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# Assessment of the factors impacting agricultural extension training programs in Tanzania: a descriptive study

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**Assessment of the factors impacting agricultural extension training  
programs in Tanzania: A descriptive study**

by

**Alunas Maxwell Mwamakimbula**

A thesis submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of  
MASTER OF SCIENCE

Major: Agricultural Education (Agricultural Extension Education)

Program of Study Committee:  
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Iowa State University

Ames, Iowa

2014

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**DEDICATION**

This work is dedicated to my whole family  
for their love and support throughout my schooling time.

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## ABSTRACT

Many studies conducted on extension have identified problems and the failure of various approaches that are meant to help farmers in agricultural advancement. This study was designed to obtain the ideas of the main clientele group in the extension sector and that is, of course, farmers. Farmers probably make up the largest Extension clientele group in many African countries. This study aimed to identify the perceptions that farmers have of extension services in Kilolo district, Tanzania. In addition, the study sought to identify farmers' preferences of the extension approaches used and to identify factors that motivated their participation in extension training. This study was based on input from 120 interviewed participants in the Kilolo district of Iringa region. A researcher developed interview schedule was used to collect the data.

According to this study, most farmers are motivated to attend extension education training to learn new ways of doing things in order to improve production, and farmers prefer to learn by doing through demonstration. Despite the eagerness that farmers have for learning new ways of farming, most farmers are discouraged with the poor organization and coordination of extension training programs in their areas. Most farmers know the importance of extension services in improving their production, but they are not satisfied with the way these services are being implemented. The other factor that the study identified is the lack of a participatory approach among extension agents, which leads to the inability to meet farmers' needs.

Additionally, the study found that poor support by the government for the extension sector also lowers the effectiveness of the extension agent. In most cases, extension agents live far from their assigned villages due to lack of housing. There is also a lack of transport

for extension agents, which seems to be another reason for not helping farmers in their workstations.

## **CHAPTER 1. INTRODUCTION**

### **Background and Setting**

Almost all countries in the world deliver some type of extension service to help rural people advance their agricultural productivity and improve their living standard (Wambura, Acker, & Mwasyete, 2012). Extension is responsible for serving about one billion small-scale farmers in the world (Davis et al., 2010). The improvement of agricultural sciences and technology has brought about dramatic changes in the agricultural sector (Nagel, 1997). This has led to the increased need and opportunity for investigating the effectiveness of agricultural extension services in various parts of the world. Also, this situation stimulates the need for new approaches to promote the transition of new innovations into concrete benefits to poor farmers in developing countries (Hellin, 2012). East Africa is among the places with the largest extension system in Africa (Moris, 1991), and studies have indicated that the agriculture sector in this part of Africa has not shown significant improvement in production and bettering peoples' lives in rural areas (Kasie et al., 2012; Kyaruzi, Mlozi, & Busindi, 2010; Wambura et al., 2012).

In Tanzania, there are still no substantial improvements in agricultural and livestock production among small-scale farmers despite extension decentralization efforts made to ensure that extension services are available to many farmers (Kyaruzi, et al., 2010). Tanzania suffers from low agricultural productivity due to a number of factors including an inadequate extension system leading to ineffective dissemination of technologies, poor market linkages, weak links between research and extension, and inadequate government support (Ministry of Agriculture Food Security and Cooperatives [MAFC], 2007; Churi, Mlozi, Tumbo, & Casmir, 2012; Mattee, 1994; Mvuna, 2010; Wambura et al., 2012).

Other issues affecting efficiency of the extension system include poor organizational structure, poor administrative and institutional structure, lack of clientele involvement in the planning process, and untimely provision of extension services (Campbell, 1999; Rutatora & Mattee, 2000; Swanson & Samy, 2003). Research has been conducted to address these issues (Abdullah & Samah, 2013; Anderson, Feder, & Ganguly, 2006; Campbell, 1999; Mattee, 1994; Qamar, 2005; Rutatora & Mattee, 2001), but there is insufficient research on the role of the clients (farmers) in the effectiveness of the extension system. In his study, Swanson (2006) pointed out that the “Farmer Advisory Committees (FACs) have been successfully used to ensure full stakeholder involvement in program planning and to increase farmers’ accountability” (p. 14).

“Tanzania’s economy relies heavily on agriculture, which accounts for nearly half of the GDP and employs about 80% of the workforce” (Oreku, Mtenzi, & Ali, 2013, p. 264). There is a need to strengthen the extension services by incorporating ideas of small-scale farmers who dominate this sector in Tanzania (Nkonya, Schroeder, & Norman, 1997).

Abdullah and Samah (2013) pointed out that weak perception of technology, low education of farmers, disorganization, and limited knowledge among extension workers are some of the factors that affect the success of extension trainings. Because extension deals with people (Moris, 1991), there is a need to understand these people’s perceptions about what extension programs deliver to them. As stated by Moris (1991), “clients must desire the activities which an extension agent promotes” (p. 117). Therefore, there is a need to know the extent to which farmers want the agricultural educational activities in their areas. Gautam (2000) further pointed out that the levels at which farmers adopt agent recommendations are very low.

Qamar (2005) stated that “The unhealthy perception of extension prevails in many developing countries, as a result of a weak extension lobby, imperfect initial organizational set-up, an inherent lack of trust in extension by most of the research organizations, and traditionally poor career development conditions in the profession of extension.” (p. 7)

The role of extension is to empower farmers and enable them to identify and analyze their agricultural problems so they are able to make correct decisions (Kimaro, Mukandiwa, & Mario, 2010). This justifies the importance of understanding the perceptions of the clients served so that the clients can be effectively involved in extension program planning and promote their ability to adopt the technologies delivered. “The role of farmers’ preferences in adoption decisions has received very limited attention in adoption studies conducted” (Adesina & Baidu-Forson, 1995, p. 2). Furthermore, studies have shown that the efficiency of agricultural extension activities depends substantially on the attributes of farmers receiving the information (Atsan, Isik, Yavuz, & Yurttas, 2009). Karbasioun, Mulder, and Biemans (2007) pointed out that “little information exists about perceptions of farmers on extension courses and instructors” (p. 80). Moreover, the importance of this study relies on the fact that farmers’ perceptions of technologies and knowledge delivered through extension education programs can be used in explaining farmers’ adoption decisions (Adesina & Baidu-Forson, 1995). Therefore, the problem statement for this study is: How does a farmer’s perception regarding extension education programs affect his or her participation in these programs in the Kilolo district?

### **Need for the Study**

The current poor performance of the agricultural extension system is a result of inadequate resources to enable it to perform its role effectively. But perhaps a more important factor is its bureaucratic organization, which tends to contradict its very mission of

working closely with farmers and with other service agencies to stimulate agricultural modernization. (Mattee, 1994, p. 185)

Boone, Gartin, Wright, Lawrence, and Odell (2002) insisted on the importance of improved agricultural extension in the 21<sup>st</sup> century given that the agricultural sector is facing many technological advances, new agricultural laws, and innovative marketing strategies, all of which need to be communicated to farmers through well-established extension education programs. This calls for the need to study all aspects related to extension, including the main stakeholders (farmers), in looking for better means of improving the extension education programs. Campbell (1999) argued that there is a need to create an organizational structure that will ensure effective individual interaction, both formal and informal, for the best achievement of extension's goals. Therefore, the current study aimed to identify farmers' perceptions and how those perceptions impact the farmers' involvement in extension education programs in Tanzania.

As stated by Leonard (1997), "the satisfaction of human beings in their social associations depends on the expectations they bring to them as well as on the actual benefit they receive in them" (p. 89). Thus, the current study aimed to identify farmers' level of satisfaction in extension education programs to help in the modification of the extension programs to satisfy farmers' preferences. Christoplos and Farrington (2004) pointed out, "Much is said about the importance of involving farmers in extension education programs, but such involvement is often a token gesture" (p. 80). Therefore, there is a need to understand farmers' perceptions in order to find better means of helping them effectively participate in the extension education programs by developing programs and use of methods that meet their needs.

### **Purpose and Objectives**

The main purpose of this research was to assess the general perceptions of Kilolo district farmers regarding extension training programs. The specific objectives for this study were to:

1. Identify farmers' general perceptions about agricultural extension training programs,
2. Identify the extent to which farmers participate in agricultural extension education training programs,
3. Identify preferred methods for delivering agricultural extension training programs,
4. Identify factors that influence farmer participation in agricultural extension education training programs, and
5. Identify selected demographic data and analyze the comparisons among variables.

### **Significance of the Study**

This study aimed to identify the way the target group perceived the extension services. Knowing this, extension service providers can be aware of what best can be done to meet target group needs and foster advancement of the agricultural sector by encouraging more farmers to participate in extension training and adopt the given technologies. It will help in planning extension programs by incorporating ideas that will foster positive perceptions of extension among farmers regarding recommendations that are given. As stated by Oladele (2005), "farmers' receptivity to training largely depends on the use of several educational methods by extension agents to reach farmers" (p. 223). Therefore, this study helped to identify farmers' most preferred methods so as to improve their receptivity of extension education programs and, hence, their success and eventual improvement of agricultural production.

The effectiveness of agricultural extension activities depends substantially on the attributes of farmers receiving and using the information (Atsan et al., 2009). From this study, knowing farmers' perceptions of extension training will help greatly in modifying the information that extension offers in order to fit farmers' needs. The results of this study can help to make the information delivered more meaningful and more accepted by farmers. Karbasioun et al. (2007) indicated, "Little information exists about perceptions of farmers on extension courses and instructors" (p. 80). This comment shows why this study is significant for the development of the agricultural sector in Tanzania.

The findings of this study will help in improving the competence profiles of extension agents based on farmers' attitudes and expectations. Karbasioun et al. (2007) pointed out that understanding the characteristics of a target group (farmers) has a lot to do with improving competency profiles for extension agents as professionals. This is because extension workers need to be equipped with specific techniques to help specific groups of people based on their characteristics and identified needs.

### **Definitions of Terms**

*Agricultural extension*: the exchange of knowledge with the aim of helping rural families to develop skills needed to solve their immediate problems and improve their lives (Ensminger & Sanders, 1945, as cited in Seevers and Graham, 2012; Nagel, 1997)

*Tanzania extension agent*: a professional employee of the ministry of agricultural food security and cooperative including ward-, village-, and district-based staff.

*Extension delivery methods*: techniques used by extension agents in teaching the target group; can be classified by contact as individual, group, and mass methods (Seevers & Graham, 2012)



*Region:* an administrative area in the country, which is then divided into districts for administrative purposes.

*Ward:* the lowest government administrative structure at the community level, usually representing between 1,000 and 21,000 people.

*Village:* a small subdivision of a ward for management purposes in rural areas.

*Perception:* “the process by which individuals receive information or stimuli for the environment and transform it into psychological awareness” (Van den Ban & Hawkins, 1996, p. 282) and the process that encompasses the senses and enables a person to reach at true beliefs about their environment (Coats, 1998). In this research this term is defined as the beliefs of farmers regarding extension-training programs.

*Organization structure:* the hierarchical arrangement of authority and distribution of responsibility for decision-making in the organization showing trends of communication and duties among various staff. It determines flow of information between different levels of management.

*Motivation factor:* something that inspires someone to do something. In this study this will be things that encourage farmers to participate/attend extension trainings.

*Innovation:* an idea or practice that is perceived as new to the clientele (SeEVERS & Graham, 2012). As used in this study, innovation represents the new research-based ideas and practices in agricultural production presented through extension programs.

*Farmer field school (FFS):* this is an adult education approach in which farmers learn in an informal setting within their own environment (Davis et al., 2010). FFS are also referred to as “schools without walls” where groups of farmers meet under the

guidance of facilitators, normally it includes the group of 20 to 25 farmers (Mvuna, 2010).

*Adoption*: the decision to accept or to make use of the new ideas or practice as the best course of action (Seevers & Graham, 2012). For this study, adoption will be used as the ability to make use of the technologies delivered through extension training.

### **Chapter Summary**

Ison and Russell (2000) defined extension as “the process of extending knowledge from a center of a learning to those in need of this knowledge” (p. 19). This chapter elaborated on the importance of extension in fulfilling this role and some factors hindering its success. Agricultural extension education programs have the core role of helping farmers utilize the potential they have for agricultural improvement in Tanzania. This chapter gave an overview of the agricultural situation in Tanzania, its problems, and the extension system. This chapter stated the importance of this study for the improvement of extension education programs and, hence, the improvement of peoples’ lives through improved agricultural production. The chapter also defined some terms that are used throughout the document.

## **CHAPTER 2. REVIEW OF LITERATURE**

### **Introduction**

Agricultural extension is a component of agricultural education mostly known for serving rural farmers. Many scholars have conducted studies on various aspects related to agricultural extension.

This chapter provides an overview of various aspects of extension education programs as related to the purpose of this study. The literature review is based on farmers' perceptions of extension, research, and roles of extension education programs in Tanzania and the world at large. Also, this chapter describes extension delivery methods as well as factors that affect extension education programs in developing countries like Tanzania.

### **Agricultural Extension Services in Tanzania**

It is estimated that crop and livestock production started about 10,000 years ago, (Jain, 2010). Throughout this period, farmers have adopted various technologies, tested them, and shared them with other members in the community. The communication process has taken the form of verbal explanation and practical demonstrations.

In Tanzania, agricultural extension services are provided mainly through the Ministry of Agriculture Food Security and Cooperatives (MAFC) (Mvuna, 2010). The ministry also provides room for private sectors to participate in improving the provision of agricultural services to farmers. In the meantime, the public sector puts more emphasis on policy formulation, financial provision, and regulation of the provision of public goods and services (Mvuna, 2010). One of the most effective ways to strengthen the extension services provided by the MAFC is to bring about ownership of the extension service by farmers and make extension workers more accountable. This will be achieved if, and only if, farmers have a positive perception and appreciate the significance of the extension services. The ministry

has been restructured to create small manageable organizations, which will be more efficient and responsive to farmers' problems and needs (Rutatora & Mattee, 2001).

Farmers' participation has been a concern for many projects. Rutatora and Mattee (2001) mentioned that one of the aims of the National Agricultural Extension Project Phase II was to initiate farmers' participation in agricultural extension. This project was funded by the World Bank with the aim of improving the delivery of extension services to smallholder farmers. To create a "demand driven" national agriculture extension system, farmer involvement through formal mechanisms and informal consultations in policy formulation and periodic review has to be done (John, Rajan, Sharma, Singh, & Arora, 1997, p. 65). In this regard, farmers with a clear understanding of extension services are more likely to bring about the successful use of the extension system, which will effectively address farmers' needs. As pointed out by Mattee (1994), an effective extension system should identify farmer needs and problems and determine the best solutions. According to the MAFC (2007), Tanzania is suffering from low agricultural productivity due to a number of factors including an inadequate extension system, poor linkage between extension and research, and climatic changes.

### **Farmers' Perceptions of Extension Education Programs**

Among other factors that impede the agricultural sector in many developing countries is the lack of feedback from farmers to ensure relevance of the research results presented (Idachaba, 1987, as cited in Peterson, 1995; Oram & Bindlish, 1984, as cited in Peterson, 1995). Based on Moris (1991), agricultural extension is defined as:

the promotion of any aspect of technology development: how people acquire the necessary resources, how new technologies are evolved, what influences their choice,

the kind of support a given technology requires, how its adoption can be financed and encouraged and the kind of protection it entails. (p. 12)

This definition relates to the existing needs for further research in extension so as to meet its role in the society. For instance, it is important to study farmers' perceptions so as to be able to know what influences them to attend training and the types of lessons they like to learn about and, in this regard, will provide the opportunity to have them adopt the taught technologies.

Sarker and Itohara (2009) studied the perceptions of farmers regarding organic agriculture as well as their attitudes toward extension workers. The sample included organic farmers involved in a given program (OAE-PROASHIKA). In their study, it was found that the program gives priority only to credit issues, technical information, and helping farmers in marketing their organic produce. However, training on effective use of natural resources and the effective supply of organic inputs has been found to have a greater impact on improving the livelihood of small-scale farmers. Such studies need to be expanded and conducted with a greater number of farmers for the development of the agricultural sector in most developing countries like Tanzania. Sarker and Itohara's (2009) research indicated that extension would be more effective in helping to improve farmers' livelihoods if there was a clear understanding of what farmers want to know and how they want it to be delivered to them.

Alonge (2005) studied the perceptions of extension personnel. He identified factors that affected the extension services in many developing countries as being staffed with ill-trained and ill-equipped village extension workers and working in unfavorable environments. Poor resource farmers have access to only the village extension worker. The current study tried to connect the farmers' perceptions to what extension agents deliver to them.

Yurttaş and Atsan (2006) pointed out that most agricultural extension training activities are based on voluntary participation. Therefore, in order to have farmers voluntarily participate in extension training, their needs and preferences have to be addressed. Different groups of farmers have varying needs for extension training. For instance, the study by Yurttaş and Atsan revealed that farmers' need for extension services differ based on age, number of cattle owned, and educational level. Furthermore, a study by Gautam (2000) revealed that "some farmers indicated that they do not want any extension advice and some do not want the current service to continue" (p. 33).

### **Role of Extension in Developing Countries**

"Agricultural education is becoming increasingly important in countries which depend heavily on agriculture for both the living of the majority of their population and their export earnings" (Oladele, 2005, p. 224). Tanzania is among such countries given that about 80 percent of the population depends on agriculture for a living (Oreku et al., 2013).

Mattee (1994) pointed out that "it is truism to state that the effective transmission of research findings to farmers is essential if research efforts are to contribute to agricultural progress" (p. 177). He added that this requires an effective agricultural extension system that links effectively with research and works very closely with farmers. Maunder (1972, as cited in Wambura et al., 2012) mentioned that the factors that push the advancement of agricultural extension in developing countries were: (a) threat of famine, which forces governments to take measures to improve food production; (b) social unrest among rural people has made it politically imperative to give assistance in bettering their levels of living; (c) newly independent countries have found that agricultural modernization is a first step toward economic development and freedom from economic dependence on more powerful and advanced nations; and (d) a recognition that rural people, who constitute the majority of the

population in most countries, have a right to equity for an advanced and better life. These factors provide the necessity to understand the needs of the farmers and develop means that will facilitate their participation and adoption of new and approved practices. A study by Asfaw, Kassie, Simtowe, and Lipper (2012) revealed that nonadopters are more likely to be constrained by less contact with extension agents.

The main role of extension is to empower farmers and enable them to identify and analyze their agricultural problems and be able to make the right decisions (Kimaro et al., 2010). Jain (2010) pointed out that the central task of extension is to assist rural families to be able to help themselves through application of science to their daily life of farming and home-making and that it uses communication of valuable information, which helps people make sound decisions. Given the importance of the agricultural sector in Tanzania, the main source of food and industrial raw materials, there is a great need to improve the performance of the extension sector so as to increase productivity and improve peoples' well being and national income.

The extension program content may comprise a particular crop or all crops, livestock, forestry, or fisheries, singly or in some combination. The coverage may include a variety subject matter such as crop production, marketing, economic and management aspects, and family and youth development programs (SeEVERS & Graham, 2012). The clientele addressed may be all men and women, adults, and young farmers (Gaaya, 1994).

Historically, public extension has been an important source for agricultural information in rural areas (Gautam, 2000). Also, extension plays a big role in improving production efficiency by promoting technological changes among farmers. There is a need to develop a new vision of agricultural extension and view it as the core in serving the public

for food security given the increased external forces such as globalization (Jain, 2010). Economic development is based mainly on production, marketing, and micro-enterprise development of poor rural people (Qamar & Rivera, 2003). This suggests why extension is very important, as there is a great need to help rural farmers cope with the prevailing situation in the world, in terms of technology as well as market demands. In addition, strengthening agricultural extension without understanding farmers' needs and their views on extension will not help. This is because, for extension programs to succeed, farmers must participate effectively in and understand the significance of the programs. In this way, they will easily adopt the information delivered and, hence, improve productivity and income (Karbasiun, Mulder, & Biemans, 2007). There are many development potentials for the agricultural sector, but the agricultural education system "has not kept pace with the changing conditions of society" (Bagchee, 1994, as cited in Oladele, 2005, p .224).

The growth of rural development activities leads to the expansion of technology transfer, input supply and coordination, and credit delivery or supervision (Purcell & Anderson, 1997). Gautam (2000) stated that the design of the institutional structure should focus on the ability to empower farmers. The system should find means of giving farmers the ability to state their views regarding extension programs.

Gautam (2000, p. 23) pointed out that the indicator for a successful extension program is the farmers' awareness and adoption of the technological components delivered through extension, as this provides the framework for assessing potential economic impact. Mvuna (2010) also argued that "extension services are crucial in enabling producers to realize the increased production and productivity in accessing information for marketing and



the other support services essential for agricultural development towards poverty reduction and overall development” (p. 116).

### **Extension Delivery Method Preferences**

There are various means used by extension agents for delivering information to farmers. Extension is the process of getting farmers to do what they would otherwise disregard (Moris, 1991). In this regard, prior preparation and proper selection of the delivery methods must be done so as to achieve this aim of extension. As stated by John et al. (1997), there is no one extension approach suitable for all situations, objectives, or clientele.

Most of the extension programs focus on adult farmers. Characteristics of adult learners, as outlined by Knowles (1980) include: (a) they are mature, independent, and self-directed; (b) they have a reservoir of experience that can be resourceful for learning; (c) their readiness to learn is related to the developmental task of their social role; and (d) they prefer to learn things that will be applied immediately in their daily life. In delivering extension training, these traits have to be taken into account so as to encourage active participation among learners (farmers) and improve the adoption rate. Research has shown that, for effective adult training, providers (extension agents) have to ensure that farmers get something to take home with them (Dollisso & Martin, 1999, p. 45). The commonly used extension approaches in Tanzania include the training and visit system, contract farming, farmer-to-farmer extension, farmer field schools, farming systems approaches, and participatory extension (Mvuna, 2010).

### **Farmer Field Schools**

The farmer field approach focuses on participatory adult learning methods that facilitate a group of farmers to acquire and apply appropriate agricultural practices. It relies on hands-on activities, and it encompasses 20–25 farmers per class. Mvuna (2010) estimated

that there is about 6,711 farmer field schools in Tanzania at that time. Research conducted by Davis et al. (2010) in Tanzania indicated that poor farmers are good participants in farmer field schools. Farmers who are better off do not participate as they view it as the waste of time. The advantage of this method is that, through group interactive activities, farmers get a chance to improve their decision-making capacity as well as their leadership and communication skills. The current study revealed how farmers in the study area perceived extension.

### **Training and Visit**

The training and visit system is characterized by professionalism, a single line of command, concentration of efforts, time-bound trends, field and farmer orientation, regular and continuous training, and linkage with research (Benor, Harrison, & Baxter, 1984; Douglah & Sicilima, 1997; Rutatora & Mattee, 2001). The training and visit system was first introduced in Tanzania in 1986 with the assistance of the World Bank as part of the National Agricultural and Extension Rehabilitation Program (Douglah & Sicilima, 1997). This system requires “regular and tight supervision of field staff through regular field visits, periodic training at the district and a single line of command” (Mattee, 1994, p. 184). This system has been criticized in Tanzania due to the fact that there has been insufficient research to sustain periodic farm visits. Also, weak infrastructure and poor working tools have led to the failure of training and visit sessions in many African countries (Anderson et al., 2006; Moris, 1991).

### **Farmer-to-Farmer Extension**

Farmer-to-farmer extension is an extension approach in which farmers are trained so that they can train other farmers under the “training of trainers” approach. This approach helps to ensure the availability of locally based experts in the communities. An effort has

been made in Tanzania to train farmers who can train others in their respective communities. This model is in use in some regions; about 930 farmers have been trained to train others, and about 69,750 farmers are getting agricultural knowledge through this method (Mvuna, 2010).

### **Contract Farming Approach**

This approach is not well known as an extension approach but is used as a commercial arrangement between farmers and agricultural industries for economic interests.

### **Farmers' Access to Agricultural Information**

The public extension service is the main source of information about agricultural activities (Gautam, 2000). Churi et al. (2012) mentioned radio, village meetings, and extension meetings as sources from which farmers obtain information about market issues, agricultural technologies, and climate forecasts. Furthermore, Gautam (2000) stated that hearing agricultural information on the radio helps encourage farmers to look for more detailed information that will convince them to pay for some agricultural extension services. "Communication and sharing of knowledge from farmer to farmer has remained to be the main methods despite of the inadequate reliability of information and experience shared among them" (Churi et al., 2012, p. 838). Also, some farmers use cellphones to share their indigenous knowledge of agricultural production with others (Churi et al., 2012; Lwoga, Ngulube, & Stilwell, 2010). Churi et al. (2012) argued that the use of cellphones in rural areas in Tanzania has increased in spite of the low level of income among farmers; this has been facilitated mainly by the decrease in prices for mobile services and increased network coverage.

### **Factors Affecting Extension Education Programs in Developing Countries**

The extension education system for training farmers is provided in many African countries, but it has had little impact in the home villages of the farmers (Roberts, 1989).

Moris (1991) pointed out that a lower salary level and fewer resources for field extension agents as compared to those at the “headquarters” represent the major factors that lower the effectiveness and efficiency of extension systems in most developing countries. The other problem mentioned by Moris in the ministry-operated extension service is the financing needed for working facilities, such as vehicles and inputs needed for effective extension operations. Benor et al. (1984) also criticized the ministry-based extension system in that it is too bureaucratic and extension agents have no authority to change the definition of their duties. This is also a common problem in Tanzania as a large part of extension services are conducted through the Ministry of Agriculture Food Security and Cooperatives (MAFC). Churi et al. (2012) pointed out that a “limited number of extension workers in relation to the number of farmers, lack of funds for supporting farmer field schools and farmers demonstration plots constrain flow of information reaching farmers in Tanzania” (p. 838).

An observation from the implementation of the Agricultural and Livestock Extension, Rehabilitation Project–Tanzania, which was based on the training and visit system, shows that extension and government staff have not paid enough attention to participatory approaches (Rutatora & Mattee, 2001). This was brought about by the lack of knowledge about participatory experiential approaches among extension agents. The supply-driven national extension programs did not comprise cost sharing or farmers’ capacity building and self-reliance. There was little ownership by farmers. Isinika (2000) revealed that extension agents are lacking participatory problem-solving skills. This report showed that much research is being conducted on the personnel part of extension, leaving aside the beneficiaries (farmers). As a result, in many extension training programs farmers are not effectively involved in the decision making on what is to be taught, leading to poor participation in

extension education programs as well as a low adoption rate (Glendenning, Babu, & Okyere, 2010). As pointed out by Chi (2008), among the factors that lead to poor adoption by farmers are “farmers’ perceptions and education, extension workers’ knowledge, and methods of organizing and management of extension education program” (p.107).

Furthermore, Gautam (2000) pointed out that the central emphasis of the extension education program focus should aim to empower farmers. This can be done by using alternative means of giving farmers voice such as through cost sharing, supporting farmers’ organizations, and decentralization (Gautam, 2000).

Another factor affecting extension in Tanzania is the bureaucratic system; as explained earlier, the extension agents are civil servants in that “their allegiance is more to the government as the employer rather than to the farmers” (Mattee, 1994, p. 180). As a result, extension agents pay more attention to the employers’ demand compared to the immediate needs of farmers. In the meantime, farmers have no power to direct the tasks of extension agents or to express their desires and concerns; instead they are offered what the extension agent is willing to present (Mattee, 1994).

One additional factor is that farmers have limited accessibility to extension agents; “because of the dispersed nature of the field staff, few farmers have direct contact with these agents as and when necessary” (Mattee, 1994, p. 180). On average in Tanzania, one extension agent is responsible for serving 1,000 farming households; in reality, it is hard for the extension agent to serve them all (Mattee, 1994). The number of extension agents in Tanzania does not correlate with the need (Mvuna, 2010). Furthermore, Mvuna (2010) pointed out that the lack of prioritizing crops in specific areas leads to extension agents providing services regarding many crops, which reduces their efficiency.

### **Conceptual Framework**

This study was based on farmer participation in extension training programs and their perceptions of extension. As defined by Coats (1998), perception is the process that encompasses the senses and enables individuals to reach true beliefs about their environment. In this study, the term perception is used to describe the beliefs of farmers regarding extension education programs. Perception is the inborn ability to view things in their totality, but this does not create the actual mechanism of perception for action, as human perceptions can be shaped by their experience and training (Leeper, 1935). Hoffmann (2009) stated that “our perceptions usefully hide the complexity of the world, and guide adaptive behavior” (p. 148). This implies that farmer perceptions may also be used to explain the adoption of new technologies presented to farmers through extension services.

Ghimire (2010) stated that experimental psychologists currently theorize that our “behavior is unknowingly and unintentionally influenced by our perceptions” (p. 13). In this regard, the same applies to farmers’ abilities to change their behavior based on what extension programs deliver, which depends greatly on their perceptions of extension training programs.

### **Chapter Summary**

This chapter, through a review of literature, explained various aspects related to this study, including farmers’ perceptions of agricultural extension education programs, factors affecting extension services in developing countries, as well as the methods by which farmers receive agricultural information. It provided an overview of the extension services in the study area and justified the need to conduct this study to address the gaps identified in this chapter. The conceptual framework explained the main variable in this study, “perceptions,” and how they relate to the success of the extension education program.

## **CHAPTER 3. METHODOLOGY**

### **Introduction**

This chapter introduces the study area and the participants and describes the data collection procedures for the study. The research design as well as the description of the instrument used in collecting data for the study are explained. The assumptions and limitations of the study also are described in this chapter.

### **Research Design**

This study used a descriptive sample survey instrument, a questionnaire. It was designed to assist extension agents and agricultural researchers to understand more about the fundamental issues that affect farmers' participation in extension training and their awareness of agricultural educational activities provided in their area. These goals were achieved by learning more about farmers' motivational factors and their preferred delivery methods through the use of interviews of farmers. To ensure the validity of the data, the interviews were recorded and an audio recording was made of open-ended questions. The instrument was reviewed and tested prior to the study (Quresh, n.d.).

The main threat for internal validity of this study was interviewer effect; effective training of the interviewer helped to control this threat. Content validity of the instrument was assured through peer reviewers who were experts in this field. Pilot testing in the field helped to ensure validity of the questions and face validity. To ensure the external validity and generalization of the research findings, a proportional randomization process was used, as explained in the instrumentation section.

### **Kilolo District**

Kilolo district is located in Iringa region in the southern highlands zone of Tanzania. The region is located between latitudes 6°55' and 10°30' south of the Equator and between

longitudes 33°45' and 36°55' east of Greenwich (Ngasongwa, 2007). Iringa region borders Singida and Dodoma regions to the north, Morogoro region in the east, Ruvuma in the south, and Mbeya region to its west (Figure 1). The agricultural sector contributes more than 75% of the regional economy, and nearly 90% of the population earns its living from agricultural production and livestock keeping (Ngasongwa, 2007).

Crops grown in the region mainly include sunflower, tea, onions, tomatoes, fruits, pyrethrum, tobacco, coffee, and vegetables as cash crops. The food crops include maize, bananas, beans, cassava, sweet potatoes, round potatoes, peas, paddy, sorghum, finger millet, and groundnuts.

The arable land in Iringa region is estimated to be 2,214,000 hectares, but only 23.3% (514,843 hectares) of the arable land is being utilized for agricultural production (Ngasongwa, 2007). This shows that the region has a large unexploited land resource that needs to be developed in terms of crop production. The average land under cultivation per household in the Iringa region is 1.4 hectares.

Kilolo district is among the six districts in the Iringa region. It is divided into 12 wards and 81 villages and has the total area of 6,804.0 square kilometers (Ngasongwa, 2007). The district has a population of 204,572 people (Ngasongwa, 2007). The district is well known for horticultural crops such as tomatoes, cabbages, and onions. These crops provide small-scale farmers with substantial income despite the fact that they have no organized market outlets (Ngasongwa, 2007).

Although the agriculture sector is the main contributor to the region's GDP, it faces a number of problems such as (a) unreliable market outlets mainly for maize, (b) a poor transport network in the rural areas for transporting agricultural produce, (c) low prices



offered to farmers, and (d) difficult access to credit facilities for agricultural inputs by peasant farmers.

“Crop production for food security, poverty reduction and rural employment is increasingly becoming a pressing issue in the Iringa region” (Ngasongwa, 2007, p. 257). This makes crop production a potential area for investment in the Iringa region. Therefore, as pointed out by Sarker and Itohara (2009), agricultural information is a basic necessity to raise farmers’ knowledge and, hence, assist them in decision making about farming activities in order to improve their production.

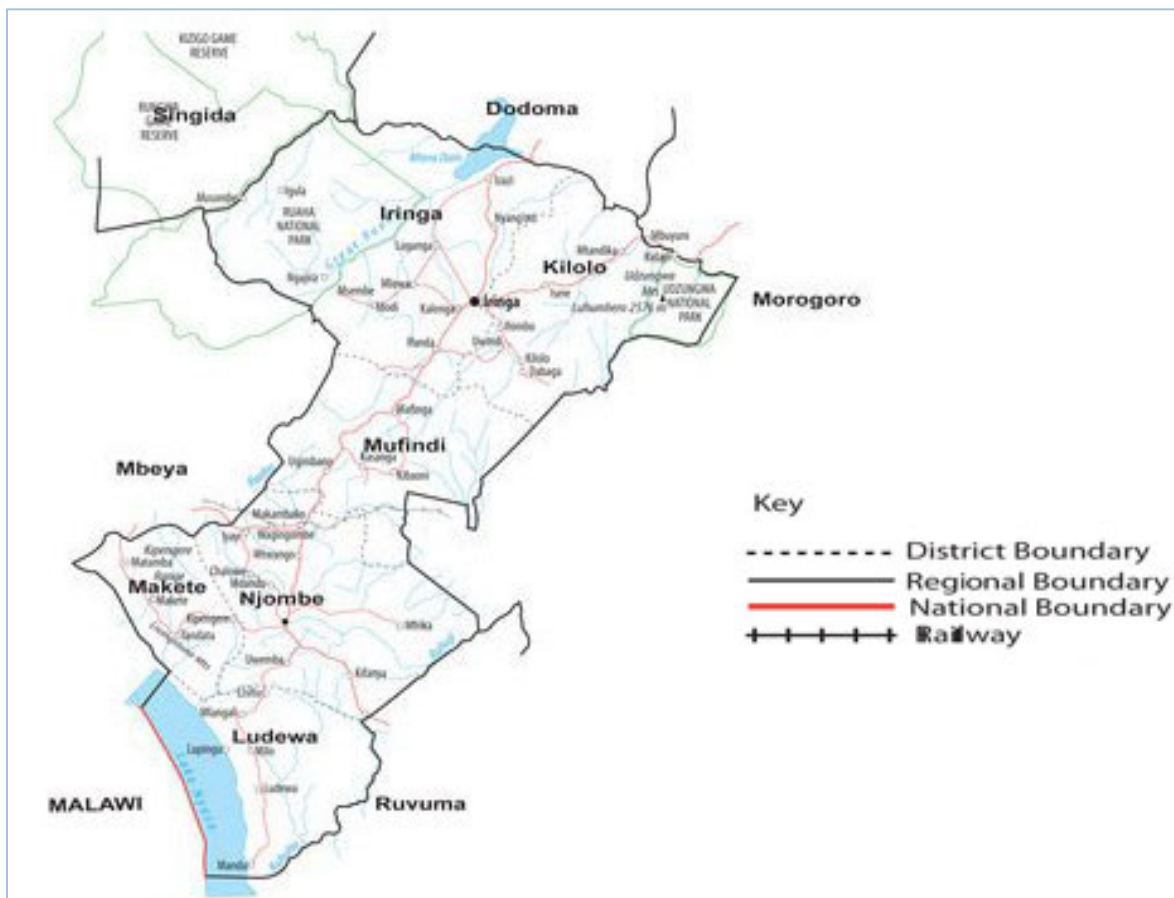


Figure 1. Iringa region map (Source: The United Republic of Tanzania, n.d.).

### **Subject/Data Source**

The population for this study consisted of farmers growing cash and food crops in Kilolo district in the southern highlands region of Tanzania. The list of all farmers by village was obtained from the district office register as per the 2012 national census. Proportional random sampling was used, whereby 10 villages were randomly selected and then 12 farmers were randomly selected from each village for the survey, resulting in a total of 120 farmers. Face-to-face interviews were used to collect data from the target population. The desired margin of error for this sample size was 5 percent. The sample size was due to the limited time and resources allocated for the study. Most of the places where farmers are located were not easily accessible by vehicles. If a larger sample had been used, it would have taken a long time to complete the study, which was supposed to be accomplished within one year.

### **Instrumentation**

A structured interview guide was used to collect data for this study (Appendix A). Each respondent was interviewed at his/her location in the study area. An interview was the preferred data collection method for this study because it was anticipated that many farmers in the study area were unable to read and write. No probing was used during the interview process, except for clarification of the instructions or questions.

The instrument was developed based on previous research conducted regarding farmers' perceptions as well as guidance from the principal investigator's major professor at Iowa State University and her advisor from Sokoine University of Agriculture. Experts in this field from Sokoine University of Agriculture and Iowa State University reviewed the instrument before testing. Also, the instrument was approved by the Iowa State University Institutional Review Board as indicated in Appendix B. Pilot testing interviews were conducted with a small sample selected from one of the villages, which helped in structuring

the interview procedures and modifying the questions. In the pilot-testing process, space was provided for criticism and suggestions to improve the items; this helped to ensure face validity of the instrument as well. The instrument was retested with 20 randomly selected farming households, where interviews were conducted to test the usefulness of the instrument, question clarity, language used, and consistency. After testing, the instrument was reviewed based on field experience and all corrections recognized were incorporated. This process helped to ensure that the instrument yielded reliable and unbiased data (Kvale, 2007). Farmers from the study population who were not included in the study were interviewed to test the reliability of the instrument, and the alpha coefficient for each category was established. Corrections were performed for items that seemed to be not reliable.

The interview questions were designed to measure farmers' awareness of extension training programs, perceptions regarding agricultural extension educational activities, motivation for participation in agricultural extension educational programs, delivery methods and content preferences, and factors hindering farmers from participating in extension training in their respective areas. The interview questions consisted of both close-ended and open-ended questions. The open-ended questions were used to tap into opinions and comments from participants. The interview guide was divided into five main sections: (a) farmers' awareness of extension services in the area, (b) farmers' perceptions of extension training and content, (c) motivational factors for participating in extension training, (d) delivery system preferences, and (e) social demographic features. Responses to interview items about awareness, motivational factors, and perceptions were given on a Likert-type scale, where A = strongly agree, B = agree, C = don't know, D = disagree, E = strongly

disagree. This section also contained some open-ended questions. The last section was the social demographic data, with responses to questions in the form of multiple-choice items.

Three interviewers were trained to help in the interview process. Training aimed to familiarize interviewers with the interview guide and the interview process. Every evening the researcher cross checked all interview sheets and audio clips for spelling mistakes, unanswered questions, miscalculations, and any form of cheating.

### **Validity**

The instrument was field-tested with farmers similar to those in the sample but not involved in the actual study. Based on the feedback given during field testing, some changes were made by modifying sentences and question format, which helped to improve the validity of the questionnaire.

### **Reliability**

Selected farmers from different villages not included in the study were used to determine the reliability of the instrument. The instrument had four sections and the alpha coefficient for each section was as follows: (a) awareness of extension services,  $\alpha = .658$ ; (b) farmers' perception of extension services,  $\alpha = .808$ ; and (c) motivational factors for participation,  $\alpha = .513$ .

### **Data Collection**

The data were collected in November and December, 2013, from 120 randomly selected households in Kilolo district in the southern highlands region of Tanzania through individual interviews using a structured questionnaire. The households were selected from 12 villages selected based on three ecological zones of the district. The villages selected were Ikokoto, Mahenge, and Msosa (lowland agro ecological zone); Kipaduka, Mbigili, and Kitumbuka (middle zone); and Mtitu, Utengule, Lukani, and Kitowo (highland agro

ecological zone). The researcher consulted the village leadership about the research and the aim of the study and expressed the need to conduct an interview with farmers in his/her area. An introductory letter from Iowa State University was provided (Appendix C). All selected participants were visited by the researcher to seek their willingness to participate in the study. The village official witnessed the principal researcher explaining the introduction letter to the respondent and explaining the study; farmers suggested a convenient time for the interview. Farmers were allowed to ask the researcher any clarifications about the study.

Each interview was completed in approximately 25 minutes. While the data was being collected, all the events going on in the area that might impact a farmer's response were recorded. Activities such as political meetings or distribution of subsidized farm inputs could lead to a difference in feedback from farmers in the area of study. Attention was given to effectively train the interviewers to emphasize that interviewees would not receive any benefit, such as input subsidies, by giving "good responses."

### **Data Analysis**

Data from the questionnaires were coded and entered into a computer. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) computer program. Descriptive statistics consisting of means, standard deviations, frequencies, and percentages were used to analyze the data. The analysis also involved the identification of the characteristics of the participants and how they related to various aspects of the study.

Means and standard deviations were used to analyze the data pertaining to objectives 1 to 4. Frequencies and percentages were used to describe farmers' demographic characteristics.

Analysis of variance (ANOVA) and *t*-tests were used to compare the differences in perceptions of farmers based on their demographic characteristics such as age, gender,

education level, and location. To identify the differences in perceptions between males and females, single and married farmers, and native and migrants, a *t*-test was performed. Also, differences in farmers' perceptions based on age, education level, and land owned were identified by computing the one-way ANOVA. On location, farmers were categorized into three main locations based on zones (lowland, midland, and highland zones).

### **Assumptions**

The assumption was made that farmers would be willing to share their ideas based on the questions presented to them. It was also assumed that extension agents in the area would be willing to accept and make use of the recommendations given after the study, based on farmers' responses. It was assumed that farmers who had attended trainings and applied some of the knowledge gained would give positive feedback about extension as compared to those who had never attended training or those who had attended but for one reason or another failed to implement what they had learned.

As per Leeper's (1935) views on human perceptions, perceptions can be modified through experience and training, it was assumed that findings from this study could help to shape farmers' perceptions on extension education programs by developing strategies to achieve this goal.

### **Limitations of the Study**

The sample size of this study was small (120 farmers) compared to the population of Tanzania as a whole, which is 44.9 million (Census, 2012). In this regard, the results of this study may not be generalizable to other parts of the country due to cultural diversity and differences in types of crops grown in various parts of the country as well as due to extension approaches used in different parts of the country.

The population of farmers used in this study comprised those listed in the village office documents as per the 2012 census. Farmers not listed in these documents may not have been represented in the sampling frame for this study.

There were some language barriers. The questionnaire for this study was translated into Swahili. However, not all farmers in the respective area understood Swahili fluently. As a result, in some cases it was necessary to further translate the questions into the local language of the area. This approach may have led to misinterpretation and, hence, altered the responses.

The current study aimed to study farmers' perceptions of agricultural extension education programs provided by extension agents, but extension agents tend to shift from one station to another. Therefore, farmers' perceptions may have been different based on the existing extension agents' performance in their areas and may have changed over time based on this factor.

Time commitment may have been another limitation. Farmers in the study area are always busy with farming activities, which led to a delay in some interviews, as farmers had to be at their farms, which, in most cases, were far away and not accessible by vehicles.

The titles used for extension agents were confusing. Some farmers referred to him/her mostly as the livestock officer (Bwana mifugo) and some as the extension officer (afisa ugani). Most of them referred to him/her as "Bwana shamba." This difference in the way people referred to an extension agent may have caused confusion.

## CHAPTER 4. FINDINGS

### Introduction

The purpose of this study was to identify farmer perceptions about extension education programs provided in the country and how it affects participation and, hence, the effectiveness of extension training programs. The study also identified the motivational factors that influence farmer participation in extension education programs as mainly to gain new ways of farming for the purpose of enhancing farmers' economic well-being through improved agricultural production.

The study used a questionnaire, which had four main sections: (a) farmers' awareness of extension services, (b) farmers' perceptions of extension training and content, (c) motivational factors for participating in extension training programs, and (d) delivery system preferences. Furthermore, demographic data, such as age, educational level, and number of acres owned, were compiled to help identify differences in perceptions and ideas based on the selected demographic characteristics. In general, the research had the following specific objectives, which guided the overall purpose of the study:

1. Identify farmers' general perceptions about agricultural extension education programs,
2. Identify the extent to which farmers participate in agricultural extension education training programs,
3. Identify preferred methods for delivering agricultural extension training programs,
4. Identify factors that influence farmer participation in agricultural extension education training programs, and
5. Identify selected demographic data and analyze the comparisons among variables.



The aim of this chapter is to describe the findings based on the collected data using individual farmer interviews with the aid of a structured questionnaire. It will also describe farmers' perceptions about extension education programs provided in their respective villages and how their perceptions impacted their participation and, hence, the success of the program objectives.

### **Demographic Characteristics**

This section describes the demographic characteristics of the farmers who participated in this study. These demographic characteristics include gender, marital status, education level, age, crops grown, animals kept, and farmers' place of origin.

The gender distribution of the research participants is presented in Table 1. Sixty percent ( $n = 72$ ) of the participants were male. Of the farmers interviewed, most of them 79.2% ( $n = 95$ ) were married. Only 5.0% ( $n = 6$ ) were single, whereas 1.7% ( $n = 2$ ) were divorced and 14.2% ( $n = 17$ ) had partners who had died. A majority of the participants interviewed 84.2% ( $n = 101$ ) were native to their respective village, leaving only 15.8% ( $n = 19$ ) who had migrated to their respective villages.

As indicated in Table 2, the most prevalent age range, represented by 40.8% ( $n = 49$ ) of the farmers interviewed was 46 to 50 years of age. Only 3.3% of the participants were between 18 and 25 years of age, and 5.0% were 56–60 years of age. The active group of the participants (36–45 years of age) comprised 23.3% ( $n = 28$ ) of the farmers interviewed.

Almost half of the farmers (48.3%,  $n = 58$ ) owned about two to five acres on which different crops were being grown (Table 3). Just over one third of the participants (34.2%,  $n = 41$ ) owned more than 10 acres, but most of them indicated that they did not cultivate all of it. Instead they leased some of it to other farmers in need. In addition, 17.5% ( $n = 21$ ) of the participants had farms with less than 2 acres. Most of the farms were not located at one site.

Table 1

*Participants of the Study by Gender (N = 120)*

Gender	<i>n</i>	%
Male	72	60.0
Female	48	40.0

Table 2

*Age of the Participants (N = 120)*

Age range	<i>n</i>	%
18–25 years	4	3.3
26–35 years	19	15.8
36–45 years	28	23.3
46–50 years	49	40.8
51–55 years	14	11.7
56–60 years	6	5.0

Table 3

*Farm Size of the Participants (N = 120)*

Farm size	<i>n</i>	%
Less than 2 acres	21	17.5
2–5 acres	58	48.3
6–10 acres	32	26.7
11–20 acres	7	5.8
More than 20 acres	2	1.7

Farmer level of education is indicated in 4. A majority of the farmers interviewed (66.7%,  $n = 80$ ) had completed standard seven, and 25.8% ( $n = 31$ ) had completed standard four. Only 4.2% ( $n = 5$ ) had completed form four level of education, and 3.3% ( $n = 4$ ) had never been to school.

Table 4  
*Participants' Level of Education (N = 120)*

Education level	<i>n</i>	%
Never been to school	4	3.3
Standard four	31	25.8
Standard seven	80	66.7
Form four	5	4.2

Cows and pigs were the most common livestock kept by most participants, and very few farmers (8.3%,  $n = 10$ ) did not keep any animals (Table 5). Other animals raised included goats and chickens. As shown in Table 6, maize and tomatoes were the major crops grown in the district. Many of the farmers in most of the villages in all three zones

Table 5  
*Animals Kept by Participants (N = 120)*

Livestock kept	<i>n</i>	%
Cows	31	25.8
Goats	25	20.8
Pigs	31	25.8
Chickens	23	19.2
None	10	8.3

Table 6  
*Crops Grown by Participants (N = 120)*

Crops grown	<i>n</i>	%
Maize, tomatoes, sunflowers, and beans	9	7.5
Tomatoes, maize, and sunflowers	23	19.2
Tomatoes and maize	41	34.2
Beans, maize, and sunflower	14	11.7
Groundnuts, simsim, and beans	5	4.2
Sorghum, groundnuts, and simsim	2	1.7
Maize and groundnuts	6	5.0
Maize and legumes	8	6.7
Maize, legumes, and sweet pepper	2	1.7
Maize, onions, and legumes	9	7.5
Maize, legumes, tomatoes, and Irish potatoes	1	0.8

were growing these two crops. Maize was the main food crop in the area and tomato was the main cash crop.

#### **Farmers' Awareness of Agricultural Extension Training Programs**

This section provides data pertaining to farmers' awareness of extension services in their respective areas. Farmers' understanding of extension services and extension agents as well as their attendance and the way they get information about extension training is described using frequencies and percentages. This section also describes the way farmers in the study area get information. Furthermore, this section describes farmers' participation in groups created by extension agents as well as their understanding about where they can get assistance about their crops and livestock.

### **Understanding and Awareness of Extension Services**

As indicated in Table 7, 50.8% ( $n = 61$ ) of the participants interviewed had no idea about the meaning of extension, whereas 22.5% ( $n = 27$ ) had some understanding of the meaning of extension and the remaining participants (26.7%,  $n = 32$ ) claimed to understand the meaning of the term extension. Farmers who claimed to understand this term were asked to explain it. Most of them were correct in their description. Those who had no idea about the meaning of this term were told the meaning during interview session.

Of the farmers interviewed, 85.0% ( $n = 102$ ) indicated that they knew the extension agent for their respective area, and the remaining 15% ( $n = 18$ ) stated that they didn't know the extension agent in their respective area. Just over half (51.7%,  $n = 62$ ) had ever attended extension training programs in their respective area, but not all of them had attended training programs provided by the local government extension agent. Some participants had attended training provided by NGOs (nongovernment organizations) located in their villages, such as One Acre Fund Tanzania (for Mtitu and Utengule villages) and MUVI (Muunganisho wa Ujasiriamali Vijijini; Kitumbuka, Kipaduka and Kitowo villages). NGOs such as these provide training to farmers in some villages on production and entrepreneurship skills related to agricultural production.

Only 21.7% ( $n = 26$ ) of the farmers belonged to farmer groups. Most of these groups were those created by NGOs, such as the above-mentioned MUVI and One Acre Fund Tanzania. The remaining 78.3% ( $n = 94$ ) did not belong to any farmer groups.

Most of the participants (70%,  $n = 84$ ) claimed that they knew where to get agricultural advice in case they needed it for their farms (crops and livestock). The remaining 30% ( $n = 36$ ) declared that they had no idea where to get advice in case they

Table 7

*Participants' Awareness of Extension Services (N = 120)*

Variable	<i>n</i>	%
Understanding of extension		
No idea of the meaning of extension	61	50.8
Some understanding of extension	27	22.5
Understand meaning of extension very well	32	26.7
Know extension agent		
Yes	102	85.0
No	18	15.0
Ever attended extension training		
Yes	62	51.7
No	58	48.3
Belongs to any farmer group		
Yes	26	21.7
No	94	78.3
Knows where to get agricultural advice		
Yes	84	70.0
No	36	30.0
Specific areas to go to get advice		
Agrochemical shops	49	40.8
Extension agent	33	27.5
Ask a famous farmer in my area	8	6.7
Not applicable	30	25.0
Training attendant in the family		
Father	16	13.3
Mother	20	16.7
Father and mother	23	19.2
All family members	1	0.8
Attendance per year		
Once	29	24.2
Twice	23	19.2
Thrice	9	7.5
None	59	49.2
First heard about extension		
Through village meetings	47	39.2
Visited at home by extension agent	5	4.2
Visited at home by farmer leader	4	3.3
Through media	3	2.5
From a friend	36	30.0
I have never heard about it	25	20.8

needed technical assistance with their crops or livestock. Most of the participants added that they had never encountered any problem that forced them to look for further technical assistance from agricultural professionals. Of those who claimed to know where to get agricultural advice for their crops and livestock, 40.8% ( $n = 49$ ) got it from agrochemical shops around their area, 27.5% ( $n = 33$ ) from the extension agent office located in their area, and the remaining 6.7% ( $n = 8$ ) were used to asking well-known farmers close to their areas.

Of the households visited, 16.7% ( $n = 20$ ) of the participants mentioned a woman as the one who attended the training program, whereas 13.3% ( $n = 16$ ) of the families mentioned a man as the main attendant at the training program. In addition, 19.2% ( $n = 23$ ) of the families reported that both parents attended agricultural training program, and only 0.8% ( $n = 1$ ) reported that all family members attended training programs when available.

The frequency of attendance at agricultural training programs provided among interviewed farmers is also indicated in Table 7. One quarter (25.0%,  $n = 30$ ) indicated that they attended training programs only once per year, 19.2% ( $n = 23$ ) indicated that they attended training programs twice in a year, and only 7.5% ( $n = 9$ ) of the participants attended three times in one year. All participants explained that they didn't have a specific timetable for attending the training programs, but they were at the beginning and the end of the crop season.

The largest group of farmers interviewed (39.2%,  $n = 47$ ) indicated that they received information about extension training programs in their villages through village meetings, which were conducted for various development activities and in which the village extension agent is also invited to talk to farmers and describe to them the training pattern in the specific area. However, 30% ( $n = 36$ ) of the participants indicated that they first heard about

extension training programs through friends and neighbors. Moreover, 20.8% ( $n = 25$ ) of the participants had never heard about extension trainings being conducted in their respective areas. Additionally, 4.2% ( $n = 5$ ) and 3.3% ( $n = 4$ ) got this information by being visited at home by an extension agent and farmer leader, respectively. The remaining 2.5% ( $n = 3$ ) of the participants received this information through media, mainly through agricultural radio programs in which extension agents provide education about various agricultural production activities.

### **Farmers' Perceptions Regarding Extension Agents' Performance**

The mean scores (based on a Likert-type scale in which 1 = *strongly agree*, 2 = *agree*, 3 = *I don't know*, 4 = *disagree*, and 5 = *strongly disagree*) of the farmers' perceptions about the quality of the extension agent working in their respective areas are displayed in Table 8. The mean score of farmers' perceptions and views about the performance of the extension agent in providing useful ideas to help farmers improve production was 2.7, whereas the mean score of their perception of the availability of the extension agent in helping farmers when they are in need was 2.9. Furthermore, the mean scores of the farmer's perceptions of the extension agents' preparedness for the training programs was also rated 2.9; extension agents having all training facilities was rated 3.2; extension agents being friendly and easily approachable was rated 3.3; and extension agents providing continuous support to help farmers implement technologies was rated 3.4.

As shown in Table 9, 37.5% ( $n = 45$ ) of the farmers interviewed disagreed with the statement that extension agents play a great role in helping farmers improve production, whereas 30.8% ( $n = 37$ ) agreed with the statement and the remaining 31.7% ( $n = 38$ ) responded that they



didn't know. Most of those who disagreed with the statement explained that extension agents did not visit them and most of the time the advice given was not useful.

Table 8

*Participants' Perceptions of Extension Agents' Efficiency in Training and Helping Farmers (N = 120)*

Perception	<i>N</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
Extension agent provides good ideas that help improving my production	120	1.00	5.00	2.6583	0.82499
Availability of extension agent to help farmers	120	1.00	4.00	2.8917	0.64555
Extension agent well prepared during training session	120	2.00	4.00	2.9417	0.45459
Extension agent has all training facilities	120	2.00	5.00	3.1917	0.55452
The efficiency of the extension agent in helping farmers	120	1.00	5.00	3.2417	0.97873
Extension agents are friendly and easily approachable for advice	120	1.00	5.00	3.3083	0.91482
Extension agent provides continuous support to help the application and implementation of the information taught	120	2.00	5.00	3.4417	0.54689

*Note.* Perception statements were rated on a Likert-type scale on which 1 = *strongly agree*, 2 = *agree*, 3 = *I don't know*, 4 = *disagree*, and 5 = *strongly disagree*.

Table 9

*Participants' Perceptions of Extension Agents' Role in Helping to Improve Production (N=120)*

Do you believe that extension agents play a role in helping farmers to improve production	<i>n</i>	%
Yes	37	30.8
No	45	37.5
I don't know	38	31.7

### **Farmers' Perceptions of Government Support to Extension Services**

Farmers' perceptions of how the government supports extension services in their respective areas are displayed in Table 10. The majority of the farmers interviewed (77.5%,  $n = 93$ ) disagreed with the statement that the government plays a positive role in helping farmers through the extension service. The mean score of the responses for the statement that government plays a positive role in helping farmers through the extension service ( $M = 4.10$ ; rated on a Likert-type scale of: 1 = *strongly agree*, 2 = *agree*, 3 = *I don't know*, 4 = *disagree*, and 5 = *strongly disagree*) indicates that most farmers disagreed with this statement.

Farmers gave various reasons for this perception such as lack of transportation for extension agents, lack of inputs to take care of the demonstration plots where they exist, and the fact that most extension agents do not have quality houses built for them in their assigned villages. This situation forced most of them to live outside of the village and, as a result, it narrowed their accessibility to farmers. Also, in some villages (Utengule and Mtitu) farmers complained that the government offered them subsidized fertilizers that are not suitable to their area (The Minjingu Mazao). The remaining 16.7% ( $n = 20$ ) of the farmers indicated that they "don't know" whether this statement was true or not.

Table 10

*Participants' Perceptions of Government Support for Extension (N = 120)*

Government plays a good role in helping farmers through extension services	<i>n</i>	%	<i>M</i>	<i>SD</i>
Agree	7	5.8		
I don't know	20	16.7		
Disagree	47	39.2		
Strongly disagree	46	38.3		
Overall	120	100.0	4.1000	0.88308

Perception statement was rated on a Likert-type scale of: 1 = *strongly agree*, 2 = *agree*, 3 = *I don't know*, 4 = *disagree*, and 5 = *strongly disagree*.

### **Usefulness of Extension Education Programs**

The distribution of farmers based on their view of the usefulness of extension services in improving their production is shown in Table 11. A majority of the participants agreed that agricultural extension programs are very useful in helping to improve their production: 29.2% ( $n = 35$ ) indicated that the extension training programs are very useful, and 44.2% ( $n = 53$ ) indicated that the extension training programs are useful in helping farmers to improve production. With changes in prevailing weather and an increased number of new crop and livestock diseases, there is a great need to have professional advisors help farmers cope with the changes in input usage. Another 15.0% ( $n = 18$ ) of the participants said that they didn't know whether extension services are useful or not for them because they had never used and had never seen anyone who benefited from extension services. Few participants 5.8% ( $n = 7$ ) confessed that the extension services were not useful. Most of these participants gave the reason that, most of the time, extension programs do not help them with farm inputs such as free fertilizer and improved seeds.

Table 11

*Participants' Perceptions of the Importance of the Extension Service (N = 120)*

Parameter	n	%
Usefulness of extension education programs		
Very useful	35	29.2
Useful	53	44.2
I don't know	18	15.0
Somewhat useful	7	5.8
Not useful	7	5.8
Rating of extension service in helping farmers to improve production		
Very effective	2	1.7
Effective	52	43.3
Less effective	66	55.0
Extension service offers what you need		
Strongly agree	1	0.8
Agree	14	11.7
I don't know	43	35.8
Disagree	56	46.7
Strongly disagree	6	5.0
Participation in extension education programs help to improve my production		
Strongly agree	5	4.2
Agree	63	52.5
I don't know	37	30.8
Disagree	14	11.7
Strongly disagree	1	0.8
Participation in extension education programs help to increase income through farming		
Strongly agree	5	4.2
Agree	48	40.0
I don't know	47	39.2
Disagree	20	16.7

These data support the notion some farmers have that, for them to improve their production, they must be given free inputs rather than being given only knowledge and techniques.

Of the farmers interviewed, 55% ( $n = 66$ ) declared that the extension services were less effective in helping farmers to increase their production. The remaining participants

43.3% ( $n = 52$ ) responded that the extension services were effective in assisting farmers to improve production. Responses to the survey also indicated that 46.7% ( $n = 56$ ) of the participants disagreed with the point that the extension services offer what they really need, whereas about 35.8% ( $n = 43$ ) of the interviewed participants indicated that they didn't know whether or not the extension service offered what they needed (Table 11).

The farmers interviewed perceived that crop production had increased due to attendance at extension training programs. Of those interviewed, 52.5% ( $n = 63$ ) agreed with this point, giving support that, through extension training programs, most participants were assisted in minimizing input usage and proper spacing, especially in maize. In addition, 30.8% ( $n = 37$ ) of the participants declared that they did not know whether this statement was true or not, and about 11.7% ( $n = 14$ ) of the participants disagreed with the point that extension education programs for farmers may help to increase their production. On the issue of increased income, 40.0% ( $n = 48$ ) of the participants agreed with the point that extension services play a part in helping farmers improve their income through agricultural activities. Another 39.2% ( $n = 47$ ) of the participants said that they did not know whether extension services helped to increase their farm income, and 16.7% ( $n = 20$ ) of the participants did not agree with this statement.

### **Application of Extension Technologies and Knowledge**

Most of the farmers interviewed (57.5%,  $n = 69$ ) reported that they did not know whether training programs were provided for them in such a timely way to be able to apply the knowledge in the field (Table 12). This information indicates that many farmers were not keen about what was being taught and or did not attend most of the training programs. Of those surveyed, 22.5% ( $n = 27$ ) agreed that there is timely provision of extension training

programs in their respective areas and the remaining 20.0% ( $n = 24$ ) did not concur with this statement.

On the issue of the applicability of the training lessons and technologies, only 24.2% ( $n = 29$ ) of the interviewed participants declared that the training program given could be easily applied. However, the majority of the participants (56.7%,  $n = 68$ ) reported that they did not know if the lessons provided through the extension service could be easily implemented or not. The remaining 19.1% ( $n = 23$ ) of the participants disagreed that training programs given could be easily implemented. Most of the participants gave the same reason: that they were trained to use inputs that they were incapable of purchasing. Due to this situation, most of the participants were discouraged about attending training programs and concentrated on their local ways of production.

Table 12

*Participants' Views of Applicability and Timely Provision of Extension Trainings (N = 120)*

Parameter	<i>n</i>	%
Training provided at times when can be applied in the field		
Agree	27	22.5
I don't know	69	57.5
Disagree	24	20.0
Trained lessons can easily be implemented		
Agree	29	24.2
I don't know	68	56.7
Disagree	22	18.3
Strongly disagree	1	0.8

### **Extension Methods and Farmer Preferences**

The distribution of responses based on the participants' views about the most preferable extension teaching methods, preferable extension approaches, and their preferred way of getting information related to their agricultural production (crops and livestock) is

shown in Table 13. Most of the farmers interviewed (85.0%,  $n = 102$ ) indicated that they prefer learning-by-doing through demonstrations with hands-on activities. Most of the remaining participants (14.2%,  $n = 17$ ) preferred learning through group discussions and activities.

The most preferred extension approach was the training and visit approach (40%,  $n = 48$ ), which means, according to most of the respondents that the extension agent is required to visit each farmer and give them enough opportunity to explain their problems and get the appropriate advice from the extension agent. The percentages of farmers interviewed who preferred the farmer field school and farmer-to-farmer approaches were 29.2% ( $n = 35$ ) and 30.0% ( $n = 36$ ), respectively, whereas contract farming, preferred by only 0.8% ( $n = 1$ ), was the least preferred, as many farmers in the study area seemed to not be very familiar with the approach.

Table 13

*Participants' Views of Extension Information Delivery Preferences (N = 120)*

Parameter	<i>n</i>	%
Extension teaching method		
Demonstration with hands-on experience	102	85.0
Group discussion and group activities	17	14.2
Problem solving activities	1	0.8
Approach most preferred		
Farmer field school	35	29.2
Training and visit	48	40.0
Farmer to farmer	36	30.0
Contract farming	1	0.8
Way of getting information		
Through media	17	14.2
Through cellphones	11	9.2
Through farmer meetings	43	35.8
Through friends	47	39.2
Through village noticeboard	2	1.2

Furthermore, many farmers interviewed (39.2%,  $n = 47$ ) commented that they preferred to get agricultural information from their friends who they believed were more experienced than they were. In addition, friends were easily available in their living environment as compared to other alternatives mentioned. Other participants identified local village meetings (35.8%,  $n = 43$ ) as the best place for participants to get agricultural information.

Of the participants interviewed, 14.2% ( $n = 17$ ) said that they preferred to get agricultural information through media and another 9.2% ( $n = 11$ ) received information through cellphones, by which they could easily get market information about various crops via a special system set up by network companies and the MAFC through various crop boards. Only 1.7% ( $n = 2$ ) of the participants mentioned village notice boards as the best place for them to get agricultural information.

### **Factors Influencing Farmers' Participation in Agricultural Extension Education Training Programs**

There was great diversity on the factors that motivated the farmers interviewed to attend extension-training programs, as shown in Table 14. Of the farmers interviewed, 14.2% ( $n = 17$ ) indicated that the desire to get new knowledge and techniques to apply in their fields motivated them to attend training programs whereas 17.5% ( $n = 21$ ) of the participants reported that wanting to know about the effective use of proper inputs in their fields was what forced them to attend training programs in their respective areas. Another 11.7% ( $n = 14$ ) of the participants reported that they attended training programs because they wanted to be aware of the farm input subsidies in their villages and be prepared to buy them when possible. Only 5% ( $n = 6$ ) of the participants reported that they attended training



programs just because friends convinced them, and another 1.7% ( $n = 2$ ) were motivated to attend agricultural extension education training programs because they just wanted to gain awareness about market issues related to crops they produced.

On the other hand, the reason that made farmers interviewed not want to attend extension training programs was identified by 51.7% ( $n = 62$ ) of the participants as being that they didn't get information about the training programs. Another group (40.0%,  $n = 48$ ) reported that they didn't know the place where training programs were conducted. In addition, 4.2% ( $n = 5$ ) of the participants claimed that they did not know the time at which training programs were offered in their areas and the rest (3.3%,  $n = 4$ ) reported that they failed to attend agricultural extension education programs in their respective villages because most of them were held at times when they had other obligations.

Table 14

*Participants' Views of Factors for Attending or Not Attending Extension Trainings (N = 120)*

Parameter	<i>n</i>	%
Reasons that motivate to participate in extension education programs		
Desire to get new knowledge to apply in my field	17	14.2
Convinced by friend	6	5.0
Want to learn about effective use of proper inputs in my field	21	17.5
Want to get awareness on market issues	2	1.7
Be aware of the farm input subsidies in my area	14	11.7
Not applicable/never attended	60	50.0
Reasons for not attending extension trainings		
Don't know when they are conducted	48	40.0
Don't know the time for the training	5	4.2
Trainings given are not of my interest	1	0.8
Held at time when have other obligations	4	3.3
Don't get information about the training	62	51.7

### Farmers' Communication with Extension Agents

On the issue of farmers' communication with extension agents, many farmers interviewed (40.8%, ( $n = 49$ )) claimed that extension agents did not visit their local areas regularly and, hence, this was the main reason hindering them from communicating with extension agents (Table 15). Another 37.5% ( $n = 45$ ) of the participants reported that they had never tried to find an extension agent to help with /her.

Table 15

*Participants' Views of Factors Hindering Them to Communicate with Extension Agent (N = 120)*

Factors hindering communication with extension agent	<i>n</i>	%
Difficult to find him/her in the office	4	3.3
Lives out of the village	7	5.8
Has many appointments to make	2	1.7
Doesn't visit my area regularly	49	40.8
I have never tried to find him/her in person	45	37.5
I don't know him/her	13	10.8

their agricultural activities. Another group of 10.8% ( $n = 13$ ) of the participants reported that what hindered them from consulting an extension agent was because they didn't know him/her, and 5.8% ( $n = 7$ ) of the participants claimed that the extension agent lived out of the village, making it difficult to have easy access to an extension agent. The remaining 3.3% ( $n = 4$ ) of the participants said that it was difficult to find an extension agent in the office, hence it became difficult to find him

### **Differences in Farmers' Perceptions of Extension Services Based on Demographic Characteristics**

As described in chapter 3, a *t*-test was used to compare the perceptions of the participants (farmers) based on their demographic characteristics. The *t*-test was used to identify differences in perceptions between gender and also among farmers based on their level of education.

As shown in Table 16, more men attended extension training programs as compared to women. However, on the issue of farmers' attendance at extension training in relation to gender, there was no statistical significance difference between males and females at the .05 significance level ( $p = .53$ ).

Table 16

*Participants' Attendance at Extension Training by Gender*

Ever attended extension training program	Gender	
	Male	Female
Yes	43	20
No	29	28
Mean difference	-1.8056	-1.8056
<i>t</i>	-1.955	-1.952
Sig. (2-tailed)	.053	.054

The results of the analysis of variance indicated that there were no statistically significant differences between the different levels of education and the farmers' perception of extension services in the study area (Table 17).

Table 17

*One-way Analysis of Variance for Farmers' Perception of Extension Services by Participants' Level of Education*

Farmers perception of extension services	<i>df</i> (total)	<i>M</i>	Sig.
Usefulness of extension education programs ever attended	119	2.635	.053
Extension agent provides good ideas that help improving my production	119	1.459	.229
The efficiency of extension agent in helping farmers	119	0.194	.900
Government plays good role in helping farmers through extension services	119	1.288	.282
Do you think the extension service offers what you really need	119	0.946	.421
Participation in extension education programs helps to improve my production	119	1.534	.210

Table 18

*Means of Farmers Perceptions of Extension by Education Level*

Perception statements	Never been to school ( <i>n</i> = 4)	Standard four ( <i>n</i> = 31)	Standard seven ( <i>n</i> = 80)	Form four ( <i>n</i> = 5)
Usefulness of extension education programs	3.00	3.10	2.08	1.20
Usefulness of extension agent ideas	3.50	2.64	2.62	2.60
Efficiency of extension agent	Nil	3.25	3.26	3.00
Government plays a good role in helping farmers through the extension service	4.75	3.90	4.11	4.40
Extension service offers what you really need	3.50	3.45	3.38	4.00
Participation in extension education programs helps to improve my production	3.25	2.61	2.45	2.60

*Note.* Perceptions rated as: 1–2 = positive perception, 3 = neutral, 4–5 = negative perception.

Descriptive statistics indicated that participants at all educational levels had negative perceptions of extension services and the way programs were offered (Table 18). This agrees with earlier results presented, which showed that 77.5% disagreed that government plays a positive role in helping farmers through extension services. (Table 11).

### **Advice of Participants on Improving Extension Education Programs**

On the questionnaire for this study, space was provided for participants to give their advice on what could be done to improve the extension education programs in their area. The information obtained was useful for the purpose of this research study.

Almost half of the participants (49.2%) suggested increasing the number of extension agents in the study area (Table 19). Fifteen percent of the participants commented that training programs should be offered more frequently, whereas another 14.2% commented that there was a need to employ extension agents who are more experienced and provide more in-service training. These programs would enable extension agents to deal with agricultural problems that occur daily rather than focusing on what they were taught in colleges. On this issue, the farmers also insisted on the need for government to have a special evaluation system that ensures that extension agents deliver to farmers whatever was given to them through in-service training programs. Also, 6.7% of the farmers interviewed commented on the role of government to help extension agents to better perform their duties by giving them working facilities such as transportation and training materials. In addition, 5.8% of the participants commented that

Table 19

*Participants' Advice on What Can Be Done to Improve Extension Services in the Area*

Advice given	<i>n</i>	%
Increase number of extension agents	59	49.2
Increase effectiveness in disseminating information about the training programs to be done	7	5.8
Extension agents should be there when we are given subsidized fertilizers	4	3.3
Employ extension agents with experience and updated	17	14.2
Training programs should be offered more frequently	18	15.0
Government should help extension agents with facilities to help them perform better in their work	8	6.7
Training programs should go along with giving out farm inputs	7	5.8

training programs provided should go along with farm inputs related to the training they are given. Finally, there is a need to strengthen the dissemination of information about the training programs to be conducted, as most of the participants claimed that they had not attended training programs because they didn't receive information about, and were not aware of such training programs in their area.

## **CHAPTER 5. DISCUSSION**

The overall purpose of this study was to assess the general perceptions of farmers regarding agricultural extension education programs in Kilolo district, Tanzania. The study aimed to identify the extent to which farmers participate in extension training programs in their areas, their preference for extension delivery methods, as well as factors that influence their participation in extension trainings in their localities. Furthermore, the study also identified differences in demographic characteristics.

This chapter presents a discussion of the findings and provides a link to the literature that was used as the foundation for this study. The chapter begins with a discussion based on the farmers' demographic data and then their perceptions of extension education programs. Furthermore, the discussion compares the study's results with other academic sources to relate the findings and further arguments to the similarities or differences. Additionally, farmers' advice on what to be done to improve extension education programs is also presented.

### **Demographic Characteristics**

As reported by a number of studies, demographic characteristics, such as age, sex, and land owned all have an impact on farmers' perceptions of extension services, as these aspects have a positive effect on farmers technical efficiency and, hence, influence the need to look for more of it through extension services (Ahmad et al., 2002, as cited in Msuya, Hisano, & Nariu, 2008; Amos, 2007, as cited in Msuya et al., 2008; Basnayake & Gunaratne 2002, as cited in Msuya et al., 2008; Kibaara, 2005, as cited in Msuya et al., 2008; Tchale & Sauer 2007, as cited in Msuya et al., 2008). Msuya et al. (2008) also pointed out that demographic factors, such farmers' age, education level, land holding size, gender, and access to extension services, have an impact on how farmers perceive the usefulness of

extension services in improving their technical efficiency in agriculture and hence improving their production.

The target population for this study was all small-scale farmers from the 81 villages of Kilolo district. From the target population, a sample of 120 randomly selected farmers from 12 villages of the district was selected to take part in this study. Of the participants interviewed, 60% were male and 40% were female. This finding is consistent with the study by Chenyambuga, Nalaila, and Mbaga (2008) in which 95% of the sample of 20 participants interviewed in the same district were male. The reason for this similarity of having a large number of male participants might be due to the selection process and the similarity of the study area, where most of the households are headed by males. This disparity was also reflected in the number of women taking part in extension education training as well, as in this study, the number of men who had ever attended extension training outweighed that of women. This finding concurs with the study by Haug (1999), who concluded that in most cases women have limited access to extension services.

The age range reflecting the largest group of the participants interviewed was 46 to 50 years. The findings regarding the distribution of participants based on age in this study seemed to be consistent with the study by the Economic and Social Research Foundation ([ESRF] (2010). Also, in their study, Modibo, Nthoiwa, and Tsalaesele (2010) concluded that the farming population in most developing countries is aging, thus hindering the agricultural sector in such places to advance to a more commercial basis as the adoption rate among older farmers is lower. The majority of the farmers interviewed (79.2%,  $n = 95$ ) were married. This finding is also in line with the study by ESRF (2010), which indicated that about 90% of the 65 farmers interviewed were married.



The education level of most of the participants in this study (66.7%) was the lowest education level at standard seven. This finding concurs with the study by Msuya et al. (2008) and Modibo et al. (2010) indicating very low levels of education among small-scale farmers in the study area. This is attributed mainly to the fact that most youth, after finishing school, migrate to urban areas looking for a better life. Hence, the agricultural sector in rural areas is dominated by elders 46–50 years of age, who for one reason or another, have had no access to moving to the urban areas. In their study, Liviga and Mekacha (2008) reported that the aim of most youth who get a chance to go to school is to migrate to urban areas and look for opportunities for nonagricultural employment. This shows the negative attitude many youth have about agricultural activities. Moreover, studies have shown that youth have poor perceptions of the socioeconomic and cultural conditions of their local places (Liviga & Mekacha, 2008). A low education level of farmers also leads to farmers' poor ability to grasp the technologies presented to them (Abdullah & Samah, 2013), which in turn leads to poor farmer attendance at extension service programs as they find it difficult to conceptualize the concepts presented. Modibo et al. (2010), in their study of subsistence farmers in Botswana, found that the majority of the farmers had only a primary level education and some had never gone to school. This implies that there is a great need for extension agents to be very keen and give special treatment to such groups of farmers so that they can grasp the innovations being introduced to them (Modibo et al., 2010).

This study found that most farmers had small farms ranging from two to five acres. However, most of the farmers claimed to have larger areas that are left unutilized due to lack of improved farm inputs to enable them to cultivate larger areas. This is in line with the study by Mugabi (2013) who commented that Tanzania has a large area of arable land but

estimated that only 23% of it is being utilized. Vargas-Lundius (2009) also mentioned higher costs of inputs and limited capacity of resource poor farmers to respond to price incentives and price instability as factors that discourage small-scale farmers from making agriculture a more profitable enterprise; hence, farmers end up producing just for consumption.

As pointed out by Lokina, Nerman, and Sandefur (2011), total farm output is higher if bigger farms have higher productivity as compared to small ones. This may justify the reason for food insecurity in most rural families despite the fact that they are busy with farming activities each and every season. The findings of a study by Knueppel, Demment, and Kaiser (2009) indicated that, of the 237 rural households that were involved in the study in the Iringa region, 48.1% of the households were severely food insecure.

The present study found that the most commonly cultivated food crop in the study area was maize. This concurs with the findings that maize is the main food crop grown by most farmers in Tanzania (Msuya, et al., 2008).

Only 21.7% of the interviewed farmers declared they belonged to any farmer group where they had meetings for training on various topics. Most of the farmer groups are those coordinated by NGOs (Non-Government Organizations). This indicates that public village extension officers (extension agent) did not form farmer groups. Hence, this has led to poor attendance. Farmers lack proper coordination among themselves and from the extension agent. Farmers are very dispersed, and the extension agents cannot afford to visit them all to disseminate useful information. As pointed out by Vargas-Lundius (2009), establishment of farmer groups helps to strengthen extension services in most areas. This is because, through farmer groups, communication among farmers and sharing of knowledge given through extension training programs is expanded, therefore helping to sharpen farmer decision-

making abilities (Mvuna, 2010). As stated by Anderson et al. (2006), NGO-supported extension services often have better performance. However, the shortcoming in these types of services is that they cannot be spread to the national level due to funding issues.

Most of the participants interviewed (70%) revealed that they knew where to get agricultural related advice for their crops and livestock. Most of them mentioned agrochemical shops as the main source of information when they encountered any problems. This calls for the government to put emphasis on all agrochemical sellers to be trained to be good educators for farmers. These data supports the findings by Lamontagne-Godwin and Taylor (2013), who indicated that agro-dealers are the primary source for farmer advice on crops with health problems. However, most agro-dealers have little practical information on dealing with plant health problems or on interacting with farmers.

The findings show that male farmers, as compared to women, are the ones most likely to attend extension training programs in the study area. This finding is supported by the study by Abdullahi and Stigter (2007). These authors pointed out that most of the on-farm and off-farm activities were carried out by women, but socioeconomic and cultural barriers hindered their access to extension services. Various studies have shown that, in most developing countries, women are the ones performing most (70%) of the agricultural activities, especially in rural small-scale households (Federal Ministry for Economic Cooperation and Development, 2013; Jiggins, Samanta, & Olawoye, 1997; Vargas-Lundius, 2009). Additionally, Jiggins et al. (1997) asserted that the reason for this that women have many daily activities related to family issues. This finding concurs with a study conducted in Nigeria that indicated agricultural extension services did not put much emphasis on reaching

women because there is an assumption that women only play a supportive role (Samanta, 1994, as cited in Jiggins et al., 1997).

As stated in the conceptual framework portion of this study, peoples' perceptions can be shaped by their experience as well as trainings (Leeper, 1935). Therefore, the rest of this chapter is divided into sections to discuss farmers' perceptions of extension education as well as other factors pertaining to farmers' participation and preferences in agricultural extension training programs.

### **Farmers' Awareness of Extension Services**

To determine farmers' perceptions regarding extension services, first their awareness of the issue had to be identified. The study revealed that most farmers (85%) knew the extension agent in the area; however, in some cases further translation had to be made because the extension agent is known by different names or titles depending on the location. In many places visited, farmers refer to an extension agent as a livestock officer. This was due to the fact that most extension agents have been more focused on dealing with livestock as compared to crops. This finding is related to farmers' awareness of the meaning of the word extension. Many farmers (50.8%) seemed not to understand the meaning of the word, though when explained to them most of them seemed to be aware. This observation is supported by the study by Ayele (1982), who commented that extension agents are known by different titles in different parts of the country.

### **Participation in Extension Training Programs**

Most farmers in this study (78.3%) reported that they did not belong to any farmer group. This finding explains the reason given by many farmers that they didn't attend training because they did not get information about the training programs being offered. Due to this situation, it is difficult to coordinate trainings and disseminate information to farmers about

training programs. There is a shortage of extension agents in the country (Isinika Ngetti, Kimbi, & Rwambali, 2005; Rutatora & Mattee, 2001). It becomes easier to disseminate information to farmers through farmer groups, as the farmers know each other and, hence, it is easier to pass information around among themselves. As pointed out by Abdullahi and Stigter (2007), farmer groups are informally referred to as self-help groups. Through such groups, farmers are empowered and help to improve their knowledge-sharing ability on various issues related to production (Vargas-Lundius, 2009). Osei (n.d.) insisted on the importance of farmer groups, stating that creation of small farmer groups is very important in enabling the distribution of agricultural technologies through extension services, especially for small-scale farmers. Additionally, studies by Davis (2008); Place et al. (2002); and Stringfellow, Coulter, Lucey, McKone, & Hussain (1997) also emphasized the importance of farmer groups, stating that they are very important in helping farmers have access to extension services, especially in rural areas.

The reason for a lack of small farmer groups created by public extension agents is that many of them were not properly trained on the theories and principles of group formation or on participatory extension (Abdullahi & Stigter, 2007). Furthermore, Abdullahi and Stigter (2007) pointed out that this trend is also the result of a poor level of investment in agricultural extension services. This has caused a difficult working environment for extension agents and a failure to perform their duties effectively due to poor motivation.

### **Factors Influencing Farmers' Participation in Extension Education Programs**

In this study, farmers identified factors that motivated them to participate in extension education training provided in their area as well as reasons for those who did not attend training. Regarding motivation for participation, most farmers mentioned economics, such as learning new ways of farming to get higher production as well as knowing more about input

subsidies and proper input usage for more farm profit, as the reason that motivated them to take part in extension training programs. This is supported by adult learner characteristics that they are more motivated to learn what has immediate application in their life (Knowles, 1980). Additionally, some farmers were encouraged to attend training programs just because their friends were aware of the training programs and convinced them to do so. Again, this emphasizes the importance of having small farmer groups. These groups can help increase the number of farmers attending training programs as it is easier for them to spread information about the training among themselves (Vargas-Lundius, 2009).

Furthermore, most of those who hadn't attended training programs mentioned that the reason for not attending extension training programs was the lack of information about the training. This finding is best supported by the study conducted by Davis et al. (2010) who found that the reasons for farmers not to join extension trainings included lack of time and lack of information.

### **Farmers' Perceptions Regarding Extension Services Provided**

Farmers in the study area were asked to rate their perceived usefulness of extension services offered in their area. The Likert-type scale for responses ranged from 1 (*very useful*) to 5 (*not useful*), and 29.2% of responders rated it as 1 and another 44.2% rated it as 2. As the results indicate, many farmers were aware that extension services are useful in helping to improve productivity. As explained by Swanson (2004), agricultural extension services are meant to help people through educational procedures to improve farming methods and techniques and to improve their social and educational standard of rural life. This is supported by a study by Due, Magayane, and Temu (1997), who commented that many farmers understand the importance of agricultural extension services whether or not they have ever been exposed to extension services. Knowing this, 43.3% ( $n = 52$ ) of the farmers

interviewed for the study declared that extension services are effective in helping farmers to improve production, whereas most of the farmers (55.0%,  $n = 66$ ) complained that it is ineffective in helping farmers to improve their production. Most farmers complained that most village extension agents pay more attention to livestock because, if they attend to a farmer with livestock-related problems, they get paid, which is not the case for crops. This is supported by a study by Anderson and Feder (2004), who explained that the fee-for-service approach increases the effectiveness of extension agents in serving farmers. However, the weakness of such system is that, in most developing countries like Tanzania, farmers may be stratified due to economic differences.

Despite the fact that many farmers interviewed agreed that extension is useful for them to improve their production, many (51.7%,  $n = 62$ ) disagreed with the point that the extension service offers what they really need. Yet, other farmers (35.8%,  $n = 43$ ) said they didn't know. This is mainly attributed to the fact that most of the extension education programs were not prepared using a participatory approach (Rutatora & Mattee, 2001). This finding is supported by the study conducted by Isinika (2000), who stated that most extension agents lack participatory problem-solving skills. There is a lack of farmer involvement in decision making about the programs to be implemented in their areas, leading to poor participation in such programs (Glendenning et al., 2010).

Regarding the role of government, many farmers (77.5%,  $n = 93$ ) disagreed with the statement that government plays a role in helping farmers through extension services. This finding is in line with several studies that mentioned the inadequacy of government support for extension services in Tanzania (Churi et al. 2012; Mattee, 1994; Mvuna, 2010; MAFC, 2007; Wambura et al., 2012). Farmers interviewed for the present study also mentioned

factors such as lack of transportation for extension agents, lack of quality housing for extension agents, as well as a lack of training facilities for extension agents. These findings seem to be the case for many developing countries as pointed out by Tladi-Sekgwama and Tselaesele (2010) in their study conducted in Botswana.

Generally speaking, farmers understand the importance of extension education programs in helping them to improve production, but they are not satisfied with the way it is being implemented and with the little attention paid by the government to help the extension system.

### **Sources of Agricultural Information and Delivery Methods**

From the study, the largest group of farmers interviewed commented that they get information through friends (39.2%,  $n = 47$ ) and a slightly smaller group (35.8%,  $n = 43$ ) said they receive information through village/farmer meetings, whereas 14.2% ( $n = 17$ ) of the participants said they get most of the agricultural related information through media, especially radio. Although these are the ways in which many farmers received information regarding agricultural information, most of them suggested that the best way would be the village office notice board, as it is even easier for their children to see the information and deliver it to them. The findings from this study are supported by the study conducted by Churi et al. (2012), who mentioned that many farmers obtain information about their production through radio and village meetings. This is further supported by Gautam (2000), who added that hearing information on the radio helps encourage farmers to look for more detailed agricultural information from extension agents in their area. The limitation of this method for many farmers in the study area is that they seem not to allocate time for listening to agricultural related radio programs, as they receive only one radio station and the



agricultural related program is in the morning, a time when most of them are busy on their farms.

Obtaining information from fellow farmers (friends) was also in line with findings in the study conducted by Churi et al. (2012), who claimed that sharing of agricultural information among farmers has remained the main method in many rural communities. But they also cautioned that this method is not effective due to inadequate information and experience shared. Churi et al. also commented that there is an increased use of cellphones among farmers in rural areas due to increased network coverage as well as due to the decrease in prices for mobile services.

As shown in Table 13, most farmers (85%,  $n = 102$ ) indicated that they preferred learning by doing in which they used hands-on activities and practices. This finding is supported by the characteristics of adult learners: learners are problem centered and prefer to incorporate their experience as well (Knowles, 1980). This aspect is also supported by the findings of Johnstone and Rivera (1965, as cited in Dollisso & Martin, 1999), which showed that most adult learners prefer practical application of information or skills rather than theories.

### **Sociodemographic Factors in Relation to Farmers Perceptions of Extension Services**

There was no statistically significant difference on the perceived mean importance of extension services among farmers with different education levels. But descriptive data indicated that many farmers were aware of the usefulness of extension services. This data supports the fact that extension education programs are very useful in helping farmers to improve production. Contrary to this point, most farmers claimed that the ideas of extension education programs are very useful and important given the prevailing changes in the agricultural sector, but the problem is with implementation and the organizational system.

This conclusion concurs with the findings of many studies conducted on extension that the low agricultural and livestock production is due to inadequate extension system (MAFC, 2007; Churi et al., 2012; Mattee, 1994; Mvuna, 2010; Wambura et al., 2012). Other factors, such as poor organizational structure, poor administration structure, lack of participatory methods, and untimely provision of extension services (Campbell, 1999; Rutatora & Mattee, 2001; Swanson & Samy, 2003), are among the factors that make farmers develop a negative perception of extension services, regardless of their demographic characteristics.

## **CHAPTER 6. SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS**

### **Summary**

Improvement of agricultural production depends on farmers' access and willingness to use new technologies through extension services (Directorate of Agricultural Extension Services, 2010). Also, as pointed out by Kimaro et al. (2010), extension programs should aim to empower farmers and enable them to identify and analyze their agricultural problems and be able to make the right decisions. Thus, it is important to know the perceptions that farmers have of extension services. The aim of this study was to determine farmers' perception of extension services and how the perceptions impacted farmers' participation in extension education programs. The study was conducted in Kilolo district in the Iringa region located in the southern highlands of Tanzania. The study involved 120 farmers (60% male and 40% female) randomly selected from 12 villages in the Kilolo district. The data were obtained using a structured questionnaire used in interviewing the selected farmers in their homes or fields. The study had five main objectives, which were:

1. Identify farmers' general perceptions about agricultural extension training programs,
2. Identify the extent to which farmers participate in agricultural extension education training programs,
3. Identify preferred methods for delivering agricultural extension training programs,
4. Identify factors that influence farmer participation in agricultural extension education training programs, and
5. Identify selected demographic data and analyze comparisons among the variables.

The study did not find any significant difference between different demographic characteristics, which implies that almost all groups of farmers interviewed had negative perceptions of extension services in the study area. As commented by Ayele (1982), the role of extension agents is affected mainly by the characteristics of their employing agency as well as the clientele whom they serve. Given the findings in this study, the government does not play a supportive role toward extension services, which has accelerated the low performance of extension agents and, hence, has led to negative perceptions among farmers. As indicated in Table 10, 77.5% of the participants interviewed declared that the government did not play a positive role in helping farmers through extension services. This justifies the explanations given in the literature review of this study that there is an inadequate extension system in Tanzania, which leads to ineffective dissemination of agricultural technologies (MAFC, 2007; Churi et al., 2012; Mattee, 1994; Mvuna, 2010; Wambura et al., 2012). From the findings of this study, this can be attributed to the fact that all groups of farmers had a negative perception of the extension system. Also, the government has not played its role to support extension services by motivating extension agents and, as a result, most extension agents have not been active in performing their roles of serving farmers at their work stations.

The study also determined that most farmers (85%,  $n = 102$ ) preferred learning by doing through hands-on activities. This is supported by the fact that most farmers are adults and, hence, they possess that adult characteristic of learning, as pointed out by Knowles (1980). Johnstone and Rivera (1965, as cited in Dollisso & Martin, 1999) also supported the finding that adults prefer practical application instead of theories.

Due to the negative perceptions that many farmers had, it was difficult for them to communicate with an extension agent. Because of this, over one third of the farmers (37.5%,  $n = 45$ ) had never tried to find an extension agent for help in their fields. Furthermore, the study determined that many farmers (40.8%,  $n = 49$ ) did not communicate with an extension agent because the agent did not visit their areas.

The study also indicated that there is poor participation in extension training programs among farmers. This is due to the fact that there is a lack of the use of participatory methods as well as a lack of small farmer groups. According to Abdullahi and Stigter (2007), this is caused by the lack of proper knowledge about the principles of group formation and participatory extension among extension agents, which is the result of a low investment level in agricultural extension services in most developing countries. As indicated in Table 7, a large percentage of the participants (78.3%) did not belong to any farmer group. Additionally, almost half (49.2%) of the participants did not attend any extension training program every year. The reason given by most of them (51.7%) was lack of information about the training programs conducted in their areas. Again, this was caused by the lack of small farmer groups in which farmers would be able to share such information among themselves, as it is difficult for an extension agent to visit each farmer and deliver information about the training programs (Davis, 2008; Place et al., 2002; Stringfellow et al., 1997).

Many farmers interviewed declared that the factor that motivated them to participate in extension programs was the desire to get new technologies to help them improve production. As pointed out by the Directorate of Agricultural Extension Services (2010),

agricultural extension should play a pivotal role to ensure that farmers have access to improved technologies, which in turn helps farmers improve their production.

From this study, it is advised that government should play a pivotal role in supporting the extension system. It should ensure that extension agents are well motivated by providing them with all necessary materials such as housing, transportation, good salaries, and training materials. This should go along with establishing a well-coordinated system that will ensure that extension agents perform their duties effectively. In so doing, farmers will be well treated by extension agents. This may help to develop positive attitude among farmers, and hence, effective extension services leading to improved agricultural production among farmers.

### **Conclusions**

As explained in the introduction of this study, it can be concluded that the negative perception that farmers have about the implementation of extension services in their localities leads to poor attendance and, hence, poor production. Additionally, most farmers aim to increase their production through the use of new ways of farming. As many studies have indicated, farmers prefer to learn through hands-on activities. The following are the general conclusions for this study;

1. In general farmers appeared not to be satisfied with the current extension services provided.
2. When well engaged and planned, farmers tend to like extension-training programs.
3. Participatory model of delivering extension-training programs is not well practiced in Tanzania.
4. Furthermore, from the study it can be concluded that farmers are not satisfied with the support that government has to extension services in Tanzania.

5. Also the study concluded that, there are no known schedules for providing extension-training programs among farmers in Tanzania. And farmers are rarely receiving extension-training programs regarding crops they produce.
6. Additionally, the study concluded that there is poor communication between the extension agent and farmers, this leads to lack of information about the extension training programs in the area and hence poor attendance leading to ineffective dissemination of agricultural technologies.
7. Also the lack of small farmer groups is another factor that leads to poor participation in extension training programs as it become difficult to mobilize farmers to take part in extension training programs.
8. It can also be concluded that there is a weak evaluation system of the extension services offered to farmers in the villages.
9. Generally, most farmers understand the usefulness of extension training programs in improving their agricultural production, there is a great need to improve the way services are offered as well as the dissemination of information about training to capture the attention of many farmers regarding the training to be conducted.

### **Recommendations**

The following are program recommendations based on the findings and conclusions of this study:

1. In most cases farmers claim that they fail to consult extension agents because extension agents are not experienced enough to help them. This decreases the trust among farmers toward extension agents and, hence, increases the negative perception of extension service in general and poor attendance. Based on farmers'

advice, the government should provide frequent in-service training and orientation of newly employed extension agents based on the types of crops being produced in their assigned workstations.

2. Where extension agents are livestock professionals, there is a great need to employ other extension agents with expertise in crops. In the areas where they are employed to cater to both crop and livestock production, there is a need to put more emphasis through evaluation to ensure that they offer equal opportunities to both livestock and crop producers. The extension system should provide a livestock and/or a crop specialist in areas where they are needed.
3. As indicated by this study's findings, in most cases there is no known schedule for training. The recommendation put forward is that extension agents should have a known schedule for training so as to help farmers allocate time for such training. This will help to alert farmers of the trainings coming up, instead of bringing it to them as an urgent situation. The extension system should provide and distribute a list of events or training programs well in advance to assist farmers in participating in training programs.
4. Effective collaboration is recommended between public extension services and the private/NGO-based extension system. As cited in this study, most private-based extension services are more advanced, but they cannot cover large areas due to funding problems. To overcome some weaknesses that are evidenced in public-based extension, working in collaboration with the NGO-based system might be the solution. Therefore, it is recommended that public- and private-based extension service entities should organize and deliver programs through collaborative efforts.



5. Emphasis should be placed on the creation of small farmer groups in which training can be easily conducted. This would also help in the dissemination and sharing of necessary information among farmers. This approach would help to minimize extension agents' tasks, such as visiting each farmer to give information about training programs. In addition, this approach would help to strengthen the decision-making abilities of farmers and, hence, increase the participation rate in extension education programs being conducted. Therefore, the extension system should organize small groups of farmers and help serve their needs.
6. There is a need for the government to enforce laws that agrochemical sellers should have some level of education, which will enable them to give advice to farmers accordingly. This is because there is large number of farmers needing technical advice from agro-dealers when they encounter problems with their livestock or crops. The government should certify agro-chemical sellers to make sure they are well educated about their products.
7. Finally, extension program planners should focus on current problems facing farmers and provide technology and knowledge that are of interest to farmers. This can best be done by employing a participatory approach to extension as well as by strengthening collaboration between extension and research so as to be able to update farmers on any new innovations.

### **Recommendations for Further Studies**

1. Because farmers require extension agents with experience, there is a need for frequent in-service training for extension agents so as to keep them updated with the prevailing changes in the agricultural sector. This call for further studies on training

need requirements among extension agents and how best the training can be done to help farmers.

2. Furthermore, there is a need to review the monitoring and evaluation system as well as the division of work among extension agents. This calls for further studies on what can be done to improve the work efficiency of extension agents and on identifying their preferences for better performance.
3. Based on the fact that most extension agents do not conduct frequent training programs, and many farmers claim not to be visited by them, there is also a great need to conduct research on the perceptions of extension agents regarding their work environment. Through this, further recommendations can be made to help improve their work environment and, hence, improve their performance in educating farmers. This also will help to identify the challenges extension agents face in the field as well as how they think these challenges can be tackled.
4. Finally, using the same procedure in this study, it is recommended that a similar study on a larger population be conducted so as to increase the reliability and hence the generalizability of the findings.

### **Implications**

As stated in the conceptual framework of this study, perceptions are shaped through 'individuals' experience and training (Leeper, 1935). This implies that there is a need for farmers' to be well oriented with regard to the system, as most of them understand that extension services are useful. Therefore, efforts should be made to improve extension services and change the farmer's mindset as to how extension is being conducted. Also, because perceptions guide adoption among people, there is an implication that, due to

negative perceptions many farmers have regarding extension services, there may be a decrease in the adoption rate of new technologies presented to them.

The findings from this study may play a big role in helping to improve the effectiveness of the extension education system in Tanzania, as it may be used in the planning of the extension education programs. The findings revealed farmers' perceptions and views of how extension services were being conducted in their area. As explained in the literature review, farmers' perceptions have an impact on participation as well as on adoption of new technologies.

## Conceptual framework

Based on the findings from this study, below is the conceptual framework that can be used to improve the dissemination of agricultural technologies in Tanzania through extension training programs.

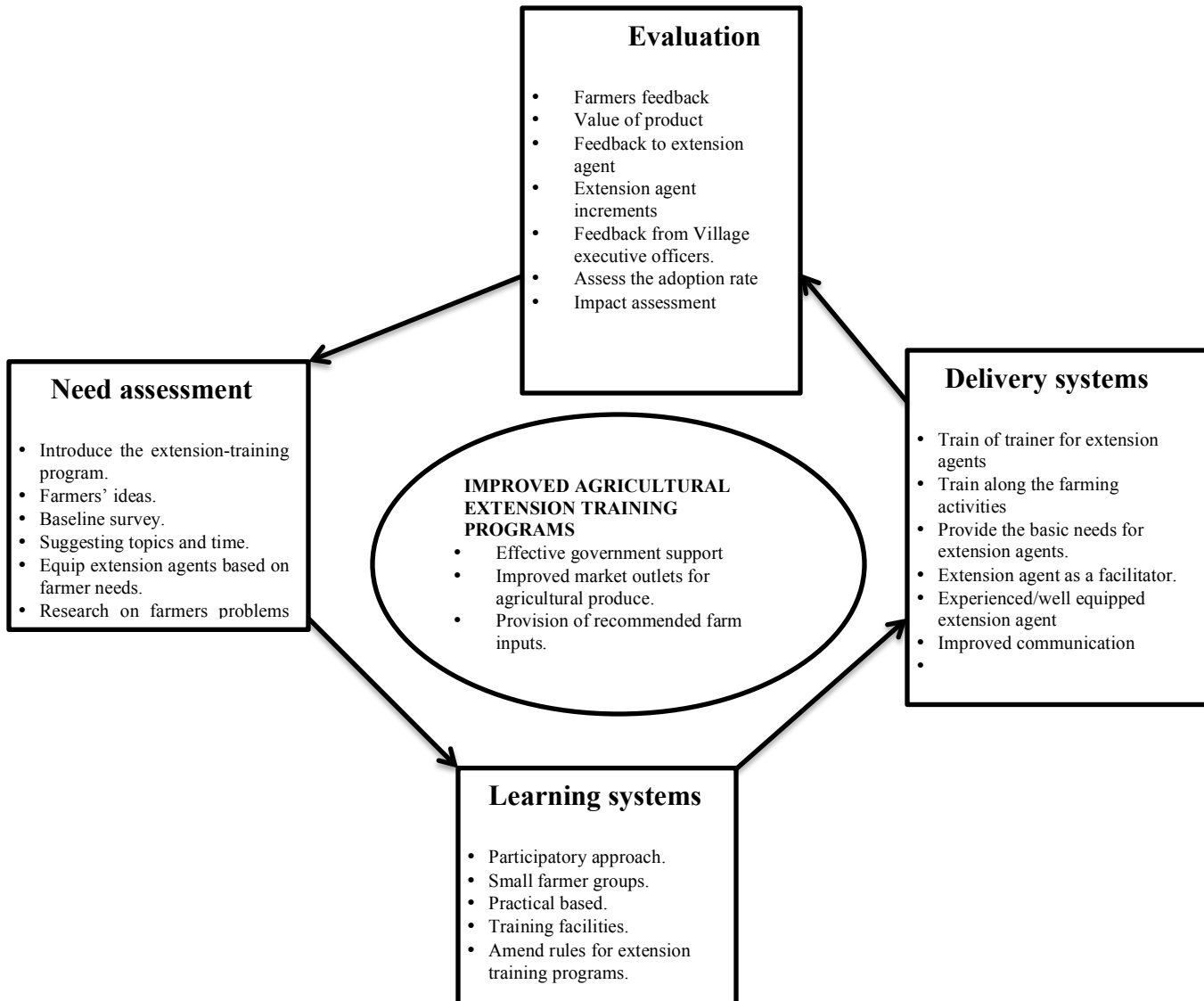


Figure 2: Conceptual framework based on implications.

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**APPENDIX A. INTERVIEW QUESTIONNAIRE****Alunas Maxwell Mwamakimbula****Assessment of the Factors Impacting Agricultural Extension Training Programs in Tanzania -A Descriptive Survey****Research Questionnaire****I. Awareness on Extension Services**

1. What is your understanding of the term extension?
  - A. I have no idea what extension is.
  - B. I have some understanding about extension.
  - C. I understand very well what extension is.
  
2. Do you know the extension agent in your area?
  - A. Yes
  - B. No
  
3. Have you ever attended an extension educational program in your area? (If no skip question number 9)
  - A. Yes
  - B. No
  
4. Do you belong to any farmers' group in your area?
  - A. Yes
  - B. No
  
5. Do you know where you can get farm assistance/advice about your crops and livestock in your village/area
  - A. Yes
  - B. No
  
6. If the answer is yes, on question 5 above, please specify where you can get assistance about your crops and livestock \_\_\_\_\_
  
7. Who attends the extension education program in your family?
  - A. Father
  - B. Mother
  - C. Both (A & B)
  - D. Any member of the family
  - E. All members of the family
  
  - F. Alternate (one at a time)

8. How often do you attend extension education programs in a month?
- A. Once
  - B. Twice
  - C. Thrice
  - D. Other \_\_\_\_\_
9. How did you first hear about extension education training program in your area?
- A. Through village meetings
  - B. Visited at home by extension agent
  - C. Visited at home by farmer leader
  - D. Through media
  - E. From a friend
  - F. Other \_\_\_\_\_

## II. Farmers Perception of Extension Services

10. How useful are the extension education program you have attended?
- A. Very Useful
  - B. Useful
  - C. I don't know
  - D. Somehow useful
  - E. Not useful
11. The extension agent provides good ideas that help me in improving my crop and livestock production.
- A. Strongly agree
  - B. Agree
  - C. I don't know
  - D. Disagree
  - E. Strongly disagree
12. The extension agent is readily available (can easily be reached) to help me.
- A. Strongly agree
  - B. Agree
  - C. I don't know
  - D. Disagree
  - E. Strongly disagree
13. The training is provided at times when we can apply it in the field.
- A. Strongly agree
  - B. Agree
  - C. I don't know
  - D. Disagree
  - E. Strongly disagree

14. The extension agent is usually well prepared during extension training program
- A. Strongly agree
  - B. Agree
  - C. I don't know
  - D. Disagree
  - E. Strongly disagree
15. The extension agent has training materials (such as facilities for demonstration) needed for the extension education program
- A. Strongly agree
  - B. Agree
  - C. I don't know
  - D. Disagree
  - E. Strongly disagree
16. How would you rate the quality of your extension agent in helping farmers in your area?
- A. Excellent
  - B. Good
  - C. Fair
  - D. Poor
17. The government plays an important role in helping farmers through the extension service.
- A. Strongly agree
  - B. Agree
  - C. I don't know
  - D. Disagree
  - E. Strongly disagree
18. The extension agents are friendly and easily approachable regarding my farm problems?
- A. Strongly agree
  - B. Agree
  - C. I don't know
  - D. Disagree
  - E. Strongly disagree
19. Do you think the extension system (through extension agents) offers what you really need?
- A. Strongly agree
  - B. Agree
  - C. Don't know
  - D. Disagree
  - E. Strongly disagree

20. Would you encourage one of your friends to attend an extension education program in your area? (Give a reason for your response)

A. Yes

B. No

Reason: -----  
-----

21. Generally how would you rate the extension program in your area in helping to improve farmers' well being through agricultural production?

A. Very effective

B. Effective

C. Fair

D. Less effective

### III. Motivational Factors for Participation

22. If you have not participated in an extension education program, indicate the reason.

A. Did not know about where they are conducted

B. Did not know when they are conducted

C. They are conducted far from my place

D. Training given is not of my interest

E. They are held at a time when I have other obligations (inconvenience)

F. Other-----

23. If you have ever participated in an extension education program, indicate the reason you were intended for attending.

A. Village policy

B. Desire to get knowledge to apply on my farm

C. Convinced by friend

D. Want to learn new ways of farming

E. Want to get awareness on market issues

F. Be aware of the farm input subsidies in my area

G. Get information on weather alerts for the season

H. Other -----

24. Participating in extension education program helps in improving way of farming/productivity.

A. Strongly agree

B. Agree

C. I don't know

D. Disagree

E. Strongly disagree

25. Participating in extension education program helps to increase my income from the farm.
- A. Strongly agree
  - B. Agree
  - C. Don't know
  - D. Disagree
  - E. Strongly disagree
26. Lessons taught can easily be applied in my daily field activities.
- A. Strongly agree
  - B. Agree
  - C. Don't know
  - D. Disagree
  - E. Strongly disagree
27. I like to attend the extension education program because the extension agent provides continuous support to help me apply and implement the information that was taught.
- A. Strongly agree
  - B. Agree
  - C. Don't know
  - D. Disagree
  - E. Strongly disagree
28. Do you believe that extension agents help farmers to improve their production/yield?
- A. Yes
  - B. No

#### IV. Delivery System Preference

29. What is your preferred method of teaching?
- A. Demonstration with hands on experience
  - B. Group discussion and group activities
  - C. Individual visits
  - D. Problem solving activities
  - E. Lecture
  - F. Other-----
30. Which extension approach do you like the most?
- A. Farmer Field School (FFS)
  - B. Training and visit
  - C. Farmer to farmer
  - D. Contract farming
  - E. Other-----



31. What is your preferred way of getting agricultural information regarding the crops and livestock that you produce,
- A. Through media (radio, television, newspaper)
  - B. Through phone
  - C. Through extension farmers meetings
  - D. From friends
  - E. Other -----
32. Have you had a chance to give feedback to an extension agent about the delivery of extension education program?
- A. Yes
  - B. No
33. How have you benefited from the extension training you have attended? -----  
-----
34. What advice would you give to improve the training and delivery of the extension education program? -----  
-----
35. What factors hinder communicating with extension agents in your area?
- A. Difficult to find in the office
  - B. Lives out of the village
  - C. Has many appointments to make
  - D. I don't have a phone to call
  - E. Doesn't visit my area regularly
  - F. I have never tried to find him/her in person
  - G. Other-----

#### V. Social Demographic Features

36. Gender
- A. Male
  - B. Female
37. Marital status
- A. Single
  - B. Married
  - C. Divorced
  - D. Widow

38. What is your formal educational level?
- A. Never been to school
  - B. Standard four
  - C. Standard seven
  - D. Form four
  - E. Form six
  - F. Diploma
  - G. Degree
  - H. Masters
39. How old are you?
- A. 18-25 years
  - B. 26-35 years
  - C. 36-45 years
  - D. 46-50 years
  - E. 51-55 years
  - F. 56-60 years
  - G. Above 60 years
40. How large is your farm?
- A. Less than 2 acres
  - B. 2-5 acres
  - C. 6-10 acres
  - D. 11-20 acres
  - E. More than 20 acres
  - F. Other -----
41. What crops do you grow? \_\_\_\_\_
42. What animals do you manage on your farm?
- A. Cows
  - B. Goats
  - C. Pigs
  - D. Chickens
  - E. Sheep
  - F. Ducks
  - G. Other -----
43. Where did you originally come from?
- A. Native of this village
  - B. Migrated to this village

## Questionnaire (Swahili Version)

### Dodoso la Mkulima

#### I. Ufahamu Juu ya Huduma za Ugani

1. Unaelewa nini kuhusu ugani? ( kama haelewi mueleweshe)
  - A. Sina uelewa juu ya neno hili.
  - B. Nina uelewa kiasi juu ya neno hili
  - C. Ninaelewa vizuri kuhusu ugani
  
2. Unamfahamu afisa ugani (bwana shamba) katika eneo lako?
  - A. Ndio
  - B. Hapana
  
3. Umewahi kuhudhuria mafunzo ya kilimo kaitika eneo lako? (kama hapana, ruka swali la 9)
  - A. Ndio
  - B. Hapana
  
4. Je, wewe ni mwanachama katika kikundi chochote cha wakulima?
  - A. Ndio
  - B. Hapana
  
5. Je, unafahamu wapi unaweza kupata msaada wa ushauri kuhusu kuboresha mazao na mifugo yako katika eneo lako?
  - A. Ndio
  - B. Hapana
  
6. Kama jibu ni ndio (swali la 5) tafadhali taja mahali unapoweza kupata msaada wa kitaalamu kuhusu mazao na mifugo yako. \_\_\_\_\_
  
7. Ni nani huwa anahudhuria mafunzo ya Kilimo katika familia?
  - A. Mama
  - B. Baba
  - C. Baba na mama
  - D. Yeyote katika familia
  - E. Wote
  - F. Tunahudhuria kwa zamu
  
8. Unahudhuria mafunzo ya kilimo mara ngapi kwa mwezi?
  - A. Mara moja
  - B. Mara mbili
  - C. Mara tatu
  - D. Nyingine \_\_\_\_\_

9. Ulipataje taarifa juu ya mafunzo ya kilimo katika eneo lako kwa mara ya kwanza?
- Kupitia mkutano wa kijiji
  - Nilitembelewa na bwana shamba nyumbani
  - Nilitembelewa na mkulima kiongozi nyumbani
  - Kupitia vyombo vya habari( mfano: redio, magazeti na luninga)
  - Kutoka kwa rafiki /jirani
  - Wengine \_\_\_\_\_

## II. Mtazamo wa Wakulima Juu ya Huduma za Ugani

10. Je mafunzo ya Kilimo uliyowahi kuhudhuria yana umuhimu kiasi gani katika kuongeza uzalishaji?
- Muhimu sana
  - Muhimu
  - Sijui
  - Muhimu kiasi
  - Sio muhimu
11. Afisa Kilimo (bwana shamba) anatoa ushauri unaonisaidia kuboresha uzalishaji wa mazao na mifugo yangu.
- Nakubaliana kabisa
  - Nakubaliana
  - Sijui
  - Sikubaliani
  - Sikubaliani kabisa
12. Afisa Kilimo (bwana shamba) anapatikana kunisaidia nikiwa nahitaji ushauri wake.
- Nakubaliana kabisa
  - Nakubaliana
  - Sijui
  - Sikubaliani
  - Sikubaliani kabisa
13. Mafunzo yanatolewa wakati ambapo naweza kuyatumia moja kwa moja shambani.
- Nakubaliana kabisa
  - Nakubaliana
  - Sijui
  - Sikubaliani
  - Sikubaliani kabisa
14. Kwa kawaida, afisa Kilimo (bwana shamba) huwa anajiandaa vizuri wakati wa kutoa mafunzo kwa wakulima.
- Nakubaliana kabisa
  - Nakubaliana
  - Sijui
  - Sikubaliani
  - Sikubaliani kabisa

15. Afisa Kilimo huwa anakua na vifaa vyote vinavyohitajika wakati wa kufundisha.
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa
16. Unazungumziaje ufanisi wa bwana shamba kuwasaidia wakulima katika eneo lako?
- A. Mzuri sana
  - B. Mzuri
  - C. Kawaida
  - D. Mbaya
17. Serikali inafanya juhudi kubwa kuwasaidia wakulima kupitia huduma za ugani( kupitia kwa bwana shamba).
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa
18. Ninapokua na tatizo shambani bwana shamba yuko tayari kusikiliza na kunisaidia ipasavyo.
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa
19. Unadhani, huduma za ugani katika eneo lako zinatoa huduma unazozihitaji?
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa
20. Je, utamshauri rafiki au jirani yako kuhudhuria mafuzo ya Kilimo katika eneo lako? (toa sababu ya jibu lako)
- A. Ndio
  - B. Hapana
- Sababu: -----  
-----
21. Kwa ujumla, unazungumziaje ufanisi wa huduma za ugani katika eneo lako kuwasaidia wakulima kuinua kipato chao kupitia kilimo?

- A. Mzuri sana
- B. Mzuri
- C. Wastani
- D. Sio mzuri

### III. Sababu za Ushiriki Katika Mafunzo ya Kilimo

22. Kama hujawahi kuhudhuria mafunzo ya kilimo katika eno lako, tafadhali toa sababu.
- A. Sijui ni mahali mafunzo yanapofanyikia
  - B. Sijui muda ambapo mafunzo yanafanyika
  - C. Yanafanyika mbali na ninapoishi
  - D. Mafunzo yanayotolewa sio ninayoyataka
  - E. Mafunzo yanafanyika muda ambao ninakua na majukumu mengine
  - F. Mengineyo \_\_\_\_\_
23. Kama umewahi kushiriki kwenye mafunzo ya kilimo katika eneo lako, elezea sababu iliyokusukuma kuhudhuria.
- A. Sheria ya kijiji kwamba ni lazima kila mwanakijiji ahudhurie
  - B. Nilitamani kupata mbinu za kuboresha shamba langu.
  - C. Nilishawishiwa na rafiki
  - D. Nilihitaji kujifunza njia mpya za uzalishaji
  - E. Nilihitaji kupata taarifa kuhusiana na masoko ya mazao yangu.
  - F. Nilihitaji kujua kuhusu pembejeo za ruzuku katika eneo langu
  - G. Kupata taarifa kuhusuiana na hali ya hewa na jinsi itakavyoathiri mazao.
  - H. Mengineyo \_\_\_\_\_
24. Ushiriki katika mafunzo ya kilimo husaidia kuboresha uzalishaji wa mazao yangu
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa
25. Ushiriki katika mafunzo ya Kilimo husaidia kuongeza kipato changu kupitia shambanani
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa
26. Mafunzo yanayotolewa naweza kuyatumia shambani kwangu kirahisi.
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa

27. Napenda kuhudhuria mafunzo ya kilimo kwasababu afisa kilimo (Bwana shamba) anatoa huduma endelevu na kunisaidia kutumia mafunzo anayotoa na kunisaidia kila mara ninapokwama.
- A. Nakubaliana kabisa
  - B. Nakubaliana
  - C. Sijui
  - D. Sikubaliani
  - E. Sikubaliani kabisa
28. Unafikiri maafisa kilimo wanawasaidia wakulima kuongeza uzalishaji wa mazao yao?
- A. Ndio
  - B. Hapana
  - C. Sijui

#### IV. Njia za Kufundishia

29. Unapendelea njia gani ya kufundishiwa?
- A. Kuoneshwa na kufanya kwa vitendo
  - B. Mijadala na shughuli kwenye vikundi
  - C. Kutembelewa peke yako
  - D. Kutatua matatizo mbalimbali
  - E. Maelezo
  - F. Nyigine \_\_\_\_\_
30. Ni njia ipi ya ugani unaipenda zaidi?
- A. Shamba darasa
  - B. Training and visit(kutembelewa na mtaalam)
  - C. Mkulima kwa mkulima
  - D. Kilimo cha mkataba
  - E. Nyingine \_\_\_\_\_
31. Ni njia ipi unapendelea kupata taarifa zinazohusiana na mazao na mifugo unayozalisha?
- A. Kupitia vyombo vya habari (redio, luninga, magazeti)
  - B. Kupitia simu
  - C. Kupitia mikutano ya Kilimo
  - D. Kutoka kwa rafiki
  - E. Nyingine \_\_\_\_\_
32. Umewahi kupata nafasi ya kutoa mrejesho kuhusu mafunzo yanayotolewa katika eneo lako kwa Bwana shamba?
- A. Ndio
  - B. Hapana

33. Umefaidikaje na mafunzo ya kilimo uliyowahi kuhudhuria?

---



---

34. Una ushauri gani kuhusu kuboresha huduma za ugani katika eneo lako?

---



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35. Ni vitu gani vinakuzuia(vikwazo) kuwasiliana na afisa Kilimo(bwana shamba) katika eneo lako?

- A. Ni vigumu kumkuta ofisini
- B. Anaishi nje ya kijiji
- C. Ana watu wengi wa kuonana nae
- D. Sina simu ya kumpigia
- E. Hatembelei eneo langu mara kwa mara
- F. Sijawahi kumtafuta
- G. Sababu nyingine \_\_\_\_\_

#### V. Utambulisho

36. Jinsia yako

- A. Mwanaume
- B. Mwanamke

37. Mahusiano

- A. Mseja
- B. Nipo kwenye ndoa
- C. Tumeachana
- D. Mjane/Mgane

38. Elimu yako.

- A. Sijasoma kabisa
- B. Darasa la nne
- C. Darasa la saba
- D. Kidato cha nne
- E. Kidato cha sita
- F. Diploma
- G. Chuo kikuu
- H. Shahada ya uzamili

39. Una miaka mingapi

- A. Miaka kati ya 18-25
- B. Miaka kati ya 26-35
- C. Miaka kati ya 36-45
- D. Miaka kati ya 46-50
- E. Miaka kati ya 51-55



- H. Miaka kati ya 56-60
- I. Zaidi ya miaka 60

40. Shamba lako lina ukubwa gani?

- G. Chini ya ekari 2
- H. Ekari 2-5
- I. Ekari 5-10
- J. Ekari 10-20
- K. Zaidi ya ekari 20
- L. Nyingine \_\_\_\_\_

41. Unalima mazao gani? \_\_\_\_\_

42. Unafuga wanyama gani?

- H. N'gombe
- I. Mbuzi
- J. Nguruwe
- K. Kuku
- L. Kondoo
- M. Bata
- N. Wengine \_\_\_\_\_

43. Asili yako

- C. Mzawa wa kijiji hiki
- D. Nimehamia

## APPENDIX B. INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

IOWA STATE UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

Institutional Review Board  
Office for Responsible Research  
Vice President for Research  
1138 Pearson Hall  
Ames, Iowa 50011-2207  
515 294-4566  
FAX 515 294-4267

**Date:** 7/18/2013

**To:** Alunas Maxwell Mwamakimbula  
2623 Somerset Dr  
Ames, IA 50010

**CC:** Dr. Robert Martin  
201 Curtiss Hall

**From:** Office for Responsible Research

**Title:** Assessment of the Factors Impacting Agricultural Extension Training Programs in Tanzania

**IRB ID:** 13-301

**Study Review Date:** 7/18/2013

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
  - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
  - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

**Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form.** A Personnel Change Form may be submitted when the only modification involves changes in study staff. *If it is determined* that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

**Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.**

## APPENDIX C. INTRODUCTION LETTERS

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies  
201 Curtiss Hall  
Ames, Iowa 50011-1050  
Administration and Graduate Programs 515 294-5872  
Undergraduate Programs 515 294-6924  
Extension Programs 515 294-4076  
FAX 515 294-0530

For: To Whom It May Concern

Re: Participant Introductory Statement  
Research Study on Agricultural Extension

The agricultural extension systems that exist in many countries have a long history of serving farmers as they strive to increase crop and livestock production. Extension systems around the world are in constant search for improved production and management practices as well as searching for the best ways to communicate with farmers regarding learning and using these improved practices.

In an effort to discover and use the best practices to deliver educational program training, we are conducting a research study entitled Assessment of Factors Impacting Agricultural Extension Training Programs in Tanzania: A Descriptive Survey. We need your help.

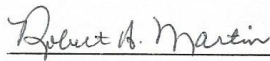
Your participation in the study is very important; therefore, we value your input. You have been randomly selected to participate in this study through an interview. It is important for you to know that your participation in this study is strictly voluntary. Furthermore, you can skip any question that you do not feel comfortable answering. Your responses will be held in strict confidence and only used for group analysis and description. To ensure confidentiality, there is no personal identifying information on the survey form. Each interview will take approximately 30 minutes to complete.

The findings of this study will be used to complete a Master degree in Agricultural Education with a Specialization in Agricultural Extension Education at Iowa State University, U.S.A., in cooperation with Sokoine University of Agriculture (SUA) in Tanzania. This study has been reviewed and approved by the Iowa State University Institutional Review Board for the use of information from human subjects.

We expect that the findings of this study will provide guidelines to identify training priorities and ways to enhance Agricultural Extension programs in Tanzania. The results of this study have the potential of increasing crop and livestock production on farms like yours through improved Extension services. Findings of this study will be shared with all interested individuals who may find the results of the study useful.

If you have any further questions regarding this study, please contact Emmanuel Rwambali at +255784522755 or [rwambali@iagri.org](mailto:rwambali@iagri.org) or Robert A. Martin at [drmartin@iastate.edu](mailto:drmartin@iastate.edu).

Thank you,



Robert A. Martin, Ph.D.  
Major Professor



Alunas Mwamakimbula  
Graduate Student

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

DATE: 8-28-13, Reference Number: 2013

District Executive Director  
Kilolo District Council  
P.O. Box 2324  
Kilolo-Iringa

Department of Agricultural Education and Studies  
201 Curtiss Hall  
Ames, Iowa 50011-1050  
Administration and Graduate Programs 515 294-5872  
Undergraduate Programs 515 294-6924  
Extension Programs 515 294-4076  
FAX 515 294-0530

Re: Letter of Introduction

The purpose of this document is to present a "Letter of Introduction" for your information regarding a research study to be conducted focused on Agricultural Extension Education in selected areas of Tanzania. This study will be conducted on-site by Alunas Mwamakimbula.

The agricultural extension systems that exist in many countries have a long history of serving farmers as they strive to increase crop and livestock production. Extension Systems around the world are in constant search for improved production and management practices as well as searching for the best ways to communicate with farmers regarding learning and using these improved practices.

In an effort to discover and use the best practices to deliver educational program training, we are preparing to conduct a research study entitled Assessment of the Factors Impacting Agricultural Extension Training Programs in Tanzania: A Descriptive Study. We need your help and cooperation.

We propose to randomly select farmers in the Kilolo District, Iringa Region, with whom we will conduct interviews. These interviews will focus on identifying farmer needs and how Agricultural Extension might help farmers improve their way of learning and in turn improve their farming operations.

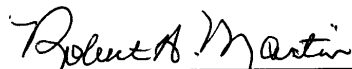
Participation in this study is strictly voluntary. Furthermore, participants can skip any questions they prefer not to answer. Responses to all questions will be held in strict confidence and only used for group analysis. To ensure confidentiality, there will be no personal identifying information on the survey form. Each interview will take approximately 30 minutes to complete.

The findings of this study will be used to complete a Masters degree in Agricultural Education with a Specialization in Agricultural Extension Education at Iowa State University, U.S.A., in cooperation with Sokoine University of Agriculture (SUA) in Tanzania. This study has been reviewed and approved by the Iowa State University Institutional Review Board for use of information from human subjects.

We expect the findings of this study will provide guidelines to identify training practices and ways to enhance Agricultural Extension programs in Tanzania. Findings from the study will be shared with all interested individuals who may find the results of the study useful.

If you have any further questions regarding this study, please contact Emmanuel Rwambali at +255784522755 or [rwambali@iagri.org](mailto:rwambali@iagri.org) or Robert A. Martin at [drmartin@iastate.edu](mailto:drmartin@iastate.edu).

Thank you,

  
Robert A. Martin, Ph.D.  
Major Professor

\_\_\_\_\_  
Alunas Mwamakimbula  
Graduate Student



*Sara A. Lundvall*