers in AGRA were trainee extension workers. On their highest level of education the study concludes that majority of the respondents were graduates.

5.5 Recommendations of the study

This study found that training of extension workers affects farms productivity to a great extent. However, the study further found that extension workers were getting training once in a year. This research study therefore recommends that AGRA should increase the frequency of training of the extension workers so as to equip them with information useful to the farmers which can subsequently lead to increase their farms productivity.

The study also found that the extension workers were getting agricultural information from conferences, seminars, other extension workers and exposure trips. This study therefore recommends that extension workers should also seek more information from agricultural extension programs through their websites.

The study found that the level of education of extension workers affects farms productivity to a great extent. However, they study revealed that some of the extension workers had secondary school education. This study therefore recommends that AGRA should recruit qualified extension workers.

5.6 Recommendation for Further Research

From the study and related conclusions, the researcher recommends further research in the area of training extension workers on farm productivity. The study also recommends further research studies in the area of challenges facing agricultural extension workers in Nairobi County.

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APPENDICES

APPENDIX I – LETTER TO THE RESEARCH PARTICIPANTS

This is the letter of research sent to participants before collecting the data via the questionnaire.

Angela Maina,
P. O Box 51572-00200,
Nairobi, Kenya

I, Angela Muthoni Maina, have registered with the University of Nairobi for the Master of Arts Degree in Project Planning and Management (MA). I am conducting a research study on the effects of training extension workers on farm productivity in Kenya. I am requesting your voluntary participation in this research study.

Your opinions and experiences are very important in this study, and you need to give an accurate picture, to enable me, the researcher, to find out what factors contribute to farm productivity. Participation in this study is voluntary. You can withdraw from the study at any stage if you do not feel like continuing, even after you have consented to participate in the study. Anonymity is key in answering the questions. Kindly do not write your name on the questionnaire, or anything that can identify you in any way. Nobody except the researcher and a statistician will see your questionnaire once it has been completed.

It should take you approximately thirty (30) minutes to complete the enclosed questionnaire.

For any enquiries, please find my address above. Please place the questionnaire in the envelope provided, and seal the envelope before handing it in.

Thank you very much for your cooperation and assistance in this endeavor.
Yours Faithfully,

Angela Muthoni Muriuki.

APPENDIX I I – QUESTIONNAIRE FOR EXTENSION WORKERS, AGRA-NAIROBI COUNTY

This is the research instrument used to conduct the research study.

A. General Information

<table>
<tr><td>1</td><td colspan="2">Enumerator.....……..... Date.....</td><td>Office use only

1.1 □</td></tr>
<tr><td>2</td><td>2.1 Sex of respondent:

Male □ 1
Female □ 2</td><td>2.2 Age of respondent:

≤ 24 □ 1
25-44 □ 2
45-64 □ 3
>65 □ 4</td><td>2.1 □
2.2 □</td></tr>
<tr><td></td><td colspan="2">3.4 How long have you been working as an extension worker?
< 5 years □ 1
5 – 10 years □ 2
> 10 years □ 3</td><td>3.4 □</td></tr>
<tr><td></td><td colspan="2">3.5 How do you rate farms' productivity after the training of the extension workers?
Increased □ 1
Moderate □ 2
Decreased □ 3</td><td>3.5 □</td></tr>
</table>

B. Training of Extension Workers

<table>
<tr><td rowspan="2">7.</td><td>7.1 does training or extension workers affect farm productivity?
yes □
No □</td><td>7.2 How frequent do you get training?
No training □
Once an year □
Twice an year □
3 times an year □</td><td>7.1 □
7.2 □</td></tr>
<tr><td colspan="2">7.3 How did you find the training you received?
Not useful □ 1
Quite useful □ 2
Very useful □ 3</td><td>7.3 □</td></tr>
<tr><td>7.4</td><td colspan="2">10.1 What are your sources of information for agricultural topics?

1. conferences □
2. seminars □
other extension workers □
4. Exposure trip □</td><td>7.4 □</td></tr>
</table>

C. Mode of Training

8.		
	8.1 To what extent does extension workers mode of training affect farm productivity? Very great extent □ Great extent □ Moderate extent □ Low extent □ extent at all □	8.1□
	8.2 Are you satisfied with the mode of training used? Yes □ No □	8.2 □
	8.3 Which of the following modes of training is used during your training sessions? Paternalism □ 1 participation □ 2 Persuasion □ 3	8.3 □

D. Level of Education

9 .	9.1 Are you a trained extension worker? Yes □ No □	9.1 □
	9.2 To what extent does the level of education of extension workers affect farms productivity? Very great extent □ Great extent □ Moderate extent □ Low extent □ No extent at all □	9.2 □
10 11	What is your highest level of education? No school □ primary □ Partly attended Secondary □ Secondary *(matriculated)*□ Secondary □ Undergraduate □ Graduate □ Postgraduate How would you rate the farm productivity in the past one years Improved □ Stagnant □ Deteriorated □	10 □

INTERVIEW SCHEDULE

Thursday, September 8, 2011	**Location**	**Participants**
9:30 – 10:30 a.m.	AGRA, Nairobi County- 2nd floor	Breakfast with Head and deputy extension workers
10:30 – 11:00 a.m.		Travel to 2nd floor conference room
11:15 – 1:15 p.m.	AGRA, 2nd floor conference room	Extension program Coordinators, Head of grantees, Project Officers
Friday, September 9, 2011	**Location**	**Participants**
9:30– 10.30.am.	AGRA, Nairobi County- 5th floor	Breakfast with Senior extension officers
10:45 – 11:15 a.m.		Travel to 5th floor conference room
11:30 – 1:30 p.m.	AGRA, 5th floor conference room	Extension Program officers, Associate Extension Consultants
1:45 – 2:45 p.m.	AGRA, 5th floor conference room	Lunch with Agricultural Research Service