

**ANALYSIS OF RELEVANCE AND EFFECTIVENESS OF FTC-BASED
TRAINING: THE CASE OF ALAMATA WOREDA, SOUTHERN
TIGRAY, ETHIOPIA**

M.Sc Thesis

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**ANALYSIS OF RELEVANCE AND EFFECTIVENESS OF FTC-BASED
TRAINING: THE CASE OF ALAMATA WOREDA, SOUTHERN
TIGRAY, ETHIOPIA**

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By

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DEDICATION

I dedicate this thesis manuscript to my mother **Brhana Hailu** for her love and untold-enormous effort in my life and academic success.

STATEMENT OF AUTHOR

First, I declare that this thesis is my original work and all sources of material used for this thesis have been duly acknowledged. This thesis has been submitted in partial fulfillment of the requirements of M.Sc. degree at Haramaya University and is deposited at the University Library to be made available to borrowers under rules of the Library. I also declare that this thesis can be submitted to any other institutions anywhere for the award of any academic degree, diploma, or certificate, if the University found it necessary.

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BIOGRAPHICAL SKETCH

The author was born in 1988 in Asmara capital city of Eritrea, to her mother Brhana Hailu and her father Tekle G\maria. She attended her elementary and junior education at Bethel Kale Hiwot elementary and junior secondary schools in Asmara. She also attended her High-school education at Wukro Comprehensive Secondary School, in Wukro Eastern Zone of Tigray. She joined Haramaya University in 2004\2005 academic year and graduated with B.Sc. degree in Rural Development and Agricultural Extension in July, 2007.

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LIST OF ABBREVIATIONS

AI	Artificial Insemination
ATVET	Agricultural Technical Vocation and Educational Training
AWARD	Alamata Woreda of Agriculture and Rural Development Office
CSA	Central Statistics Authority
CSTC	Community Skills Training Centers
FAL	Functional Adult Learning
FAO	Food and Agricultural Organization
FMPTC	Farmers Multi-purpose Training Center
FTCs	Farmers Training Centers
GOs	Government Organizations
GPA	Grade Point Average
HHs	Households
HRD	Human Resource Development
ICRAF	International center of Rubber Agro forestry
IECAMA	Imperial Ethiopian College of Agriculture and Mechanical Arts
IFAD	International Fund for Agricultural Development
ILRI	International Livestock Research Institute
IPMS	Improving Productivity and Market Success
ITK	Indigenous Technical Knowledge
KMs	Kilo Meters
KAPs	Knowledge, Attitude and Practices
M.a.s.l	Meter above sea level
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Development
MoI	Ministry of Information
MoE	Ministry of Education
NFE	Non-Formal Education
NGO	Non- Governmental Organization
NRM	Natural Resource Management

ABBREVIATIONS (CONTINUED)

PADETES	Participatory Demonstration and Training Extension Systems
PPS	Probability Proportional to the Size
REST	Relief Society of Tigray
RD	Research and Development
RISE	Rural Institute for Social Education
SAILD	Supper Service for Local Development Initiatives in Cameroon
SMSs	Subject Matter Specialists
SPSS	Statistical Package for Social Science
Sq. kms	Square Kilo meters
SWC	Soil Water Conservation
TLU	Total Livestock Unit
TNA	Training Need Assessment
TVET	Technical and Vocational Education and Training
WOALP	Work Oriented Adult Learning Program
WV	World Vision

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ANALYSIS OF RELEVANCE AND EFFECTIVENESS OF FTC-BASED TRAINING: THE CASE OF ALAMATA WOREDA, SOUTHERN TIGRAY, ETHIOPIA

ABSTRACT

FTC-based farmer training is an emerging extension strategy geared towards human capital development through need-based, hands-on practical training in order to facilitate agricultural transformation and rural livelihood improvement. Although FTCs were established and made functional in the Tigray National Regional State and Alamata Woreda no systematic assessment of the relevance and effectiveness of the training were made. Unless the situation of farmers is improved in terms of deciding on their affairs, access to information, exposure to improved farming and practices, all efforts made will be go unrewarding. Hence, to alleviate this problem, educating farmers through basic education intervention and training on improved agricultural and living practices is important. This research was initiated to fill the gap. Specifically the research attempted to address three important questions: What is the relevance and effectiveness of FTC-based training? How do farmers perceive the effectiveness and usefulness of FTC-based training? and Are there FTCs with successful experience for scale-out/up? Primarily quantitative design was employed for the study. The essential data were collected from 65 trained and 65 untrained farmers, 14 DAs and 20 woreda experts by means of semi-structure interview schedule. Qualitative methods that were used at community, organizational and individual levels include: document review, focused/group discussion, personal interviews and direct observation. The quantitative data were also analyzed using descriptive and inferential statistical tools. The results of the study revealed that FTC based training is relevant in terms of timeliness and scheduling specially for male farmers, teaching aids, venue of training, the communication and practical skills of the trainers were also relevant to the farmers. However, FTC based training, lacks training need assessment, less in adequacy and quality of training facilities and being more theoretical and lecture type in methodology, limited use of indigenous knowledge, less female participation and follow up after the training were the major deficiencies. The study also showed that trained farmers acquired better knowledge, aspiration, and practice significantly than untrained farmers. Based on the indicators of positive deviance like, departure from the norms, intentional behavior and honorable outcomes such as technology dissemination, exemplary demonstration field management, diversified and substantial training outreaches of the four sampled FTCs, Selambkalsi FTC is found to be positively deviating. In this research context, positively deviant FTC is the one that performed better than the other FTCs regardless of similar problems and resource base. Therefore, it is recommended that policy aimed at FTC based training in the area could be successful if there is proper training need assessment, increases females participations, gives due focus on practice based training, make uses of indigenous knowledge, regular follow up mechanism and the result of this study are taken in to consideration and there should be experience sharing mechanisms among FTCs so as to cross fertilize the successful results throughout the study area and lesson are developed and institutionalized.

1. INTRODUCTION

1.1. Background

The development of the Ethiopian economy heavily depends upon the speed with which agricultural growth is achieved. The rate of agricultural growth in Ethiopia in turn depends on the speed with which the current subsistence oriented production system is transformed into knowledge based and market orientated production system. Among the many institutional support services that need to catalyze/support the transformation process, the agricultural extension service plays critical role, since it contributes to the development of the skill and knowledge of farmers to adopt new and improved technologies and the approaches and processes with which the skill development and access to information are realized (Birhanu *et al.*, 2006).

In agricultural extension delivery systems, effective training is expected to change the knowledge, attitude and practices (KAPs) of a trainee. According to Marsden (1998; as cited in Adesoji *et al.*, 2006) the aim of training is three folds: to provide workers with the appropriate tools, which include both conceptual and technical issues to carry out their work more effectively; to make them aware of recent comparative developments within their field of interest; and to open up alternative ways of thinking and implementing social development programs. Training thus combines holistic approaches in attempt to provide access to and interpretations of current information.

However, Ethiopian agriculture is characterized by traditional and subsistence peasants farming sub-sector whose access to modern technology and to that of basic education is very limited. It is also noted that low investment in developing agriculture labor force is one of the problems that hindered the transformation of the sector. Despite these desirable characteristics, though, the sub-sector generates the bulk of the total agricultural output of the country (MoA, 2000).

Therefore, agricultural change and development require the mobilization of human resources through means such as education and technical training. Agricultural education and training are key elements in the whole process of agricultural change and the achievement of rising levels of rural prosperity. It can function effectively only if the national system of education as a whole is geared effectively to the needs of development. Agricultural education and training can succeed in their objectives only when integrated into an overall development programs. The training programs must be shaped to meet the needs of the farmers. Identifying and meeting the needs of the particular community requires trainers familiar with and acceptable to the people among whom they work. The most important characteristics of the good multipurpose trainers are those of maturity and ability to inspire confidence (Assefa, 1991).

Farmers are more likely to adopt new technologies and become more productive with the help of basic education and extension services. They will be better equipped to make more informed decisions for their lives and to be active participants in improving economic, social and political dimension of development. Hence, rural youth are the farmers of the future and most of them start farming at a very early age. In rural areas, especially poor farmers, access to education is still much lower and the quality of non formal education is poorer and often irrelevant to their lives (St.Mary, 2006; CSA, 2006).

Due to the ever-growing demand of the farmers for training as well as the need to raise the agricultural output, large-scale multi-disciplinary training programs in well-equipped training centers were recommended in the early 1980s (Zelege, 2000). The first Farmers Multi-purpose Training Center (FMPTC) of the country was established in the year 1980 at Agarfa in Bale, Oromia Region. Its main objective was the quick transfer of technology to the rural population so as to raise the quality of agricultural production, the living condition of the rural community and the country as a whole. This farmers training center was one among the other anticipated five FMPTCs to be established in various administrative zones of the country. The FMPTC at Agarfa had the capacity to train 2,000 farmers at any one time (ibid).

Realizing the situation, the government had started FTCs programs, and planned to establish about 15 thousand FTCs throughout the country to enhance the knowledge base of farmers and to provide the institutional framework for increasing the efficiency and effectiveness of agricultural advisory services. Almost every woreda in the country has been constructing FTCs; and some woredas have already constructed the required number of FTCs. The FTCs are constructed with the participation of the farmers. FTC were expected to serve as centers of extension service and information, places where modular training to farmers from three up to six months to be given, and also serve as sources of advice on projects. Local communities are expected to gradually takeover ownership and management responsibility for the functioning of the FTCs (MoARD, 2005; Birhanu *et al.*, 2006).

The agricultural extension service at the FTCs was expected to play an active role in linking farmers with other institutional support services such as input supply, credit, co-operative promotion, and agricultural produce marketing. To bring realistic transformation in agricultural extension service, farmers must be trained to improve their knowledge, skill and attitude towards deciding in their own affairs, access to information, exposure to improved farming and living practices (Birhanu *et al.*, 2006).

Towards this end formal training was provided to farmers, based on a number of crops, livestock and natural resource management to increase their production and productivity. Formal and non-formal trainings are equally important. But farmers need to have an opportunity to learn non-formal training at their farming community through different training programs. And thus, the government has launched potential development goals including modular training, extension and information service at FTC. Many efforts have been made by different organization to strengthen this program such as the training of extension agents, newly established and building FTCs (MoARD, 2008). In addition, the systematic processes of farmers training must include; the selection of the participants, training need assessment, goal and objective setting, organizing training techniques and exercises, and monitoring and evaluation (Caffarella, 2002).

Although some time have elapsed since the government launched FTC-based farmers training, assessment of the relevance and effectiveness of the training in a specific context is rare. Hence, this study contributes towards addressing such a knowledge gap.

1.2. Statement of the Problem

Farmers' training is an integral component of the agricultural extension services of the country. And it is a key to mobilize the farming community towards development for the betterment of their live and the country's development at large. The contribution that training can make to agricultural development is substantial. But the existing farmers training process is blamed with a number of deficiencies. The basic issues such as conduction of appropriate farmer training needs assessment, participating farmers in curriculum development, content determination and in deciding the duration and schedule of the training and incorporating farmers indigenious knowledge in the program to make the learning experience participatory and relevant are among the limitations (Kefyalew, 2006). Although, a number of workshops were conducted to discuss and deliberate on as to how to make farmers training relevant, effective and practically useful, these was often done in absence of the farmers and in rare case with few farmer representatives.

The status of FTC program, in Tigray Region in general and in Alamata woreda in particular, is no different. So far, 10 FTCs have been established in 10 of the 13 Kebele Associations in Alamata Woreda and the FTCs started demonstrations of improved forage, crop and natural resource management and conservation related technologies, delivery of modular training to enhance technical capabilities of the farmers in crop and livestock production and in cooperative related activities. The FTCs are also serving as venue where agricultural input gathering and delivery takes place.

In general, in Alamata, so far emphasis has been given in fulfilling the necessary material, human resources and expanding the FTCs outreach throughout the mandate areas of each PA. However, the situation of each FTC with respect to the type and the quality of the training offered in terms of content, methodology of delivery, training subject matter with respect to,

the demands of the direct beneficiaries are neglected. In addition the relevance and effectiveness of the FTCs-based training as a whole is remained as one of the unattached agenda for development studies. Moreover, factors such as demographic, socio-economic, institutional and other related household level issues, which differentiate participants of the training offered at FTCs from those non- participants have not been studied systematically. Hence, addressing this knowledge and development gap is of paramount importance in order to re-orient the directions of the training offered at FTCs towards demand-driven training which is capable of bringing about significant development impacts. Hence, comprehensive studies are required on the effectiveness of training, in terms of their relevance, curriculum design, training methodology, materials and aids, training evaluation, and impact assessment. Therefore, to address the aforementioned issues the researcher is motivated to focus on analyzing the relevance and effectiveness of FTCs based training in Alamata woreda, Southern zone of Tigray region.

1.3. Objectives of the Study

The purpose of this study is to analyze the relevance and effectiveness of FTC-based training in Alamata woreda so as to come up with ways to make the training demand-driven or client oriented and effective.

The specific objectives of the study are:

- to analyze the relevance of FTC-based training;
- to analyze the effectiveness of FTC-based training in knowledge, aspiration, and practice change; and
- to identify and characterize positive deviance FTCs.

1.4. Research Questions

1. What is the relevance and effectiveness of FTC-based training?
2. How do farmers perceive the effectiveness and usefulness of FTC-based training?
3. Are there FTCs with successful experience for scale-out \ up?

1.5. Scope of the Study

In this study, an effort was made to analyze relevance and effectiveness of FTC-based training and positive deviance FTCs. The study was delimited in Alamata woreda, Tigray Regional state. Due to Pilot Learning Site of ILRI-IPMS; it is the area at which the study had conducted. Besides the scope of the area, the study was focused on relevance and effectiveness of FTC-based training and identified and characterized positive deviance FTCs. Hence, it is important to note that because of the fact that the agricultural training program delivered through out the country are pursued to be similar, its results could be an important inputs to other areas. Moreover, taking the concerted efforts made to collect both qualitative and quantitative data from multiple sources like farmers, development agents, and experts to smoothen the research process could be plus points. Hence, the recommendations and policy implications of the study can be used for other areas of similar contexts and as a basis for further studies.

1.6. Significance of the Study

Agriculture is the most important sector of Ethiopian economy, and is mainly dependent on traditional farming. Doing all possible efforts to eliminate agricultural problem is therefore, updating the country's labor force by giving dew consideration will contribute to the overall development strategy of the country. In this regard, assessing the organizational issues and constraints related to farmers training, has significant contribution in pin-pointing areas that need attention for future improvement. However, so far no comprehensive research has been done in assessing the overall performance of farmers training centers in changing the mindset of the farming community in the study area in particular.

Therefore, this study is believed to generate useful information and provide feedback for policy makers and development practitioners so as to make the training process demand driven and effective. Moreover, the empirical information generated from this study is expected to serve as a basic document for future reference and existing knowledge improvement and suggest important alternative improvement insights to the ongoing training processes and help the concerned actors improve in their day to day activities in the process training delivery as well as relevant rural development endeavors of activities.

1.7. Organization of the study

The thesis is organized as follows. The next section reviews related literature of study, methodology and area description is described in the third chapter. The fourth chapter deals with results and discussion. The fifth chapter outlines summary, conclusion and recommendations of the study in general.

2. LITERATURE REVIEW

In this chapter the key concepts and ideas pertinent to the theme of the thesis are discussed. In addition relevant empirical research and their findings are reviewed in order to inform the current analysis.

2.1. The Evolution of Farmers Training and Extension in Ethiopia

2.1.1. Historical background

In Ethiopia agriculture related training started in the early 1940s, following the establishment of Agricultural and Technical Schools at Ambo and Jimma (Beintema and Solomon, 2003). During the socialist regime in Ethiopia, Functional Adult Learning (FAL) programs were initiated in 1974 through Community Skills Training Centers (CSTC), though the need to provide focal points for adult education programs to meet skill training needs had been recognized much earlier. The community training program in Ethiopia was also initiated in 1975/76 (Zelege, 2000).

The Education sector review of 1971/72 came up with proposals for what was known as “Community practices”. Later on, these plans were converted into what is known as the Community Skills Training Centers Program (CSTC), which was designed to reach rural people all over the country. By 1977, about 408 CSTCs were established. Out of these, only 121 were active (Zelege, 2000). Nevertheless, one should understand that CSTCs grew out of the experiences of Work Oriented Adult Learning Program (WOALP) or what is generally known as “Functional Literacy”. CSTCs were established to serve as focal points for various development activities in the rural areas. Since they were closely located to the rural communities, as the major beneficiaries, they were expected to gear their training programs to the needs of the communities and the peasant associations they were intended to serve. The overall objective of the CSTC program was to provide the rural population with knowledge, skills and attitude needed for effective participation in the economic, social, political and cultural development of the country (MoE, 1982). The program was thus part of the national

effort to create a knowledgeable and skilled society whose members were motivated to continue learning as well as applying the new knowledge, skills and attitudes in their daily life and work.

According to the Rural Development Policies and Strategies of Ethiopia (2001), one of the major ways of implementing modern farming methods was through extensive utilization of human labor by motivating the human labor in agriculture through agricultural education and training. This method focuses on educating and training the agricultural labor and enabling them to use modern agricultural technology and techniques. It is a direction, which fully utilize all alternatives to enhance agricultural productivity per plot of land through the development of irrigation and highly valued agricultural outputs. It is trained human power centered productivity and technological development strategy. Efforts must also be made in order to substitute the present farming generation by an educated one. An educated farming generation is the one that will obtain general education and therefore will be able to read written notes and understand and implement new agricultural technology in a scientific way. This requires accomplishing at least the present elementary school education. However, this is not enough. The farmer should also obtain agricultural skill training (MoI, 2001).

In the past, PADETES (Participatory demonstration and training extension system) had been employed as a policy instrument to achieve sustainable agricultural growth through the transfer of pre-defined technology and associated information to smallholder producers. With the implementation of PASDEP, the national agricultural extension strategy has recently made another shifted from the previous farm visits and on-farm demonstration of technologies under PADETES to the Farmer Training Center (FTC) approach. Enormous public investment was made to establish twenty five junior Technical and Vocational Education and Training (TVET) colleges. ATVETs were primarily established to upgrade the educational level of 15,000 development agents (DAs) who were in the service to diploma level, and train about 51,000 new DAs at the same level (World Bank, 2006; Birhanu *et al.*, 2006). The ATVETs would gradual shift their focus to the private sector, and supposed to deliver custom-made short and regular training to the sector. The MoARD's target for establishing FTC in every rural kebele, and training the required number of DAs and assigning three DAs,

specialized in crop, livestock and natural resource management, to each FTC that had already been achieved in 2007 (Tesfaye, 2008).

2.1.2. The emergence of Farmer training centers in Ethiopia

The first Farmers multi-purpose training center (FMPTC) of the country was established in the year 1980 at Agarfa, Bale in Oromia region. Its main objective was the quick transfer of technology to the rural population so as to raise the quality of agricultural production, the living condition of the rural community and the country as a whole. This farmer training center was one among the anticipated five FMPTCs to be established in various administrative zones of the country. The FMPTC at Agarfa has the capacity to train 2,000 farmers at any one time (Zelege, 2000).

Addis (1991) indicated in his report as there were ten residential farmers training centers in the past military government. These FTCs were run by the training department of ministry of agriculture. They were, Agarfa MPTC, which have the capacity of training 2000 farmers in one intake. Asmara FTC, (now free sovereign country) Kombolcha FTC(Wollo),Wereta FTC,Holeta FTC ,Bako FTC ,Nejo FTC ,Welita FTC ,Bekoji FTC, Kombolcha FTC (East hararge).The smaller nine FTCs have a capacity of training 50-250 farmers in one intake. At present all of them have become ATVET colleges.

The objectives of farmer training centers are stated in the project proposal of farmer multipurpose training centers which states “to alleviate the prevailing rural development problems and to bring rapid socialist transformation of agriculture with a view to raising in the shortest possible time agricultural output and the standard of living of the rural masses” (MoA, 1980).

To achieve the objectives, the strategy calls for training of farmers based on short term introductory residential (with lodging and boarding facilities) programs at Agarfa Multipurpose training center. Barwell (1985) argues that residential farmer training has a number of advantages: i) courses are specially geared to particular needs of the trainees, ii)

practical work with demonstration can be given by the center, iii) training materials with the necessary visual aids can be made available, iv) trainees have opportunity to share past experiences because they stay together, v) study visits can be organized to nearby farmers experiment, research stations, peasant cooperatives and agro- industrial plants.

The above ten farmers training centers teaching is conducted by more staff members trained in training methods as compared to relatively the local extension assistants found in areas from which farmers came. They are well equipped to teaching learning purposes with the necessary accommodation, catering and teaching services. All of them were fulfilled by many facilities. Training methods include 30 percent on theory and 70 percent of practical basis. The practical works were supported by using the demonstration plots available within the center and the nearby farms. The classroom instructors were facilitated with teaching aids. However, the problem with the residential farmers training centers in Ethiopia was not only that they were few in number when compare to the relative size of the farming population were supposed to serve but, also they were not in position to fulfill their role of accelerating agricultural production (Barwell, 1985).

Addis (1991), on the other hand, found major constraints of residential farmer training centers such as biases during selection of trainees which is exclusion of women in training, selection with personal relationship, trainings conducted so far were mostly not need based, deficiency of the training policy, lack in revision of curriculum, lack of coordination between farmers training centers and local extension service and also minimum consideration of evaluation.

The current government opted for having FTCs in each and every kebeles, rather than havening limited residential FTCs as it was in the past. Hence, regional governments have committed themselves for the establishment of FTCs in some 15,000 Kebeles, the technical upgrading and expansion of front line extension agent to diploma level through ATVETs-based training. Ultimately, the FTCs could develop into multi-purpose centers providing a range of services and information beyond agriculture. Moreover, the FTC program implies that providing a community focal point and expanding access to education for farmers will accelerate the commercialization of agriculture and thereby rural transformation. This will

depend, however, on the quality and relevance of the training and services offered among other things, on the operational support given to the three comparatively inexperienced DAs. The significant expansion of DA numbers together with the number of FTCs has huge implications for increased operating costs including in-service training and backup support from woreda based staff. A crucial constraint of the existing extension service is the shortage of operational funds. Further, quite apart from the building cost, the need to ensure the FTCs are adequately equipped and maintained in order to carry out their intended task, will require substantial capital, the availability of which is somewhat problematical (Ashworth, 2005; Birhanu *et al.*, 2006).

2.2. Key Concepts in Farmer Training

2.2.1. Training

According to different authors training defined as the process of providing knowledge, skills and bringing about desired changes in attitudes in order to improve the competence of people being trained. Van Dersal (1962; cited in Burton *et al.*, 2000) also defined training as the process of teaching, informing, or educating people so that (1) they may become as well qualified as possible to do their job, and (2) they become qualified to perform in positions of greater difficulty and responsibility. Usually an organization facilitates the employees' learning through training so that their modified behavior contributes to the attainment of the organization's goals and objectives. Human Resource Development (HRD) is one of the many strategies in achieving the vision for development in any country. Training can be one of the best ways to develop human resources. It aims to develop people's potential and enable them to use this potential towards the achievement of their vision of self-reliance and self sufficiency. It covers the development of peoples' KSA as they deal with their day-to-day life situation (IIRR, 1997; Marrissa, 1998).

Farmer training is education that most often takes place outside formal learning institutions. It differs from education in schools because it is geared towards adult learning. Mature adults are self-directed and sufficient in most aspects of their lives. Adults tend to resent educators

that fail to take this fact into account. They do not appreciate being talked down to or having their autonomy restricted in ways that show a lack of respect (Hassen and Amdissa, 1993).

Flippo (1961; as cited in Burton *et al.*, 2000) differentiated between education and training, locating these at the two ends of a continuum of personnel development ranging from a general education to specific training. While training is concerned with those activities which are designed to improve human performance on the job that employees are at present doing or are being hired to do, education is concerned with increasing general knowledge and understanding of the total environment. Education is the development of the human mind and it increases the powers of observation, analysis, integration, understanding, decision making, and adjustment to new situations.

In addition, extension education is generally the main, if not the only means for farmers' education in developing countries and is a specialized form of the broader concept of adult education (Arnon, 1981). Besides formal training, non-formal and informal learning opportunities are important in enhancing the capacity of farmers. Non-formal training is defined as any form of training for which the content and learning aims have been defined. This usually means training is based on well-defined curricula, either within or without an institution, with or without guidance from a teacher or trainer. Informal training, on the other hand, is any form of training for which the content and the learning aims are not defined. Hence this encompasses on the job-training, traditional apprenticeships as well as self-organized learning. It includes any form of learning that happens "on the side", i.e. through activities whose primary aim is not learning. Learning is a by-product of these activities (Cedefop, 2003).

The effect of formal and informal training on farmers income levels have long been analyzed in economics literature. Specifically, Anderson (1997) suggests that education and training are essential for managing and promoting the changes that farmers are to be sustainable. Similarly, Kilpatrick (1997) showed that farm businesses with managers who had participated in more education and training are more profitable. Similarly awareness of possible innovations through mass media and contacts with expert advisers are proved to be leading

superior outcomes. This framework focuses primarily on training for people with at least basic literacy. Training programs for illiterates, in particular functional literacy programs and livelihood skills training, will be considered in a future step (Ibid).

2.2.2. Participatory training and the principles of adult learning

Participatory training is an educational process that is based on the assumptions of adult learning, deciding on what they want to learn and the best way to learn. It encourages participants to see themselves as a source of information and knowledge about the real world. It refuses to accept that people do not know anything, recognizes the value of popular knowledge and encourages people to participate in their own learning process. When they are encouraged to work with the knowledge they have from experience, they can develop strategies together to change their immediate situation. Participants control the process of learning and trainers play the role of facilitators. Thus, this process gives participants a sense of empowerment and they start recognizing their existing knowledge and its value. In doing so, they become more open to and actively share responsibility for seeking new knowledge. This enhances the learning process and feeling of ownership of the knowledge. Thus, participatory training becomes a tool and a strategy for social change when people start valuing the process of collective analysis. So, the first task of participatory training is to create an understanding that change is possible, that it is possible to change one's situation. The second task is to enable individuals and communities to identify what types of change they wish to achieve and how to go about attaining that (RISE, 2001).

In regards to adult learning, Verner (1964) finds adult education difficult to define but succeeds in condensing his opinion into one sentence: "the term adult education is used to designate all those educational activities that are designed specifically for adults."

The role of adult education in development is multi dimensional. Indeed, as one of the building blocks of human development and not just a basic right, education including adult education, is a foundation for progress in areas such as human capital, health, nutrition and

the development of institutions and democracy. Adult education also plays a major role in social development. It is now widely admitted that growth will not reduce poverty unless poor people are able to actively participate in it. Such participation can become effective to a large extent through adult education. It is apparent from the foregoing that adult education is an indispensable vector for social, economic and political progress in any society and in particular in Africa, the least developed part of the world (Seya, 2005).

Another important point to consider in adult training is handling adults as groups. Reminding us that adult education carried out in a group can be a great help towards achieving learning or inhibit learning, Rogers (1988) states that, ‘the teacher of adults needs to balance the usefulness of the group against the growth of individualism, describing action and self reliance’.

Besides to this, many scholars have expressed their views at different times. For example, Markham (1965) noted that, “The learning should be informal, with numerous demonstrations and practice of the method taught. Visual aids are desirable. The best of which is good farming (both on the training center’s farm and on neighboring farms) the very items themselves used in agriculture, flannel graphs, models and specimens. The use of sophisticated aids in adult farmers’ training should only be practiced by very experienced people and then on a limited scale”.

Fay (1962) has also expressed his view that “Adults learn most rapidly when they have a strong desire to learn, a clear goals, put forth an effort to learn and satisfaction from what they have taught”. Therefore, in extension education in a democratic system, participation of the people in extension programs is voluntary. The people have complete freedom whether or not to join an extension program. The behavior of the people has to be changed not by ordering or coercing, but by educating and motivating them. Unless the people are convinced, unless they get good results, unless they are satisfied, they should turn their faces away from extension (Singh, 2001).

2.3. Phases of Farmers Training

2.3.1. Planning phase

This phase includes the first two broad stages of training: Need assessment and design and preparation of training. Determining what you want to achieve and how you will achieve it. It is the curriculum development process, which includes a series of steps that it followed, and will help ensure consistent and effective training efforts (Hassen and Amdissa, 1993).

2.3.1.1. Training Need Assessment (TNA)

The first component in developing a training program is finding out about the people to be trained and the type of training they need. This process and the information collected are usually called needs assessment. Needs assessment broadly defined, as a systematic process for establishing priorities and making decisions regarding programme planning, development and operations. It indicates what training should focus on and helps to define the training objectives. It also aids in the selection of the training activities (Swanson *et al*, 1997).

Beside this, TNA is a systematic way whereby training needs are identified, prioritized and selected for specific actions as part of training programmes and also prescribed to identify the training needs of the participants. Training need is a condition where there is gap between “What is” and: what should be” in terms of their knowledge, skills attitudes and behavior for a particular situation or task in which they are involved. The gap is called “a problem” which usually occurs when a difference exists between “desired performance” and “actual performance”. The needs identification process helps the trainers in making sure that they have matched a training programme to a training problem (IRRI, 1990).

Needs assessment, whether it is conducted using local or donor resources, must produce tangible results and directly benefit the people involved in the Non-Formal Education (NFE) activities. If extension workers want to score some success in getting tangible results in development work, they must avoid the temptation of assuming that the people they are trying to serve are incapable of identifying and analyzing their needs and that they must do it for them. Such assumptions run

the risk of turning people in to “objects” of development rather than in to active participants in the change process (Moleco and Richard, 1995).

Training is more effective in changing behavior, if it is related to ones actual work situation i.e. a felt problem, or a problem that is in some other way is experienced as important or relevant. Individuals learn more when they themselves feel a need to improve or change than if they are “told” to learn something or change for reasons that are alien to them (Hassen and Amdissa, 1993).

2.3.1.2. Objective and content development

This is the most important part in a training program after a need for training has been identified, the objective and content specifies what will be taught and how it will be. It provides the frame work and foundation of training taught. The first phase of curriculum development determines what will be taught that is the training content (Campbell and Barker, 1997; as cited in Tsion, 2008). Setting clear training objectives based on the identified participant need will yield fruitful results in training. If participants do not express a need for training, even after initial needs assessment interactions with the trainers, then there should be no training. Unfortunately, most training situations are devoid of training needs and objectives. Because, such training is, a delight in the number of workshops held in a given time, rather than in the impact of such training. Our belief is that trainers should be concerned more for the quality and outcomes of training interventions than in their number (Rama *et al.*, 1993).

In converting needs into objectives, three areas of performance may be identified: skills, knowledge and attitude. Skills-related objectives indicate what the trainee can do, demonstrate or perform as result of the training. Knowledge-related objectives refer to the participants’ ability to identify, define or describe given concepts as a result of the training. Attitude objectives are less easy to measure although it may be useful to make explicit the desired attitudinal change. The trainer and the trainees should understand and agree on the objectives of the training course. It is a useful technique for the trainer to refer to the course objectives at

key times in the course to ensure that the trainees recognize how the training is progressing towards achieving the objectives. When participants know what is expected of them they can organize their efforts more effectively (Swanson *et al.*, 1997).

Setting objectives is useful and important for a number of reasons. First, when there is no clearly defined objective, there is no ground for the selection and design of instructional materials and content. Secondly, trainers have to state training objectives clearly so that they are able to say whether the training has been a success or not. Thirdly, clearly defined objectives provide participants at a given trainer encounter with the means to organize their efforts toward fulfillment of these objectives.

2.3.1.3. Training methodology

A training programme has a better chance of success when its training methods are carefully selected. A training method is a strategy or tactic that a trainer uses to deliver the content so that the trainees achieve the objective (Wentling, 1992; as cited in Mahlangu and Sekgota, 2005). Selecting an appropriate training method is perhaps the most important step in training activity once the training contents are identified. It is also good to use a variety of training methods throughout a training to maintain the interest of the trainees. There are a variety of methods and techniques for conveying information to trainees, but not all of these are equally suitable for all topics and in all situations. To achieve the training objective, a trainer should select the most appropriate training method for the content to involve the trainees in the learning process. Four major factors are considered when selecting a training method: the learning objective, the content, the trainees, and the practical requirements (Wentling, 1992; as cited in Burton *et al.*, 2000; FAO, 1996).

According to FAO (1996) training methods can be grouped under three broad categories: presentation methods, where the trainer plays a leading role (e.g. lectures, demonstrations); interactive methods, where trainees interact among themselves as well as with the trainer (e.g. discussions, role play); exploratory methods, where trainees are involved in specific tasks either in groups or on their own (e.g. case studies, exercises).

According to Paulo Freire, the methodology applied to empower the trainees to learn specific and economic skills, integrated, oral communication is preferred to written communication. Dialogue is the key methodology. Trainees are encouraged to discuss in groups. To create the right mood, soliciting learners is done through brainstorming. Learners are also encouraged to consolidate what they have learnt through questions and answers, exposing them to demonstrations, media, and role-plays and through the participation in the analysis of case studies. Trainees are also encouraged to genuinely involve and participate in problems identification, the planning and implementation of tasks. Participation is central in Functional Adult Learning (FAL) program areas. According to Melesse (1997), participation is critical. Hence, through the vehicle of participation FAL empowers learners to help them develop new attitudes, values and practices towards education in particular and development in general.

2.3.2. Implementation phase

It is the actual conduct on delivery of training based on physical facilities, sequence of training and choosing effective training methods and techniques to deliver it. Once the planning phase of the training program is completed, then it is time to implement the course. Implementation is a point where a trainer activates the training plan or it is the process of putting a training program into operation. Once the training center and concerned organizations agree to implement training, the next step is to deliver effective training using arranged available resources. All these resources need to be well managed and coordinated to run the program smoothly (Swanson *et al.*, 1997).

2.3.3. Monitoring and evaluation phase

Monitoring is an internal activity designed to provide constant feedback on the problem it is facing, and the efficiency within which it is being implemented. It is continuous assessment of gathering information on all the aspects of a given duty. Evaluation is a periodic assessment of the relevance, performance, effectiveness and impact of a given activity in the context of its

stated objectives which involves comparisons requiring information from outside the project in time, area and population (St Mary, 2006).

2.4. The Concept of Positive Deviance and its application in Empirical Research

2.4.1. The evolution of approach and concept of ‘positive deviance’

Positive deviance is an approach to personal, organizational and cultural changes based on the idea that every community or a group of people performing a similar function have certain individuals “the positive deviants” whose special attitudes, practices, behaviors; enable them to function more effectively than with the exact same resources and conditions. Un-common behaviors and strategies enable them to find better solutions to problems than their neighbors or peers, while having access to the same resources and facing similar or worse challenges. It is problem solving and community driven approach that enables the communities to discover successful behaviors and strategies and develop a plan of action to promote their adoption or scale-out\up by all concerned (Sternin, 1990). Besides, positive deviance focuses on new application approaches to address issues and promote new ways of doing things. This approach enables communities to solve problems, which require behavioral and social change by offering workshops, trainings, technical support and on-line resources. Positive deviance is also a concept originating in sociology to describe behaviours that do not follow dominant beliefs and values, and that are intended to increase the well-being of a community or an organization. It has profound effects on the individuals and organizations that partake and benefit from such activities (Sternin, 2009; Ben-Yehuda, 1990 and Spreitzer *et al.*, 2004).

According to Sternin (2009) and Galperin (2002), positive deviants are those persons whose practices or behaviours allow them to perform better or to discover better solutions to issues than other people who have access to the same resources. Moreover, positive deviant behaviors may comprise behaviors that organizations do not authorize, but help the organization reach its financial and economic goals. Thus, positive deviant behaviors may include behaviors such as innovative behaviors, noncompliance with dysfunctional directives, and criticizing incompetent superiors. The literature on innovation suggests that by its very

nature, innovation requires, at least in part, a departure from the organizational accepted norms. This is because innovative thinking involves the creation and development of new ideas that are not held by the majority (Galperin, 2002).

Sustainable ways of life is possible and desirable by taking positive solution-oriented approach. Consider the reasons for challenges and outline new ways of thinking for the proper designing. It is a strategy for change. A growing number of people are practicing positive deviance (Sara, 2010). This approach has two assumptions: What solution the community problem already exists within the community of interest, and that is possible to find successful solution to problems right now before all the underlying causes are addressed. Positive deviance has the following steps: The first step is defining the problem. It analyzes what people want to achieve and what are the current practices (need and its objectives). The second step is determining if positive deviances exist. Here farmers' profile, identity, pool of good performances (possible positive deviances) can be examined, defined and described by the characteristics of the community. The third step discovers un-common behavior. Un-common behaviors and practices enable to find better solutions to problems and identify poor performers or agents in the poor performance group and their common practice in use of resources. It scrutinizes the good performance group by contrasting with poor performers. The fourth step is designing opportunities to practices. It is the system of monitoring poor performance progress. Here the burning issue is how to make motivation to become positive deviants and if successful, how to scale up. This is a new problem solving approach (Sternin, 2009).

Spreitzer and Doneson (2005), also states that there is a greater likelihood that employee with engaged in positive deviant behaviors once they are psychologically empowered in the working environment. "It is clear that psychological empowerment is likely to be a key enabler of positive deviance. Empowerment enables employees to participate in decision making, helping them to break out of stagnant mindsets to take a risk and try something new. Organizational behavior researchers point out that, the pervasive influence of norms provides a means of control over what people say and do.

In addition Positive deviance requires real risk, and it requires `departing from norms in a positive way-often making others uncomfortable. In other words, when companies enable their employees to be empowered the employees are more likely to engage in risk-taking behaviors that depart positively from the norms of the organization in a way that is beneficial to the organization. And, companies making their employees empowered have led to much financial and psychological gain: “supervisors who reported higher levels of empowerment were seen by their subordinates as more innovative, upward influencing and inspirational” (Ibid).

2.4.2. Measuring positive deviance for empirical analysis

More contemporary work on deviance has sought to learn from the boundaries of human behavior about social order, control and change. Although the study of deviance has changed since its inception, one common thread that unites most deviance scholarship is a focus on the negative: harmful behaviors, marginalized individuals, and so on. We wonder if the scholarly gains from research on deviance have been limited by its almost exclusive focus on negative behaviors. To understand possible constructions of positive deviance for organizations, it is useful to consult other attempts at constructing a definition of positive deviance (Scull, 1988; as cited in Spreitzer and Sonenshein, 2004).

The sociological literature offers four major perspectives on deviance: The first is *statistical approach* (Perhaps the most common approach to deviance is referred to as *statistical deviance* (Clinard and Meier, 2001). The statistical version of positive deviance is a useful formulation, but it also comes with limitations. By definition, anyone scoring in the minority within a behavioral curve is a deviant, either negative (to the left) or positive (to the right)), the second approach is *supra conformity* (This kind of behavior is conceptualized as pro-normative, but becomes deviant because it extends beyond the bounds deemed appropriate by a referent group), third approach also *reactive* (This considers a behavior (traditionally) deviant if a negative condemnation by an audience occurs, such as publicly labeling a behavior as depraved or punishing an individual for engaging in a behavior), and the last is *normative approaches* (The normative view defines deviance as a departure from norms.

Often are not cognizant of a norm until it is violated and there is a response to it. That is, infer a norm exists from the presence of a reaction to a perceived violation of a norm (Oreilly and Chatman, 1996). Spreitzer and Sonenshein (2003) also define the normative approach as follows: intentional behaviors that depart from the norms of a referent group in honorable ways. The normative formulation of positive deviance focuses on the nature of a behavior (whether it departs from norms).

Moreover, Spreitzer and Sonenshein, suggest that measuring positive deviance is critical to conduct the kind of empirical research to test the proposition on the individual/psychological facilitators of positive deviance. Also to understand the facilitators of positive deviance, the proposed measurement of positive deviance will also play an important role in examining possible outcomes or results of positively deviant behavior in organizations and communities. For example, one research question could address whether positive deviance is contagious, that is, when others observe positively deviant behaviors, do those others also tend to act in positively deviant ways. For the purposes of this, we will not be presenting any data, but will focus on the kinds of measures that capture the substance of positive deviance (Spreitzer and Sonenshein, 2003).

For a measure to be valid, it must have a strong theoretical basis. The measure will be based on the definition of positive deviance adopted for this article, which has a strong theoretical underpinning: first part of the definition suggests that positive deviance is intentional behaviors (voluntary, purposeful, and discretionary, rather than forced or coerced), the second part of the definition suggests that significantly depart from the norms of a referent group and the third part is honorable ways. In using this definition, the need to measure a specific set of behaviors that are part of the episode of positive deviance (i.e., an event or series of events). In other words, positive deviant behavior must be praiseworthy and must focus on actions with honorable intentions; irrespective of the outcomes. This definition also has several parts to it, each of which is necessary for articulating the option of positively deviant behavior. Before having a respondent rate a possible episode of positive deviance along a set of items, want to identify a particular episode to assess (Spreitzer and Sonenshein, 2004; Mathews and Wacker, 2002).

2.5. Review of Empirical Research on Farmers Training Relevance and Effectiveness

2.5.1. Factors influencing the relevance and effectiveness of farmer training

Kefyalew (2006) reported that farmers training programs undertaken in Ethiopia are with a number of problems. Some of the serious shortcoming of the trainings are that there is no clear training policy that guides the involved actors, the presence of which may clear those confusions of lack of uniformity in participation of the farmers, duration of the training, absence of curriculum or guidelines to make it at least uniform but flexible. The skill and knowledge gained through training was not sufficiently backed by provision of inputs and services especially, for the poor farmers, because of inability of paying down payment. On the other hand, the key issue of training which could help to solve a number of problems, i.e. the training needs assessment was neglected. These could clearly indicate that at the verge of the declared campaign in the country to open hundreds of Farmers Training Centers (FTC).

According to Ousman (2007) the trainings offered to farmers were not responsive to farmers' needs and all elements of the training process or cycle are defective and deficient. In both cases, majority of the farmers applied the learning by modifying according to their situation. Lodging of teff because of urea application, high costs of fertilizers and herbicides, difficulty to plough the soil horizontally to the slope, losses during threshing, climatic conditions, lack of credit and confidence because of insufficiency of the physical and socio-economic environment were not considered. Since the plan is based on urgent quota given from the top, it lacks adjustments according to the highly diversified local conditions. Menu of choices were limited. TSION (2008) also concluded that there was no need assessment done in all research centers. The content of training were relevant with the need and farm operation. The survey results clearly indicate that, the research centers give training for less than one week. The training time was not sufficient to cover the content of training. The training methodology that suggested by farmers were practice and practical demonstration were the most important and appropriate for training. The centers were highly participating on the farmers to share their experience.

Less emphasis was given on the uses of variety of methods, locally available materials and aids that facilitate effective maximum learning through observations, interactions and practice. However, the modular trainings that will be provided in FTCs, based on the household and minimum package activities, are expected to be participative and experiential. Because of lack of effective joint follow-up and evaluation activities, through participation of all concerned stakeholders, measurements of participant's reactions, learning, changes in on-the-job performances and outcomes of trainings have not been undertaken systematically. Thus, trainings were not based on supportive and/or corrective feed backs, in which learners take time and reflect back upon the experiences gained and draw conclusions (Ousman, 2007). Ousman concluded that the trainings are not as effective as required, as far as all the above-mentioned conditions calls for improvement.

However, education in general, and training in particular, are expensive undertakings involving the use of scarce resources. Training policies and programmes should therefore meet the three criteria of relevance, effectiveness and efficiency. By relevance we mean the fit between training objectives and national economic and social needs. The yardstick of the effectiveness of training is whether training objectives are met, i.e. whether the training system is willing and able to produce the intended quantity and quality of skills and competencies. Finally, we define efficiency as producing skills without wasting resources (Torkel and Theo, 1997).

2.5.2. Empirical research on training impact assessment

Marsden and Peter (1998) stated that the aim of training is threefold: to provide workers with the appropriate tools (both conceptual and technical) to carry out their work effectively; to make them aware of recent comparative developments within their field of interest and to open up alternative ways of thinking and implementing social development programmes. In agricultural extension effective training is expected to change the knowledge, aspiration and practices (KAPs) of a trainee. Training thus combines sectoral with holistic approaches in attempts to provide access to and interpretations of current information.

According to Saint (2004), learning is the primary approach for generating capabilities. Saint further asserts that knowledge is a capability to take effective action and learning is a process of turning information into knowledge to take effective action. These approaches to define knowledge and learning are illustrative of the strong relationship between knowledge and learning. Learning may be considered as the process of making meaning of internalizing information where as knowledge forms the basis for how solutions are applied. Before knowledge can flow, it is important to ensure that the learning process has filtered and validated information as value-creating knowledge stocks. The end product of learning, training and human resource development is knowledge.

Different authors defined 'aspiration' as 'a desire or ambition to achieve something'. Thus signifies some aim or target and a preference or wish to attain it. The meaning also suggests, rather implicitly, that some effort would be exerted to realize the desired aim/target. In short, aspirations combine or summaries the preferences held, the expectations formed, and the constraints acknowledged by an individual with respect to the future (Tanguy *et al.*, 2008). Moreover, training helps individuals develop and up-grade their skills, improve their prospects of finding and retaining a job, improve their productivity and thereby contributes to raising their families' living standards and well-being. Training provides people with a means to change career, by widening the horizon of career opportunities (Torkel and Theo, 1997).

According to the World Bank (1997) learning which includes education and training is the mechanism which has the potential to facilitate development and KASP (Knowledge, Aspiration, Skills and Practice) change of individual. Farmers who participate in formal and informal training are more likely to subsequently make successful changes to their practice, compared to the level of successful changes among those who do not participate. Farmers with more education get much higher gains in income from the use of new technologies and adjust more rapidly to technological changes. Most changes to practice are influenced by interaction with, and information from, a number of sources, including peers, experts and training events. Family, extension workers and other farmers are relatively more important in prompting change for farmers with limited educational qualifications. Moreover, extension workers, other farmers and training events are important at all stages of the decision-to-change process. They are major sources of awareness of subsequently implemented strategies

and practices as well as major sources of influence on the decision to change. (Kilpatrick, 1997).

The training organized by ICRAF in collaboration with Indonesia rubber research institutes have been effective to improve farmers awareness and technical knowledge about rubber cultivation. As a result most of the trainee were put their new knowledge and skills into practice. Besides to these farmers followed up the training are found with real implementation in the field (Ilahang *et al.*, 2006). Similar study in China reveals vocational training to be an important way to improve skills of rural laborers needed in China modernization drive and more competitive in job market (anonymous).

With regard to knowledge and practice development profound result had been document in Cameroon project of SAILD. The on-farm training of farmers by farmers in Cameroon indicated improved farmers know how by providing them with practical and easily accessible knowledge, turn farmers know how to good purpose, improve farmers income, facilitate the establishment of farms and improve the productivity of small farms. In addition the training fosters the creation of a network of relationships among farmers of different types, as much as the trainers and trainees remain in touch after wards, forming what could be the beginning of real farmers' alliance (SAILD, 1998).

2.6. Conceptual Framework of the Study

Relevance and effectiveness of training is influenced by different aspects. It can also be influenced by the way in which the whole process has been carried out. Hence, this conceptual frame work presented in the figure below shows the given environment that expected to influence the relevance and effectiveness of FTC-based farmers training and positive deviant FTC in the study area.

In addition, appropriate assessment of farmers' need, appropriate module design, training aids, materials, facilities, mode of delivery, content, trainees and trainers (DAs and farmers) are elements of relevance of trainings. In doing so, multiple effects of training, i.e. knowledge, aspiration, skills, practice and positive thinking can be achieved through proper training cycle and effective training situations.

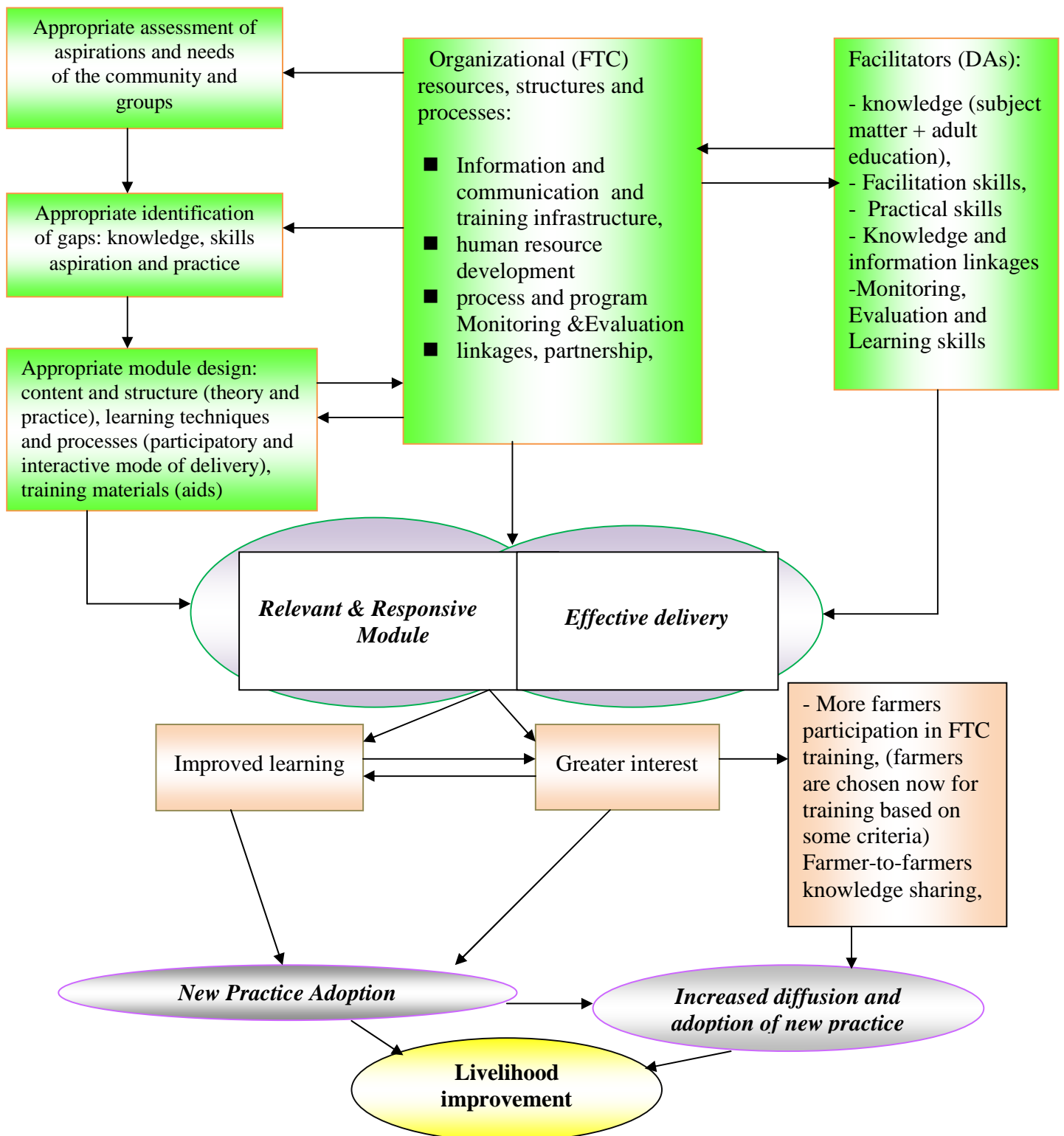


Figure 1. Conceptual Framework of the Study
Source: Adapted from Tesfaye (2009)

3. METHODOLOGY

This chapter describes the approaches and methods employed for data collection and analysis. The first sub-section of this chapter presents the description of the study area. Then the details of methodology used to conduct the overall study are discussed such as sampling procedure and techniques, method and instrument used for collecting data pertaining to each of the specific objectives as well as the method employed for data analysis.

3.1. Description of the Study Area

Alamata woreda is located at 600 km north of Addis Ababa and about 180 km south of the capital of the Tigray Region Mekelle. It is the south most woreda of the Tigray Region and borders with the Amhara Region from the south and west and the Afar Region from the east. There are 13 kebele associations and 2 town dwellers associations in the woreda. The number of agricultural households of the woreda is 17,597. The total population of the woreda was 128,872 in 2003/04. Altitude of the woreda ranges from 1178 to 3148m above sea level; and 75% of the woreda is low land (1500 masl or below) and the remaining 25% is found in intermediate highlands (between 1500 and 3148 masl). The small undulating mountains surrounding the woreda are very steep and with low vegetation cover (IPMS, 2005).

The total area of the woreda is estimated at 550 sq. km. Altitude and rainfall increase from south to north and east to west. Shortage of rainfall (moisture stress) is a major constraint of agricultural production in the woreda. Rainfall is usually intense and short duration (IPMS, 2005). As a result of all these, Alamata is one of the 16 drought prone woredas in the Tigray region.

The district is characterized with bimodal rain fall with average annual rain fall of 663 mm. Flood diversion is the most commonly used traditional system of supplementing the erratic rain fall pattern of the area .In eight of the seasonal rivers that pass through the district, it is estimated that around 6621 hectares of land can be irrigated using flood coming from high

land areas of the district during summer season (REST, 1998). The average annual temperature is $29.7^{\circ}c$ with the maximum and $14.6^{\circ}c$ the minimum averaging $22.2^{\circ}c$.

Agriculture is the mainstay of the community. Like in other parts of the country, the farming techniques used by the rural communities are traditional. The study area is characterized as mixed farming system where the livelihood of the rural community depends both on livestock and crop farming. Crop production is almost dependent on rain fed. The dominant crops produced in the district are cereals, pulse, horticultural crop and oil seeds. The cereals are mainly sorghum, teff, and maize takes the largest portion of production. It is estimated the district has livestock population 106,461 of which cattle population 74,853 comprises the major share followed by small ruminants with a population of 24,971 (Alamata woreda BoARD, 2009). In addition agricultural extension systems of the study area offers a multitudes of activities such as home-economics, training, visit, arranging field days in cooperation with the district administration officers and NGOs, organizing demonstration trials etc. Since 2004 attempts have been devoted to employ three development agents at each PA in order to offer training on livestock, natural resources and crop sub-sectors at farmer training center.

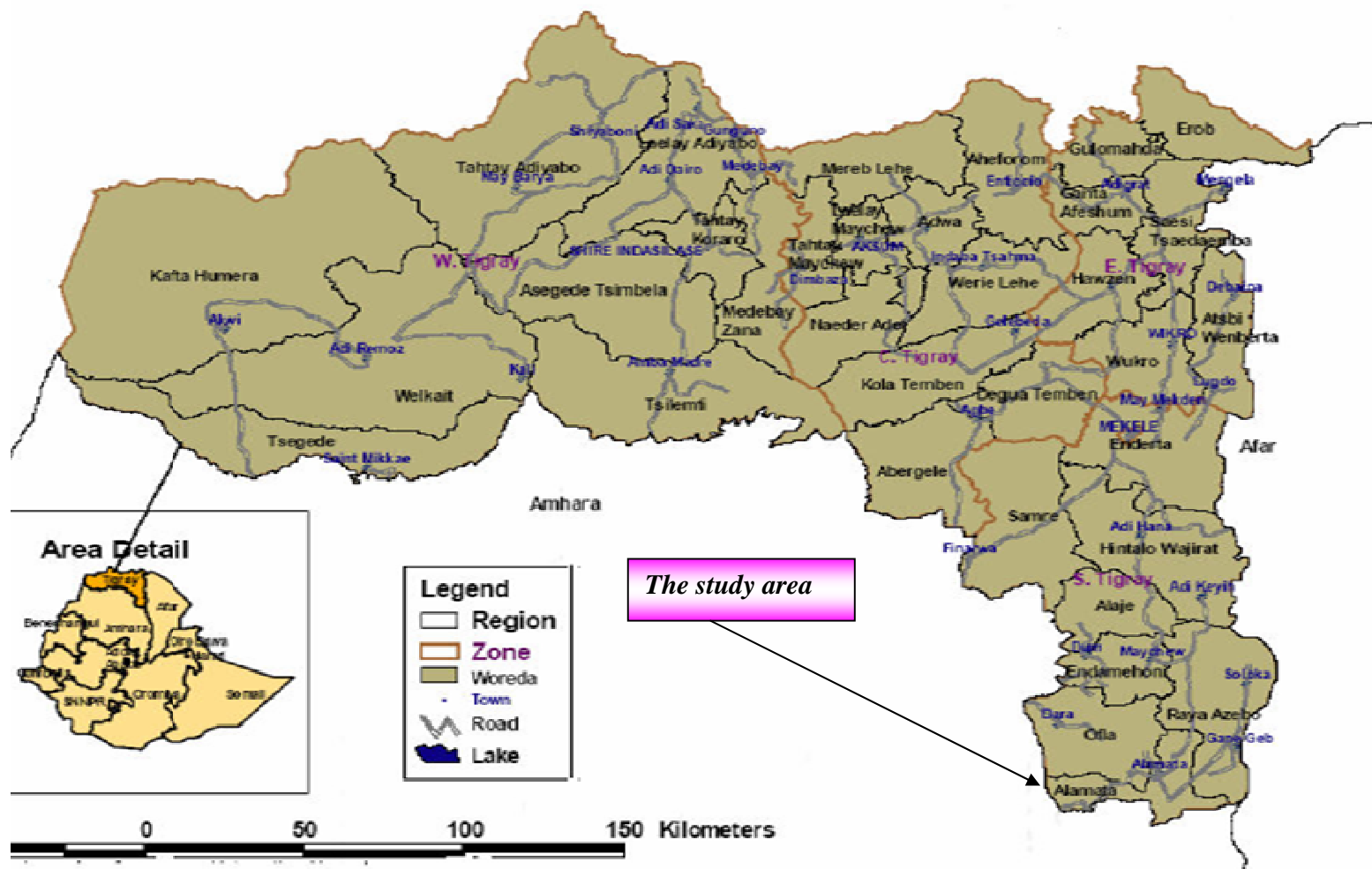


Figure 2. Map of the Study area

3.2. Survey Design and Sampling

The research is concerned with analyzing the relevance and effectiveness of FTC-based farmer training in Alamata Woreda. Multi-stage sampling procedure was followed to select FTCs from functional FTCs in the woreda and then representative sample households from selected FTCs/ Tabias, including both households with at least a member who attended FTC-based training and those without such a member.

In the first stage, out of 13 Tabia (Peasant Associations) with functional FTCs, 4 FTCs were purposefully selected based on accessibility. In the second stage, the stratified random sampling technique was employed to select sample households from both households with at least a member who attended FTC training and those without. Respective kebeles provided the list of households in each kebele. Households in respective kebeles were categorized into trained and non-trained households with the assistance of local DAs and other local key informants. Finally, a total of 130 households were selected from the respective list of farmers in the selected four PA by using probability proportional to the size technique (PPS). In total, 65 trained and 65 untrained households were selected by means of simple random sampling technique (Table 1). In addition, interviews were held with 14 DAs working at the selected FTCs; and group discussion was conducted with 20 experts of the Alamata Woreda Office of Agriculture and Rural Development.

Table 1. Distribution of sampled households in the study area, Alamata Woreda, 2010

PA list	Total HHs	Sample size		
		Trained	Un-trained	Total
Timuga	2718	25	27	52
SelamBikalsi	1516	14	14	28
Gerjele	1103	11	10	21
Tao	1500	15	14	29
Total	6837	65	65	130

Source own compilation, 2010

3.3. Data Collection Method

To make the data collection process comprehensive and all inclusive, both qualitative and quantitative methods have employed being both complement to each other and supplementing the deficiencies of each in generating the required information to answer the research questions.

Qualitative data were used to supplement and to fill gaps inquired during the quantitative data collection process, particularly at exploratory phase. To identify priority issues to be focused for the formal survey, exploratory study was first carried out. Here the researcher used a checklist. For primary data collection group discussion, key informant interview and informal discussion with farmers, subject matter specialists of the woreda, and development agents were among the sources of information. Based on the knowledge gained through the exploratory phase the formal survey was designed as follow.

Secondary data on the bio-physical, socio-economic and demographic factors of the Woreda were gathered from Office of Agricultural and Rural Development of the Woreda. Additional information about FTC was gathered from woreda, journals, research reports and books.

Semi-structured interview schedule was used to collect primary data from the sampled households about the socio-economic characteristics, institutional factors of the household, the knowledge, skills and practices gained by the trained farmers and their level of understanding in reference to the delivered training. Qualitative data was gathered through focus group discussion, individual interviews with development agents, experts and observations which helped for triangulation as well as to enrich the findings of this study. In addition, brainstorming was conducted with development agents, woreda level experts and local administrative to identify positive deviance FTCs.

To facilitate the data collection process, the interview schedule was developed; pre-tested and finally suitable modification was made by administering on non-sample farmers. The interview was conducted by locally recruited and trained enumerators under the close follow

up of the researcher. Training was offered to enumerators about the ways of approaching the respondents, the way to arrange the interview including the time when, and how to control the interview situation and how to record the information accurately. At the end of the training program the enumerators were made to practice the interview processes by asking each other, in order to ensure their understanding to each question. Furthermore, before launching the actual survey enumerators together with the researcher interviewed a limited number of farmers as part of the pre test. Finally, the actual survey was conducted in the selected Peasant Associations where the sampled FTC is found.

3.4. Data Analysis Method

Based on the objectives of the study and nature of the data available, different analytical techniques have been employed for the composed of qualitative data generated from sample farmers, group interview, focused group discussion, key informants and other relevant sources; encompass tabulation, triangulation, description, interpretation, appreciation of situations, views, perceptions, and reviewing document contents from multiple sources.

Using descriptive and inferential statistics quantitative data obtained from the sample households was compared and contrasted. Descriptive statistics such as, mean, standard deviation, frequency of occurrences, and percentage were employed to assess the relevance and effectiveness training delivered at FTC. In addition inferential statistics such as, chi-square and t-test were employed to compare the trained and untrained farmers' knowledge, aspiration and practices changes. Knowledge test (Teacher-made Test) was used to measure the knowledge of both trained and untrained farmers. Moreover, a Likert-type response format were used to rate positive deviance FTC, the anchors for this scale were (1) disagree, and (3) agree with the middle point on the scale being neutral (2). The whole quantitative data have processed by SPSS version 12.

4. RESULTS AND DISCUSSIONS

In this chapter, the results of qualitative and quantitative analysis that was conducted to address specific objectives of the thesis are presented and discussed. The chapter has been organized into six sections. Sections 4.1, 4.2, 4.3 provide background information on, respectively, Socio-economic characteristics of the sampled households, the situation of the sampled FTCs and training needs implications of analysis of households' livelihood options, constraints and aspirations in the study area. The results of analysis of the relevance and effectiveness of FTC-based farmer training are presented and discussed in Section 4.4 and Section 4.5. The subsequent section, Section 4.6, focuses on the identification and description of positively deviant FTC(s) to see the possibility of scaling out.

4.1. Socio-economic Characteristics of Respondents

4.1.1. Demographic characteristics of the sample households

Age, family size and education

Age is one of the household characteristics important to describe households and can provide a clue as to age structure of the sample and the population too. Both trained and untrained categories have nearly equal mean age. The average age of the untrained sample household is 42.5 years, while trained farmers had an average age of 42.6 years. Age can either generate or erode confidence in new technology and learning new things, that is, with more experience or confidence a farmer can become more or less risk-averse. An independent sample t-test was conducted to test if there is significant difference in the mean age of trained and untrained farmers. The t-value ($t=0.06$) indicates that there is no significant difference between the mean age of trained and untrained farmers.

The number of persons permanently living in a household is referred to as family size. Large households are able to provide the labor that might be required to implement improved agricultural technologies and participation in extension services. As shows in Table 2, the average family size for trained is 5.95, while the average family size for the untrained

category is 4.6. An independent sample t-test shows that the mean difference in family sizes of the trained and untrained is statistical significant difference ($t = -4$, $p < 1\%$).

Education is one of the important indicators of human capital, which increases farmer's ability to obtain process and effectively use agriculture related information, the ability to participate in agricultural activities and the ability for effective use of technologies. In fact, education level of farmers is assumed to increase the ability to use agriculture related information in a better way. In the study area, the education level of farming community is relatively low similar to the national literacy level. As Table 2 shows, from the total trained and untrained farmers about 22.3% and 7.7% of them were formally literate. From Table 2, one can readily conclude that trained farmers were relatively more educated than untrained farmer taking into account their relative proportion to the total sample households. The chi-square test shows that, there is statistical significant difference on education level of the trained and untrained households at less than 1 percent probability level ($\chi^2 = 18.6$). Literate farmers are in a better position to get information and use it in such a way that it contributes in their farming practices. Hence, it was expected to influence training effectiveness on knowledge, attitude, skill and practice change.

Table 2. Demographic characteristics of sample households Alamata woreda, 2010(N=130)

Description	Demographic characteristics			
	Category	Mean\ Percentage	Std. Deviation	T-value
Age of household heads (mean)	T	42.6	8.1	0.06 ^{NS}
	Un	42.5	11.5	
Households' average family size	T	5.95	1.8	-4***
	Un	4.6	1.9	
Heads with formal education (%)	T	22.3	-	$\chi^2 = 18.6$ ***
	Un	7.7	-	

NS- Non significant ***= significant at $P < 1\%$

T- Trained Farmers UT- Untrained Farmers

Source: Survey result, 2010

Household participation in rural institutions or organizations

As presented in Table 3, trained farmers and untrained farmers were involved or participated in different formal rural institution or organizations like development group, tabia food security task member, model farmer, farmers' research group and cooperative. Besides to this, the analysis shows that there is significant percentage difference between trained and untrained emphasizing farmers with respect to the involvement of formal rural institutions or organizations in development group member ($\chi^2 = 3.1$ at less than 10 percent), and also tabia food security task member, model farmer, farmers research group member and cooperative member is found to be significant at less than 1 percent probability level. This shows most of the trained farmers are member of different formal organizations. Since they are members and participants of different organization they may obtain many information and experience related to their livelihood.

Table 3. Distribution of household participation in rural institutions at Alamata Woreda, 2010 (N=130)

Description	Percentage of participation		
	Untrained	Trained	χ^2
Members of development group	20	27.7	3.1*
Member of Tabia Food security task force	9.2	33.1	13.22***
Model farmer	6.9	26.2	21.72***
Member of FRG	9.2	27.7	19***
Member of cooperative	21.5	43.8	28.58***

*** Significant at P<1%

* Significant at P<10%

Source: Own survey, 2010

4.1.2. Farm Household resource endowment

Total land holding

Productive land is a primary source of livelihood for rural households. It was assumed that larger the farm size, higher is the possibility to use a combination of technological packages.

The average land holding of the total untrained sample household was 5.8 Timad, while trained farmers had an average holding size of 7.2 Timad. An independent sample t-test shows that the mean difference in total land holding of the trained and untrained is statistically significant at less than 10 percent probability level ($t=-1.84$) (see Table 4). Probably, households with better holding may further want to intensify their productivity through enhancement

Livestock holding

Livestock in the study area are part of the mixed subsistence-farming complex in which they are closely interrelated with crop farming activities. The majority of the sample households covered by the survey own animals of different kinds in order to produce animal products for food as well as to generate income. Livestock in the area provide inputs like transport and manure to other parts of the farming system and generate consumable or salable outputs like milk, meat, egg, hides and others. People who own livestock can resort to their livestock for source of cash in order to fulfill their needs. Especially, among livestock, small ruminants and chickens are the first to be sold during a serious money shortage period. Donkey and horse also play great role in transportation activities of the rural people.

The average livestock holding of untrained farmers is 4.15 TLU while the average livestock holding of trained HHs is 5.54 TLU. An independent sample t-test was conducted for the comparison of the mean difference in TLU owned between trained and untrained farmers. The result shows that there is statistically significant difference between the two categories at less than 1% level of significance ($t=-2.1$). Probably farmers with different type of animals were

able to apply what they learn or get from the training like natural fertilizer in increasing productivity, fattening, poultry production and other activities etc. Hence, they further give due attention in training participation.

House type

Besides, house type is also one of the proxy indicators used to indicate wealth status of respondents. Individual who have iron-roofed house are assumed to be wealthier than those who have only grass-roofed houses. Wealth status enhances the capacity of individuals to pay for new innovation. If a farmer possess corrugated iron-roofed house, he\she is considered as rich. The finding indicates that about 10.8 % of trained households were living in corrugated iron-roofed house, while 13.1% of untrained were living in corrugated-roofed house. Chi-square test of house ownership between the two groups was run and the difference was not statistically significant.

Radio ownership

Radio plays the greatest role in provision of information in shortest possible time over large area of coverage than other communication channels. The assumption was that respondents who own radio have a higher opportunity of getting agricultural information and use technology than the others. The finding of the study indicates that, out of the total untrained and trained respondents about 11.5 and 22.3 percent were owned radio. The result shows that there is significant difference between untrained and trained HHs who own radio ($\chi^2 = 6.1$, $P < 1\%$) (see Table 4). This implies that farmers who have access to radio were exposed to agricultural information which intern improved awareness. From this result it can be concluded the trained farmers were more expose to any information than the untrained one. Radio ownership is also used to indicate wealth status of the respondents provided that there is no power and transmission problem. Most importantly, these are devices that connect individuals to mass media sources.

This result is line with results reported by different authors (Walday, 1999; Mulugeta, 2000). The implication is that those farmers who have Radio are wealthier and have access to different information that helped them to adopt earlier than those who do not.

Table 4. Farm and household resources endowment of sample households, Alamata woreda, 2010 (N=130)

Farm and household resources endowment	Category	Mean /percentage	Std. Deviation	T value
Households average total landholding area(ha/local unit)	T	7.2	4.7	-1.84*
	Un	5.8	3.1	
Households' average total TLU ownership	T	5.54	3.6	-2.1***
	Un	4.15	2.7	
Ownerships of iron roofed house(%)	T	10.8	-	$\chi^2=0.38^{NS}$
	Un	13.1	-	
Transistor radio (%)	T	22.3	-	$\chi^2=6.1^{***}$
	Un	11.5	-	

*** Significant at P<1% * Significant at P<10% NS- No Significant

Source: Survey result, 2010

4.2. The Situation of Sampled Farmer Training Centers (FTCs)

The entire sample FTCs were established in 2004. The FTC were established with the following objectives:- to train farmers and graduate in green certificates, to conduct on farm and on station demonstrations of agricultural technologies, to enhance the livelihoods of smallholder farmers through transferring and multiplying improved seeds. Each FTC was established to serve from 1103 to 2718 with an average of 1709.25 farm households.

The situations of sampled FTCs were the current and actual performance as compared to others FTCs. It is all about the construction design, its organizational structure, management and requirements for the teaching-learning process; a detail guide line has been prepared and sent to every region by the federal MoARD as an indicator. Some of the indicators expressed in the guide line document are infrastructures to be fulfilled, teaching materials required, number of seats, human resource (number of extension agent needed), governance, planning, implementation, monitoring and evaluation of the training etc. Hence, the assessment was carried.

4.2.1. Infrastructure and facilities

Resources/ facilities availability also vary between the sampled FTCs. All the sampled FTC has buildings with slight variability in internal facilities. With regards to workshop and residences buildings, Gerjalle and Tao are among the better equipped FTCs of the woreda. In terms of physical materials such as chair, table and shelves all FTC are similar. In addition Gerjalle, Tumuga and S/bkalsi FTCs also have modern electronic materials like telephone, TV and DVD which are pertinent for smooth functioning of the training. The sample FTC also has enough facilities for demonstration of crop production, post-harvest, tridle pump, spade, and harrowing and cultivation materials. However, facilities for demonstration livestock production, post-harvest handling and processing such as beef, dairy and beekeeping are very limited. The FTCs have only plastic sheet and high box for livestock related materials. The FTCs also lacks reference material except manual which was brought in training forums and by BOARD at different times.

Table 5. DAs response on inventory of facilities, infrastructure, and resources of the FTC Alamata Woreda, 2010 (N=14)

Type infrastructure	FTCs			
	Gerjalle	Tumuga	S/Bikalsi	Tao
Residence for DA	4	-	-	4
Workshop	1	-	1	1
Office	1	1	1	1
Set for trainer	72	72	72	72
Table	3	4	3	3
Chair for DA	3	3	4	3
Shelf	3	3	3	3
Class room	1	1	1	1
Training materials and visual aids				
Telephone	1	1	1	-
TV	1	1	1	-
DVD	1	1	1	-
Computer with printer	1	1	1	-
Black board	2	1	2	2
White board	10	-	8	-
Reference material	-	-	-	-
Information board	-	1	1	-
Rain gauge	-	1	-	-

Source: Own compilation, 2010

4.2.2. Human resource

The numbers of DA varies from FTC to FTC; in FTCs like Tumuga and Gejalle where there is access to irrigation, one can get 4 DA staff members working in the areas of irrigation, Natural Resource Management, crop and livestock. While in Selambikalsi and Tao only 3 DA are available working in the areas of Natural Resource Management, crop and livestock.

Table 6. DAs response on FTC Human resources Alamata Woreda, 2010 (N=14)

FTC	Number of Development agent	Development agent work experience in year		
		Minimum (years)	Maximum (years)	Average
Gerjalle	4	5	12	7
Tumaga	4	4	12	6
S/Bikalsi	3	4	12	10
Tao	3	1	2	1.5

Source: Own compilation, 2010

DAs work experiences also vary with the FTC proxy to urban area. In FTC like Selam Bikalsi which is 5 km from Alamata town the average DAs years of experience is 10. While in distant FTC like Tao (15km) the average DAs working experience is 1.5 years. As known experience is critical factor for successful knowledge and information flow. Hence, alternative incentive arrangement mechanisms need to be developed for remote areas so as to benefit the whole farming equally. Beside to this, the criteria for recruitment of position of the DA are age, experience and skill while promotion is a function of GPA, performance, efficiency and experiences. With regards to financial management the FTC don't have any financial matter to run except the DA salary which is monitored by the WOARD.

4.2.3. FTCs Governance

FTC is technical backstopped from WOARD Research Extension Core-Process. While management crew is governed by PA chair person and PA rural development head which is the head of the DAs. DAs also have direct contact with their heads and PA chair person on the issues of FTC and agriculture related matters. FTC resources are governed by PA committee headed by chair person. FTC based training is mainly led by DA of each discipline. Besides,

trainee selection is also executed by development agent, peasant association leaders and woreda cabinets.

4.2.4. Training planning and implementation

Short term training at FTC is designed by DA, Woreda and PA administration. Trainee farmer identification is basically based on the DA pre-consumed knowledge of the commodity to be trained. The major objectives set during the training are skill, production, productivity, and technology transfer related issues. Lecture is also the most frequently used training methods while black board and videos are the teaching aids. Training customization is based on cropping season, religion and cultural holly days. Mostly, training is commenced during Sunday and Saturday so as to accommodate most of the farming community need and to use the days which are not allowed to do other farming activities.

4.2.5. Monitoring and evaluation

The purpose of monitoring and evaluation is to improve and achieve efficient and effective program implementation performance by providing feedback to the organization at all levels of implementation processes of a training program. Therefore, it is part of the FTC and Woreda Office of Agriculture and Rural Development management information system and an internal activity, which is performed by the DA responsible for the training implementation at every level of the training program. The mechanisms used by the FTC for continuous evaluation of training during implementation of the program called on going evaluation through immediate assessment using group discussion and collection of individual trainees' comments at the end of training session.

But, so far no FTC has conducted ex-post evaluation so as to assess the positive or negative impact of the implemented program on the situation of target group. This analysis may help the evaluators to assess the overall achievement of a given population due to the implementation of a given program and draw lessons for future planning that is future formulation; implementation, monitoring and evaluation of FTC based training programs.

4.3. Identified and Implied Training Needs of Different Farm Households

4.3.1. Training needs assessment process at the FTCs

Trainers should aim at extending the people's active participation in need assessment through dialogue and discussions rather than only through surveys, questionnaires, and interviews. By involving the people in the process of development rather than just the end product, their critical awareness and their ability to solve problems will be mobilized. Training need assessment is a pre-request for successful and outcome oriented training program. In the study area different formal and informal need assessment methods are used. Data regarding training needs assessment were gathered from trained farmers. The point rose to assess the need base of farmers training programs, whether the farmers need was assessed or not before training.

Table 7. The response of trained farmers on TNA of trainees is summarized in Alamata Woreda, 2010 (N=65)

Item	Response	Frequency	Percentage
Before training	Consulted	5	8.3
	Not consulted	60	91.7

Source: survey result, 2010

As we can see from the (Table 7), most of the trained farmers respond that there was no attempt made to assess their need before the training in all aspect. In general the result of the study indicate that, the absence of any attempt made by the training organizations to practice training needs assessment on a regular and continuous basis, aimed at extending the beneficiaries active participation. Training need assessment is one of the crucial steps towards identifying the area of farmers' interest, design and develop curriculum that can best suit to the existing real conditions of farmers. It is important to remember that participation and involvement of the trainee is an essential part, whatever the method or combination of methods chosen. Moleco and Richard, (1995) underscored the necessity of need assessment stating that: If non-formal education trainers hope to foster meaningful development, they should bear in mind that the needs of adults constantly change. As such it is important for

trainers to possess skills to respond positively to these ever-changing needs. This can be done on by a constant identification of participants' needs.

4.3.2. Training needs implications of the analysis of households' livelihood options, and aspirations

4.3.2.1. Livelihood options and types of training offered at FTCs

Crop livelihood choices and types of training offered at FTCs

Farmers in the study area produce diversity of crop types. Among others crop like maize, sorghum, teff, onion, pepper and barley are the dominant. Despite of this, only maize and onion livelihood choices were found to be influenced by different types of training offered at FTCs. Table 8 shows the relationship between household crop livelihood options and training type offered at FTCs. The number of trained households on maize and onion livelihood choices is found to be relatively higher than that of untrained once. With regards to onion as livelihood choice there is highly statistical significant differences between trained and untrained households on training offered in compost preparation, manure preparation, improved seed use, tillage practices, row planting, irrigation management practices, cropping calendar, use of soil water conservation practices and use of credit at less than 1 percent probability level. This indicates on the importance of training on promoting commercial crop commodities like onion that need intensive agricultural technological interventions. In the other way such commodities are also highly responsive to improve management practices for which farmers are easily persuaded on new interventions being gross margin out weight production costs.

The connection\relationship between farmers access to different training types and maize as livelihood choices show significant difference only on compost and manure preparation trainings at less than 10 and 5 percent probability levels ($\chi^2 = 2.7$ and 4.4), respectively. In general the result of this study shows weak connection between maize, other cereal crops livelihood choices and different types of trainings. Perhaps this could be due to the

insufficient moisture availability of the study area that results in shifting from long duration to short duration and from consumption to commercial commodities like onion.

Table 8. Farmers response on types of training and Crop Livelihood choices Alamata Woreda, 2010 (N=130)

Type of trainings being offered	Livelihood options%					
	Maize			Onion		
	T	UT	χ^2	T	UT	χ^2
Compost reparation	83	60	2.7*	36	14	8.2***
Manure preparation	86	59	4.4**	37	15	8***
Use of improved seed	78	58	2 ^{NS}	43	15	11.6***
Tillage practice	88	51	2.6 ^{NS}	46	17	9***
Row planting	81	63	0.65 ^{NS}	38	18	4.9**
Irrigation water management practices	79	60	0.3 ^{NS}	46	17	9***
Cropping calendar	75	59	0.02 ^{NS}	55	19	7***
Soil Water Conservation Practices	78	60	0.49 ^{NS}	35	13	8.8***
Use of Credit	83	62	1.18 ^{NS}	56	16	9***

*** Significant at P<1% ** Significant at P<5% * Significant at P<10%

Source: survey result, 2010

Livestock livelihood choices and types of training offered at FTCs

Livestock is also important livelihoods option preceded by crop. Small scale dairy, Cattle fattening, Poultry and Beekeeping practices are the common livestock livelihood choices of the study area. However, shoat, small scale dairy and cattle fattening livelihood choices were found to be influenced by different types of training offered at FTCs.

The under mentioned Table 9 shows the relationship between household livestock livelihood options and training type offered at FTCs. Only shoat production, small scale dairy and cattle fattening livelihood choice were influenced by different type of training. With regards to shoat production as livelihood choice there is highly statistical significant difference between trained and untrained households with respect to training offered on forage husbandry, shoat fattening and zero grazing at 5, less than 1 and 5 percent probability level ($\chi^2=3.7, 10.8$ and 5.5), respectively; Whereas in small scale dairy livelihood choice there is significant difference between trained and untrained farmers with respect to training offered on animal

house and use of credit at less than 5 and 10 percent ($\chi^2=5$ and 3.48), respectively. In addition to this, cattle fattening is also as livelihood choice which is only influenced by training offered in stall feeding. The result shows that there is significant difference between trained and untrained respondents with respect to training offered in stall feeding\zero grazing at less than 10 percent probability level. As shows in Table 9 the number of trained households on shoat production, dairy cow and cattle fattening livelihood choices is found to be relatively higher than that of untrained farmers. This indicates on the importance of training on enhancing productivity of their priority options that need intensive agricultural technology involvement. However, the survey result of this study shows weak connection among other livestock livelihood choices and different type of training. This could be due to frequently moister stress and shortage of grazing area that results shift from large ruminant to small ruminant.

Table 9. Farmers response on types of training and livestock livelihood choices Alamata Woreda, 2010 (N=130)

Type of trainings being offered	Livelihood choices								
	Seep and Goat			Small scale dairy			Cattle fattening		
	T	UT	χ^2	T	UT	χ^2	T	UT	χ^2
Forage husbandry	56	32	3.7**	72	52	2.6 ^{NS}	94	86	0.88 ^{NS}
Seep and goat fattening	65	29	10.8***	61	53	0.4 ^{NS}	96	85	1.6 ^{NS}
Animal housing	44	34	0.56 ^{NS}	81	51	5**	100	86	2.56 ^{NS}
Zero grazing	53	30	5.5**	57	54	0.07 ^{NS}	97	85	2.9*
Use of Credit	75	26	20***	58	36	3.48*	99	87	0.4 ^{NS}

NS- no significant *** Significant at P<1% ** Significant at P<5% * Significant at P<10%
Source: Survey result, 2010

4.3.2.2. Priority options and aspiration of sample households

Training is one of the most important instrument for improving practical and imagination/ aspiration of human capacity. To this effect analyzing both the livelihood options and their important goal setting for trained and non-trained households can enable to see the effect of

training on overall human perspective developments. For this purpose farm livelihoods and their important aspirations were identified through group discussion, personal interview, secondary sources and percentage responses are discussed here under.

In the study area crop and livestock mixed farming is the major livelihood options with varying aspiration between households. Among others maize, sorghum, teff, barley, onion, pepper are the dominant crop livelihood options with different livelihood goals. Dairy, fattening and production are also important goals for cattle, sheep goats and poultry livelihood options.

As Table 10 shows, trained and untrained farmers aspires maize for market, consumptions, seed and animal feed with more percent of response than the untrained one. A chi-square test also conducted for the comparison of the significant difference in aspiration or goal of maize between trained and untrained farmers with respect to market, consumption, seed and animal feed. The result shows that there is statistically significant percentage difference on animal feed ($\chi^2=5.24$ at $P<5\%$). Nevertheless there was no significance percentage difference between two groups with respect to market, consumption and seed of maize.

Sorghum is also one of the crop livelihood option and major cereal in the study area. The survey result shows that more percent of the trained farmers were intend sorghum for seed and animal feed. In addition, the analysis shows that there is significant percentage difference between trained and untrained farmers with respect to seed and animal feed objectives at less than 5 percent significance level, perhaps this is could be due to the fact that the majority of the respondents' aimed sorghum and maize for consumption. But, there is no significance percentage difference between trained and untrained farmers with respect to market and consumption. The other major crop livelihood option is teff which is similar with the former crops. From the sample untrained households about 0.8% and 7.7% of the trained respondents aimed for animal feed which is statistically significance at 1% probability level ($\chi^2=7.75$).

In addition, onion is also the dominant cash crop in the study area. About 5.4 and 16.2 percent of the untrained and trained respondents intended for market, but small number of the trained

aimed for seed while none of the untrained farmer planted onion for seed production. The result shows that, there is significant percentage difference between trained and untrained farmers with respect to market ($\chi^2=8.38$) at less than 1% significance level. The probable reason could be due to the short term benefit obtained from tuber than onion seed. But there is no significant percentage difference between trained and untrained farmers with respect to onion production for consumption purpose.

Pepper is also other cash crop livelihood option of the respondent. The result shows that there is no significance percentage difference between trained and untrained farmers with respect to market, consumption and seed. The finding indicates that, generally training has helped them to open and be receptive to modern life style, though training was specific and confined to agriculture or in most cases natural resource management. This indicates that, undergoing training by formal institutions and exposing oneself to the scientific information, helps the individual to aspire, think rationally and seek new scientific information in all aspects of his/her life.

Table 10. Distribution of respondents aspiration on crop option by training categories Alamata Woreda, 2010 (N=130)

Livelihood options	Farmers Important aspirations/goals on their livelihood options (%)											
	Market		χ^2	Consumption		χ^2	Seed		χ^2	Feed		χ^2
	Un	T		UT	T		U	T		U	T	
Maize	6.2	10	1.2 ^{NS}	19.2	25.4	1.57 ^{NS}	7.7	11.5	1.06 ^N _S	6.2	14.6	5.24 ^{**}
Sorghum	6.9	5.4	0.36 ^{NS}	34.6	36.2	0.013 ^{NS}	8.5	16.9	4.47 [*]	3.1	9.2	4.29 ^{**}
Teff	10.8	13.1	0.27 ^{NS}	35.4	39.2	0.5 ^{NS}	3.8	10	3.85 ^N _S	0.8	7.7	7.75 ^{**} _*
Onion	5.4	16.2	8.38 ^{**} _*	0.8	3.1	1.78 ^{NS}	-	1.5	1.97 ^N _S	-	-	-
Pepper	3.1	3.1	0.002 ^N _S	0.8	3.1	1.78 ^{NS}	0.8	-	1.04 ^N _S	-	-	-

*** Significant at P<1%

** Significant at P<5%

Source: survey result, 2010

In the study area livestock farming is also one of the livelihood option and important farming system. The dominant domestic animals reared in the study area include cattle, sheep, goat, chicken donkey, mule, and horse. Sample farmers rear animals for various purposes, including milk, meat, eggs, breeding and draft power and for transportation.

From the total untrained farmers who rear cattle about 13.1% and null while 22.3% and 3.1% of the trained farmers aimed at market and fattening. Majority of the sample households' aspired goal of cattle is mainly for market. Chi-square test was also conducted for the comparison of the significant percentage difference in aspiration of cattle between trained and untrained farmers with respect to market and fattening. The result shows that there is statistical significant percentage difference in aspiration of cattle between trained and untrained farmers with respect to market and fattening, respectively ($\chi^2=4.29$ and $\chi^2= 4$ at $P<5$ and 1%). However, there is no significant difference between trained and untrained farmers with respect to consumption and breeding.

Moreover, farmers in the study area also rear small ruminant for different purpose like market, consumption etc. From the 65 sampled households' who rear small ruminant 8.5% of the untrained farmers' and 19.2% of the trained farmers' aimed at market. The Chi-square analysis shows that there is significant percentage difference on small ruminant between two groups with respect to market ($\chi^2=6.95$ at $P<10\%$), but no significance percentage difference between trained and untrained farmers with respect to consumption, breeding and fattening.

Poultry is also other type of livestock livelihood option of the farmers. Households aimed poultry production for market, consumption and breeding, respectively. The chi-square analysis disclosed that, there is no significant percentage difference between trained and untrained farmers with respect poultry production to market, consumption and breeding, respectively.

Table 11. Distribution of respondents aspiration on livestock option by training categories Alamata Woreda, 2010 (N=130)

Livelihood options	Farmers Important aspirations/goals on their livelihood options (%)											
	Market		χ^2	Consumption		χ^2	Breeding		χ^2	Fattening		χ^2
	UT	T		UT	T		U	T		UT	T	
Cattle	13.1	22.3	4.29**	2.3	1.5	0.24 ^{NS}	6.9	12.3	2.17 ^{NS}	-	3.1	4***
Shoat	8.5	19.2	6.95*	4.6	8.5	1.5 ^{NS}	3.1	3.1	0.002 ^{NS}	-	0.8	0.98 ^{NS}
poultry	13.1	13.8	0.008 ^{NS}	4.6	3.1	0.5 ^{NS}	3.1	1.5	0.77 ^{NS}	-	-	-

*** Significant at P<1% ** Significant at P<5% * Significant at P<10%

Source: survey result, 2010

Farmers' aspiration on yield enhancing factors

As we discussed above, training can help individual to develop and up-grade their goals and skills; to improve their productivity and thereby contributes to raising their families' living standards and well-being. To this effect, analyzing both the livelihood options and how to achieving their important goals for both categories can enable us to see the outcome of training on the overall dimensions of development. In addition, aspirations become a valuable analytical device and a critical entry point for policy relevant to poverty reduction and ultimate socio-economic transformation.

Crop and livestock mixed farming is the major livelihood options of the study area. The following (Table 12) shows that farmers' aspiration on how to enhance their goals in different type of livelihood options. Farmers of the study area who plan to use maize as livelihood option intended to enhance its yield by using input (*seed; fertilizer, herbicides...etc*), SWC¹, land expansion and intensive management practices (*planting date, row planting, intercropping etc.*) with slight difference between trained and untrained farmers. The chi-square test also conducted for the comparison of the significant percentage difference on how

¹ using biological and physical soil and water conservation practices like soil bund, stone bund and agro-forestry practices

intend to achieve their goal on maize enhancing factors between trained and untrained farmers with respect to using the above mentioned yield enhancing factors. But, the result shows that there is no significant percentage difference between trained and untrained farmers with respect to using input, SWC land expansion and management practice.

In addition, sorghum is among the dominant livelihood option in the area. Survey results revealed that, out of the total untrained household only 6.9% whereas about 13.8% of the trained farmers planed to enhance sorghum yield by using management practices. Chi-square test reveals the existence of statistically significant percentage difference on how intend to achieve their goal on sorghum enhancing factors between the two category with respect to management practices ($\chi^2= 3.45$, at less than 10% significant level), but there is no significant percentage difference between trained and untrained farmers with respect to using input, SWC and land expansion, respectively. In addition teff is also another livelihood option. From the total respondents majority of the trained and small number of untrained farmers were planning to enhance teff production by using management practices, respectively. The analysis shows that there is significant percentage difference between trained and untrained farmers with respect to management practices ($\chi^2= 4.29$ at $P<5\%$), although there is no significant percentage difference between the two category with respect to using input, SWC and land expansion.

With regarding to onion about 2.3% of the untrained and 10.8% the trained farmers who plant onion intended to enhance its yield by management practices. The chi-square test also conducted for the comparison of the significant percentage difference on how intend to achieve their goal on onion enhancing factors between trained and untrained farmers with respect to using input, SWC, land expansion and management practice. The survey result shows that there is statistical significant percentage difference in achieving their goal on onion enhancing factors between trained and untrained farmers with respect to management practices ($\chi^2=7.81$) at less than 1 percent probability level.

Table 12. Distribution of respondents aspiration on productivity enhancing factors of crop option by training categories Alamata Woreda, 2010 (N=130)

Crop options	Farmers' aspiration on yield enhancing factors (%)											
	Using inputs		χ^2	Using SWC ²		χ^2	Land expansion		χ^2	Management practice		χ^2
	U	T		UT	T		UT	T		UT	T	
Maize	9.2	19.2	5.84 ^N _S	23.1	22.3	0.11 ^N _S	3.8	5.4	0.3 ^{NS} _S	9.2	19.2	5.84 ^{NS} _S
Sorghum	3.8	3.8	0.003 ^{NS} _S	26.9	29.2	0.11 ^N _S	13.1	15.4	0.22 ^N _S	6.9	13.8	3.44 [*] _S
Teff	5.4	9.2	1.37 ^N _S	27.7	30	0.11 ^N _S	10	5.4	2.35 ^N _S	13.1	22.3	4.29 ^{**} _S
Onion	-	2.3	2.98 [*] _S	3.1	7.7	2.68 ^N _S	0.8	3.8	2.67 ^N _S	2.3	10.8	7.81 ^{**} _S
Pepper	0.8	-	1.04 ^N _S	0.8	2.3	0.97 ^N _S	0.8	0.8	0 ^{NS} _S	2.3	0.8	1.096 ^N _S

*** Significant at P<1% ** Significant at P<5% * Significant at P<10%

Source: survey result, 2010

Beside to this, livestock farming is also one of the livelihood options in the study area. Table 13, shows that, from the total sampled respondents about 23.8% and 2.3% untrained farmers and 32.3% and 8.5% of trained farmers who reared cattle intend to enhance yield using intensification of different animal feed and husbandry practice, respectively. The chi-square analysis also shows that there is statistical significant percentage difference in achieving goal of cattle between trained and untrained farmers with respect to intensification of different animal feed and husbandry practice ($\chi^2 = 5.11$ and $\chi^2 = 4.85$ at < 5% significant level, respectively). Moreover, there is no significant percentage difference between trained and untrained farmers who reared small ruminants and poultry with respect to using breed improvement, increase quantity of live animal, feed improvement and intensive husbandry practice, respectively. In this issue Appadurai, (2001) has clearly explained aspiration, is operationalized as strong desire or an ambition to achieve something better in the life. Moreover, the capacity to aspire, in turn, is a cultural capacity that relates to the manner, in which people visualize the future and engage in forward-looking behavior.

Table 13. Distribution of respondents' aspiration on productivity enhancing factors of livestock option by training categories Alamata Woreda, 2010 (N=130)

Livestock options	Farmers aspiration on yield enhancing factors (%)											
	Using improved breeds			Increase quantity of live animals			Feed improvement			Husbandry practice		
	UT	T	χ^2	UT	T	χ^2	UT	T	χ^2	UT	T	χ^2
cattle	10	9.2	0.095 ^{NS}	6.9	5.4	0.36 ^{NS}	23.8	32.3	5.11 ^{**}	2.3	8.5	4.85 ^{**}
Shoat	2.3	1.5	0.24 ^{NS}	4.6	7.7	1 ^{NS}	4.6	12.3	0.22 ^{NS}	3.1	3.8	0.09 ^{NS}
poultry	2.3	1.5	0.24 ^{NS}	4.6	6.2	0.26 ^{NS}	10	5.4	2.35 ^{NS}	4.6	4.6	0.003 ^{NS}

NS- no Significant ** Significant at P<5%

Source: survey result, 2010

4.3.3. Knowledge-gap assessment

Knowledge assessment process on crop, livestock and natural resources were developed jointly with development agents, and experts based on the ground realities of the study community. Later on discussion were made with different communities till we reach at saturation point. With regards crop knowledge, issues like their level of knowledge on the availability, application rate and importance of land fertility enhancing and productivity improvement practices, agronomic practices, protection and marketing. With respect to livestock, knowledge gap assessment breed improvement, commercialization, feed improvement and husbandry practices were the major ones while knowledge on causes and severities of natural resources degradation and on physical and biological natural resources conservation methods were the major one.

Table 14. Qualitative summary of Knowledge assessment overview

No.	Description of knowledge gap	Knowledge gap target	Identification process
1	Lack of knowledge on inorganic fertilizer rates	DAs and farmers	*Field visit and discussion. DA advices farmers to apply the blanket recommendation rates
2	Lack of knowledge on the economic importance of external agricultural inputs	Farmers	*Discussion. Farmers did not realize the importance of agricultural inputs regardless of DA advices
3	Lack of skill on the preparation and application of organic fertilizers	Farmers	*Discussion. Framers did not apply organic fertilizer in their farmland since they do not have enough knowledge and skill on the preparation of compost and manure
4	Lack of experience on cropping methods and cropping sequences	Farmers, DAs and experts	*Discussion with experts and DAs. Farmers, DAs and experts did not know the appropriate cropping methods and sequences such as crop rotation, plant spacing, inter-cropping, harrowing , etc.
5	Lack of knowledge on different horticultural crop protection management practices in response to the emerging infestations	Farmers, DAs and experts	*Discussion with experts and DAs. Farmers, DAs and experts did not know the new emerging pests and diseases of horticultural crops problems so as to arrange management option prior
6	Lack of knowledge of group marketing	Farmers, DAs and experts	*Discussion with farmers, experts and DAs. Farm product of vegetables like onion and tomato mostly faces market failure due to an organized marketing systems
7	Lack of knowledge on livestock breed improvement practices(AI)	Farmers and DAs	*Field visit and discussion. Local cattle breeds are not improved for betterments of milk and meat yields
8	Lack of experience on livestock commercial orientation	Farmers and DAs	*Field visit and discussion with farmers and DAs. Most of the farmers rear livestock traditionally for re-production and plowing purposes rather than commodity oriented commercialization like dairy and fattening.
9	Lack of experience to improve the feed value of teff and barley straw, and sorghum and maize Stover's by urea treatment	Farmers	*Field visit and discussion with farmers. Most farmer feed their livestock on teff and barley straw, sorghum and maize Stover's as it is and burn the rest hence it is less palatable and helpful/nutritious to animals without treatment.
10	Lack of knowledge and experiences to supplement livestock with alternative feed sources like wheat barn and concentrates	Farmers, DAs and experts	*Field observation and discussion with farmers. Farmers feed their animal only grass or crop residue without additional supplementation which enhance livestock productivity
11	Lack of experiences on improved livestock husbandry	Farmers	*Field observation and discussion with farmers. Farmers handle their livestock with little care for housing and sheltering hence they freely release their animals.
12	Lack of knowledge on causes and severities of natural resources degradation	Farmers, DAs and experts	*Discussion with experts and DAs. The local community did not show any control measures of causative factors of natural resources degradation
13	Lack of knowledge and experiences on physical and biological natural resources conservation methods	Farmers	*Field observation and discussion with farmers. Farmers did not properly manage their farmlands for controlling wind and water erosion

Source; survey result, 2010

Farmers' knowledge on crop commodity was assessed into yield enhancement rated technologies, crop management practices, sequences and crop protection rotation items. Farmers and DAs knowledge gap was assessed qualitatively on consequence based.

Crop production and productivity is a function of different factors among others, use and proper application of organic and inorganic fertilizer is the major one. On this issue farmers knowledge gap on know-how of the availability, preparation and rate of application in reference to the recommended rate was triangulate.

Based on the assessment results most of the study community lacks the rate of inorganic fertilizer application of urea and DAP. As known for the study area 50kg of urea and 100kg\ha of DAP was the recommended rates. But most of the community knows about 10-150kg\ha of urea and 10-100Kg\ha of DAP. This lack of knowledge is emanated due to the gap that was not covered by the concerned bodies of governmental and nongovernmental sectors. Theoretical the concerned DAs and experts' also know that fertilizer application can enhance crop yield for which they are expected to disseminate to the concerned farming communities. But due to lack of outreaches the study community have not showed interest of fertilizers. Regardless of its importance farmers fear the cost for which they are requested to pay. This indicates how far result demonstration missing in which farmers can easily per suited on the importance of fertilizer. Besides to fertilizer farmers are also found lacking knowledge of other external inputs like herb and insect control mechanisms for they are effective in minimizing risk of crop loss.

With respect to livestock knowledge gap assessment breed improvement, commercialization, feed improvement and husbandry practices were the major ones. In the study area breed improvement practice like AI, bull services (Borona bull) and introduction of selected breeds of cattle from western Tigray zone has been started two decades back. As result few farmers especially in the urban and pre-urban areas are now fetching the benefits in terms of milk yield and beef production. However, the dissemination of the breed improvement practices is still unsatisfactory. The basic reason behind this fact is the lack of knowledge of the farming on the importance of such breeds on improving milk and meat yields within a given livestock

growth periods. The reason for such resistance is mainly associated with lack of visible results created on the farming community by the development practitioners of the area. The other reason for such gap in knowledge is associated with the cost and emphasis on livestock number rather than intensifying on specific commodities like dairy and fattening. Surely, such intensification needs depth knowledge on cost benefit analysis and personal commitments.

The other knowledge gap on livestock also relates with feed supplementation and husbandry practices like housing and health. On the study area, isolation of livestock housing and proper sanitation are poorly addressed issues. Construction of separate livestock housing/shelter is not common practices rather farmers thatched animals along sides of their garden fences or they construct small circular structure using thorn where group of animals can stay during night times which is highly exposed to wind, frost and wild enemy.

Numbers of livestock is an indication of wealth and prestige of the study community. As a result major focus is given in livestock quantity rather than qualities. Regardless of the effort made in introducing dairy and fattening practices the available knowledge on such commodity is very poor. Moreover, the community did not know the associated benefits of such practices. As a result the farming community is not gaining from the avail local and international markets of meat and milk industry. To create market opportunities different arrangements are available in the study area for which the study community is not aware.

In reference to knowledge on natural resource issues like cause and consequences of degradation and control measures were traced with regards to this farmers knowledge on the natural and the man made causes of degradation like frequency fallowing, construction of soil and water conservation measure have been assessed. Based on the discussion find that there is wide gap on the cause of degradation in which the farming community perceives in the other ways rather on the consequence to natural host habitation see the above Table 15. For example, ploughing more than five times for a given plot before one season planting is common in which the farming community is considering positive.

For resource degradation there are different options among other planting of trees out sides of the farm as multipurpose agro forestry practices is the major one. Such practice is not common in the study area which emanates from the emphasis give to cereal sole, as source of household livelihood options and free grazing practices. Even, the existences of multipurpose trees for such control option is unknown which needs better emphasis to be addressed by development practitioners of the study area for the benefit of nature.

4.4. Relevance of Farmer Training

The relevance of FTC-based training to the needs and constraints of farm households with different capabilities, resource endowment and with male-headship and female-headship can be assessed from different dimensions. In the first place whether or not the training needs of farm households with different capabilities, resources headship and livelihood options was properly conducted determine the extent to which farmers training addresses diversified needs. Secondly, the relevance of farmers training can be seen in terms of venue, method of delivery and the availability of appropriate audio\visual\non-audio-visual aids, infrastructure and facilities for practical learning. Monitoring and evaluation processes are important to ensure both the relevance and effectiveness training along with appropriate section of trainees.

The first most essential component of the process in developing relevant farmer training program is finding out about the people to be trained and the type of training they need. The issue of developing appropriate content is critical to extension process; the performance of extension systems depends, in large part, on the appropriateness of its message (Campbell and Barker, 1997; as cited in Tsion, 2008). On the other hand, timeliness according to the immediate need of farmers is an important factor (Kefyalew, 2006). If training is to be essential components of designed interventions, a uniform system of research is needed to explain how training is made effective and to indicate how resources for training should be organized.

This section aimed at examining farmers' assessment of the relevance of FTC-based training in terms of attributes that are theoretically known to be determinants of the relevance of not

just the content but also the process of training. Indicators of the relevance of farmer training can be categorized here under, which include:

- i) ***schedule and timing issues***- Timeliness of training, suitability of the timing and the schedule of the training, for trainees
- ii) ***physical environment of the training***- Training environment and teaching aids\methods at FTC, adequacy and quality of training facilities, suitability of the venue and the place where sessions were conducted,
- iii) ***Learning objectives of the training in addressing farmers felt need***- Practices to farmers pressing problems and needs, the extent to which the learning experience reflected and rooted in the local context and indigenous knowledge
- iv) ***Trainer's ability***- Trainers' (DAs) knowledge, practical skills and communication skill of trainers as presented in below tables.

4.4.1. Trainees selection criteria and process

Assessing the method and approaches how the training selection process and actors involved in it, is an important issue to be researched. In the study area the major actors who involve in trainee selection are development agent, local or peasant association leaders and woreda cabinets. Most of the trained respondents were selected by DAs and local administration or Peasant Association leaders jointly, development agent as the sole responsible person for trainee selection. Beside to this about 9.2 % of them also selected by woreda cabinet. There are also farmers who perceived as if they have been selected jointly by development agent and woreda cabinet 4.6%, development agent and local leaders 7.7% as well as by development agent and local administrators.

The other point is the selection criteria for the trainee farmers. In the study area criteria's set for selection is based on different criteria such as blood relation based, farmers educational background based, model farmers' based, Political elites based, farmers interest based and wealth status based. Table 15 shows most of the trained farmers who participate in FTCs based training, respond that the selection criteria of the farmer trainees were based on model farmers', followed by farmers' educational background and political affiliation, respectively,

while about 3% of them react that the selection criteria of the farmer trainees were farmers' willingness and blood relation based. However, none of the respondents point out that wealth status based criteria. As the result shows that, the selection criteria were based on model farmers and educated farmer.

Table 15. The response of trained farmers on trainee farmers' selection process (N=65)

s/n	Actor	Frequency	Percentage
1	Peasant Association leader(PAL)	32	49.2
2	Development agent (DA)	35	54
3	Woreda Cabinet(WC)	6	9.2
4	DA and WC	3	4.6
5	DA and PAL	5	7.7
Trainee Selection criteria			
1	Blood relation based	2	3
2	Farmers educational background based	26	40
3	Model farmers based	37	57
4	Political elites based	4	6.1
5	Farmers interest based	2	3
6	Wealth status based	-	-

Source: survey result, 2010

4.4.2. Training period, duration, and schedule

Timeliness

Timing dimension of training is important, as it can affect the relevance of the training in many aspects. Among the important points under the dimension of farmers training, the convenience of the selected time is on the front line. It is also one of the variables that signify the uniqueness of adult learners. As the farmers for whom the training programs prepared are bounded by a number of responsibilities, which they have to perform in a time frame and the training issues related to suitability of time equally for male and female. Out of the total sample respondents 80.3% of them respond that the existing training was timeliness in terms of delivery with respect to farming activities and rainfall patterns. Of these about 39.4% of them were highly appreciated with the existing training delivery in regards to timeliness. About of 18.3% of them also respond fairly on the timelines of the training. Despite of this about 1.5% of them feel disappointed on the timeliness of the training delivery (see in Table

16 below). This implies that at least to a considerable occasion, the trainings are being conducted in inappropriate times.

Duration of training

Duration can be affect the relevance of the training in many aspects and also setting the appropriate length of the training period is sufficient condition for successful training session. In this regard 39.4 percent of the respondents appreciate the duration of training for which they are satisfied on the program. But about 60.6 percent of the respondents who have been participated in FTC training also perceive irrelevance as compared to what they have been exposed in other training environ (see Table 16). This obviously shows duration of training was not in line with the interest of the farmers but to the interest and provisions of the training resource persons.

CTA working document (2000) categorically suggested that the aim of farmers training is not just to impart knowledge and skills in one-short intensive training courses, but to involve rural people in the development activities through a continuous process of learning week after week. When the training is imparted on daily life related critical activities, it should be continuous and complete well connected to the activities the beneficiaries undertake

Schedule of the training

This is also an instrument used to measure the relevance of farmers training. The dimension of suitability of the schedule of farmers training for both male and female, the convenience of the selected date, time table, the season of the year at which the training was conducted and selects the season of the year for training, are on the front line. In regards to suitability of schedule of the training about 53 percent of the respondent who join in the FTC training were appreciated while about 47 percent of the trained farmers have negatively response on the suitability of schedule of the training for both gender (male and female) as presented in (Table 16).

4.4.3. Training content relevance

Content of the training is one aspect to be considered in the process of human resource development. The decision on the content of the training is highly attached to the needs of the farmers. Conducting needs assessment, on the other hand means knowing the components on which the farmers are willing to be trained.

Practices to farmers pressing problems and needs

Need assessment of the training is one feature to be considered in conducting different training activities. Conducting needs assessment, on the other hand means knowing the components on which the farmers are willing to be trained and practices critical problems of the farmers. With these issues about 34.8 percent of the trained respondents appreciate the practices that pressing problems and needs. Whereas about 65.2 percent of them are not appreciate or fell unsatisfactory on that issues see (Table 16). The result shows that most of the training offered at FTC was not pressed the problems and needs of the households.

The extent to which the learning experience reflected and rooted in the local context and indigenous knowledge

Indigenous knowledge is important for adult learning or farmers training in interpreting or teaching process in order to get active participants. The term local or indigenous knowledge (IK) is used to distinguish the knowledge developed by a given community from international knowledge systems or scientific knowledge (Kolawole, 2001). The teaching and learning process to be active should incorporate the past experience of adults with the new one. Concerning incorporation of farmers' indigenous knowledge to the training, 43.9% of them appreciated; while 56 % were unsatisfactory (see Table 16). The importance of ensuring that new knowledge, concepts, skills or frameworks of interpretation are presented to adult learners in a manner that is comprehensible in terms of their own experiences is a major tool for using participatory learning methods. As Bligh (1992) notes, is useful in presenting information in short. As a host of research studies cited by Bligh indicate, however, that the

lecture is of little use if the educator or trainer is seeking to promote critical thinking or to encourage adults to be more flexible in their attitudes.

Table 16. Trained farmers response on relevance of FTC training on timing issues and contents Alamata Woreda, 2010 (N=65)

Relevance of training activities/process	Very good	Good	Fair	Poor
Period, duration and schedule				
Timeliness of training	39.4%	40.9%	18.2%	1.5%
Duration	30.3%	9.1%	22.7%	37.9%
schedule of the training	15.2%	37.9%	34.8%	12.1%
Training content relevance				
Practices to farmer pressing problems and needs	6.1%	28.8%	37.9%	27.3%
Incorporation of farmers IK	12.1%	31.8%	42.4%	13.6%

Source: Survey result, 2010

4.4.4. Training environment and facilities

Selecting the appropriate training material/aids, venue and facilities for demonstration are as important as training schedule and timing. One of the requirements for the teaching-learning process is the fulfillment of teaching materials. As depicted in table 18, in this issue most of the respondents appreciate the training materials used at FTC in transferring the planned training objectives. While a few of them feel not relevant on the materials/aids used at FTC training during the training sessions to deliver the desired knowledge. The participants mentioned that, in most of the FTCs use the training material during training session, but some of the FTCs have limited skill of DAs in using computer during period.

Adequacy and quality of training facilities

Adequacy and quality of training facilities are essential for farmers training or adult learning. Selecting an appropriate training material and method is perhaps the most important step in training activity once the training contents are identified. It is also good to use a variety of training materials and methods throughout a training to maintain the interest of the trainees.

To achieve the training objective, a trainer should select the most adequacy and quality of training facilities for the content to involve the trainees in the learning process. Regarding this issue a few number of the respondent has positive response on the quality of training facilities, where as a majority of the HHs who participated on FTC training, were reflected negatively with adequacy and the quality of training facilities see table 18.

Venue of training

As farmers' training is dealing with experienced adults, the place at which the training is offered will have great impact. The response of trained farmers on the suitability of venue or place of training is summarized in Table 18. During the theoretical training session FTC based training is conducted in a class room designed for this purpose. In most of the Tabia carrying of the FTC class room ranges 70 to 72. A presented in Table 18 of the trained farmers 93.9 percent of them appreciate and feel relevant and convenient with the venue while the rest of them disappointed with the venue where the training is delivered. Most of the studies FTC are said to be accessible to their villages and ability to accommodate all participants perhaps this might be the reasons given for convenience of the training.

4.4.5. Facilitators

Training resource persons

As presented in the Table 17 below, in the study area beyond the development agent the FTC based training is also delivered by woreda experts, regional bureau experts and local administrations. In this regard 30.8 percent of them react that they trained by woreda expert. While about 24.6 percent and 23 percent of the respondent who participate in FTC based respond that training were delivered by regional bureau expert and local administrative bodies, respectively.

Table 17. Trained farmer's response on training resource persons Alamata Woreda, 2010 (N=65)

S\N	Resource persons	Frequency	Percentage
1	Woreda experts	20	30.8
2	Experts from Regional Bureau	16	24.6
3	Local administrative bodies	15	23

Source: Survey result, 2010.

Knowledge of the trainer

Knowledge requires a theoretical or practical understanding of a subject. Agricultural knowledge implies knowledge about the contribution of agriculture to the overall economy and to the way of life of the society. Based on composite indicators of the DAs like practical and communication skills the respondents reply that most of the trainers were technically skilled, familiar with local situation and they have rural and/or farming background. Concerning the issue about 72.7% of the trained farmers have positive response on the knowledge of trainers, but 27.2 percent of the farmers who participated in FTC training did not appreciate the knowledge of trainers (see Table 18).

Practical farming skills of the trainers (DAs)

In this study, the Practical farming skill of trainers as a resource person and their interaction with the farmer trainees was also investigated. Regarding this issue of practical farming skill of trainers about 59% of the respondent have positive reaction, while 40.9% of the trained HHs have not appreciated the practical skill of the trainer. This implies that skill of facilitator could be one concern, solely assisting adults to meet those learning needs that they themselves perceive and express as meaningful and important.

Communication skill of the resource person

Concerning the resource person's communication skill, among the total trained HHs 74% was appreciate the resource person's skill of communication which means communicate clearly. While the rest about 25.7% trained farmers were not appreciate the communication skill of the resource persons (see Table 18). Instead, a resource person is often seen as someone who assists adults to locate individuals and material resources in order that they may complete learning efforts that they, as learners, have defined. This view emphasizes the primacy of the learner; grant a substantial measure of control to learners, and places learning directly in the context of learners' own experiences (Sullivan, 1998).

Table 18. Trained farmer assessment of relevance of FTC based training on physical environment and facilitators ability Alamata Woreda, 2010 (N=65)

Relevance of training activities/process	Very good	Good	Fair	Poor
Physical environment of the training				
Training environment and Teaching Aids at FTC	12.1%	39.4%	31.8%	16.7%
Suitability of the venue and the place where sessions were conducted	66.7%	27.3%	4.5%	1.5%
Adequacy and quality of training facilities, particularly for practical sessions	24.2%	16.7%	28.8%	30.3%
Trainer's ability				
Knowledge of the trainers (DAs)	37.9%	34.8%	22.7%	4.5%
Practical farming skills of the trainers	22.7%	36.4%	36.4%	4.5%
Communication skill of the resource person	34.8%	39.4%	22.7%	3%
Follow-up and regular evaluation	7.6%	7.6%	25.8%	59.1%

Source: Survey result, 2010

4.4.6. Mode of delivery (training approach, processes and methods)

Training Methods

In training delivery choosing the proper teaching aids and methods of delivery are paramount important. A training programme has a better chance of success when its training methods are carefully selected. There are a variety of methods and techniques for conveying information

to trainees, but not all of these are equally suitable for all topics and in all situations. Table 19 displays farmers' responses on teaching methodologies used during training session. In this regard class room lecture, visiting demonstration fields, group discussion, field practices and visiting model/exemplary farmers field are the major methods used in the study area. From the total trained farmers' most of them were mentioned class room lecture and visiting demonstration fields are the dominant training methods in the study FTCs. Group discussion and field practices were also the second commonly used teaching methods respectively. Only 3% of the respondents point out, visiting model farmers as means of teaching methods. With regards to importance, respondents indicate that the class room lecture, field practices and visiting demonstration fields are all important at varying degree, although some discrepancy was observed, most of the respondents were appreciate visiting demonstration fields and field practices, respectively as the most suite methods in addressing the outcomes of the training. According to the survey data presented in this study, field practice training and visiting demonstration fields was found to be the most appropriate methods for effective training. Classroom session followed by group discussion and visiting model farmers are the second, third and the fourth important methods in addressing farmers' knowledge gap. Only very few respondents seemed to prefer class room lecture, group discussion and visiting model farmers' methodology see Table 19. A training method is a strategy or tactic that a trainer uses to deliver the content so that the trainees achieve the objective (Wentling, 1992; cited in Mahlangu and Sekgota, 2005). Different training methods can be used to achieve the objectives of a particular training.

In addition, skill orientation of the training process is an instrument used to measure the relevance of training methods. In this case, combination of theory and practice in training is essential to better improvement. Training methods compresses 30 percent theory and 70 percent practice is behaved to enhance the capability of individual trainees.

The relevance of training process in terms of skill orientation was assessed based on different categories (crop, livestock NRM and rural institution) of training delivered at FTCs in 2009G.C. As depicted in Appendix Table 2 most of the trained farmers respond that the training which offered at FTCs were highly theoretical rather than practical. In general most

of the training was highly theoretical and lecture type of methodology hence, redirecting in mixing both theory and practice should be future assignment.

Table 19. Trained farmers' response on methods of the training and its importance Alamata Woreda, 2010 (N=65)

S/N	Training methods	Exposed to farmer during training session		Importance	
		Frequency	%	Frequency	%
1	Class room lecture	31	48	7	10.7
2	Visiting demonstration fields	31	48	31	48
3	Group discussion	11	17	6	9.2
4	Field practices	11	17	30	46.1
5	Visiting model farmer	2	3	5	7.7

Source: survey result, 2010

Follow-up and regular evaluation

Among several phases of training, evaluation is a process to determine the relevance, effectiveness, and impact of activities in light of their objectives. In these regard the result showed that about 15.2% of the trained farmers responded positively, while 84.9% were negatively reflected on follow up after the training (see Table 18). Unfortunately, the general discussions made with trained farmers indicated that there were no expose follow-up activities after training. The probable reason for not conducting evaluation of the training could be lack of a systematic needs assessment that can guide and serve as the basis for the design, development, delivery, and evaluation of the training program. Moreover as found in many other organization in Ethiopia (Kefyalew, 2006 Ousman, 2007 and Tsion, 2008), the training organizers might not consider its value in completing the training process and end up conducting the training. Thus Raab *et al.*, (1987), define training evaluation as “a systematic process of collecting information for and about training activities which can then be used for guiding, decision making and for assessing the relevance and effectiveness of various training components. Raab *et al.*, (1987) demonstrated that there are three phases of a training process such as planning, implementation, and evaluation. Absence of training evaluation phase from the FTC based training program, therefore, could lead to lack of information on the immediate

results of the training activities. Also, Tyler (1971; cited in Tsion, 2008) perceives follow up of training as a mechanism for the analysis of the relevance and effectiveness of the objectives.

4.5. Effectiveness of Farmer Training

4.5.1. Knowledge change (acquired)

Training is the most important approach for generating and changing in Knowledge and capabilities. In addition, it is helped the farmers to change their attitude towards improved agricultural practices and living. Knowledge of the trained and untrained farmers was measured using a “Teacher-made type test” containing relevant items. Item selection for the test was done using similar procedure as indicated above. The test items included questions related to basic aspects of rural household lives such as crop production, livestock management, natural resource management, family planning and gender issues.

Table 20. Levels of knowledge of trained versus untrained farmers Alamata Woreda, 2010 (N=130)

Knowledge Scale	Untrained Farmers		Trained Farmers		χ^2 (p-value)
	Number	%	Number	%	
Low(0-13)	55	42.3	0	-	105.99 (0.000)***
Medium(14-26)	10	7.6	17	13.1	
High(27-40)	0	-	48	36.9	

Source: survey result, 2010

*** Significant at <1% of probability level

Though there were 17 questions, some of them were seeking multiple answers, and hence total 40 answers were expected. The answers were of nature specificity to avoid any ambiguity in scoring. The scoring pattern was 1 score for correct answer and 0 score for wrong reply. The respondents were asked the question and the answers were recorded. Later these answers were evaluated and their total knowledge scores were calculated.

As depict in the above Table 20 the knowledge score of the trained household ranges from 14 to 40 with an average of 30.01. While the score of untrained farmers' ranges from 0 to 15

with an average of 8.73. To see the effect of training on knowledge change first farmers knowledge was ranked as Low, high and medium orders with total knowledge scores ranges of 0-13, 14-26 and 27-40, respectively. The result of the knowledge test shows that, most of the untrained sample households are under the low and a small number of them were under medium knowledge categories whereas few numbers of the trained respondents are under medium and majority of them are under high knowledge categories. Chi-square test also conducted for the comparison of the significant percentage difference in knowledge test between trained and untrained respondents with respect to low, medium and high knowledge level. The result of the chi-square test shows that there is highly significant percentage difference in knowledge score between the trained and untrained respondent ($\chi^2=105.99$, $P=0.00$). Generally, when we assessed the knowledge of the sample households who have different know how on the items, that is trained HHs were more aware than the untrained farmers. For instance, farmers respond that the rate of DAP for crops in hectare ranges from 10-100Kg, whereas the rate of Urea for crops in hectare also ranges from 10-150kg. In this case, most of the trained sample HHs responds that the correct answer which is 100kg of Dap and 50kg of Urea for crops in hectare respectively. While from the total untrained farmers a small number of them were accurately react.

As can be seen from the Table 20, knowledge test indicated that the trained farmers had better level of knowledge when compared to the untrained farmers. The result also implying that the trained farmers have better practical and theoretical know-how and related human relation and livelihood enhancement arenas. The results of the study are in line with the findings of Babur (2009), who reported that knowledge of coffee management practices of members of Farmer Field School was higher than the non members. Perhaps this difference could be the attributes of farmer to farmer experience sharing during and after training sessions, exposure visit, and result and method demonstrations. As a result the number of farmers adopt improved agricultural practices is increased. For instance before training commencement most of the farmers were not aware of compost preparation, row planting and cultivation of commercial oriented horticultural crops etc while currently most of them are able to justify on such farm management practices.

Moreover, the perceived impacts of the training shows quite promising and long are lasting. On this issue, training can inspire people for a better life and notices that enable to enhance production, income and better improvement on their overall life. In order to achieve the best results farmers need to be aware of the real situation on adult learning. The experts also seemed to be able to transfer the required levels of knowledge for a specific technology, which is the key factor to implement extension packages.

4.5.2. Skill change

Training is the main instruments available to prepare individuals for a rapidly changing, increasingly demanding of work and to improve their capability. It is also important tools for assisting government officials, development personnel, extension experts and agriculturalists in the realization of their program objectives and plans. Often we are faced with the need to change something or to implement a new way of doing something. Hence, generally assessment of indicators of training process is most important for effective training. Based on these indicators of skill change on crop, livestock and natural resource related technology training were summarized in Table 21 below. As can be seen from the Table during the last one year about 10 major areas of crop training have been carried out at FTCs. Most of the trained households were skilled on preparation of compost and manure, use of improved seed, timely weed and pest management practices, tillage practices, proper fruit husbandry and irrigation water management practices (timing and scheduling). Regarding livestock of training 11 major areas have been executed at FTCs. As can be seen from table 21 a number of the farmers skilled and practiced on forage husbandry, cattle fattening, sheep and goat fattening, dairy production, poultry production and stall feeding/zero grazing respectively. Whereas in NRM training majority of the farmers who participated in FTC based training are found to be capable in soil and water conservation practices, followed by forest management practices. However in rural institution training most of the trained respondents were functionally applied or practiced on use of credit and use of family planning, respectively. From this one can conclude important role of FTC based training improving the levels of capability and application of the scientific principles in different agricultural technology.

Table 21. Trained farmer's response on effectiveness of training in skill change Alamata Woreda, 2010 (N=65)

S/N	Skill Change	Frequency	Percentage
Crop production technologies			
1	Preparation and application of compost	26	40
2	Preparation and application of manure	36	55.4
3	Use of improved seed	27	41.5
4	Use of inorganic fertilizer	13	20
5	Timely weed and pest management	26	40
6	Tillage practices	20	30.8
7	Proper fruit husbandry	25	38.5
8	Row planting	11	16.9
9	Irrigation water management(timing and scheduling)	21	32.3
10	Proper cropping calendar	9	13.8
Livestock production technologies			
1	Forage husbandry	12	18.5
2	Cattle fattening	18	27.7
3	Sheep and goat fattening	9	13.8
4	Livestock housing	5	7.7
5	Dairy production	14	21.5
6	Poultry production	12	18.5
7	Beef production	2	3.1
8	Modern beehive	4	6.2
9	Stall feeding/zero grazing	20	30.8
10	AI services	5	7.7
Natural Resources Management			
1	Soil and water conservation practices	52	80
2	Forest management practices	12	18.5
3	Nursery management practices	5	7.7
4	Improved stove use	5	7.7
Other social issues			
1	Use of family planning	21	32.3
2	Use of Credit	15	23.1

Source: survey result, 2010

In general, the knowledge, aspiration and practice test clearly indicates that training significantly improved knowledge of farmers, aspiration towards different livelihood options and application of technology related to different agricultural production system.

4.5.3. Effectiveness of FTC based training on agricultural technology adoption and practice change

Practice is operationalized as the application of knowledge acquired from the training. It is the transfer of learning. Practices of farmers were evaluated based on their responses on the application of recommended technologies. As shows in Table 22 majority of the trained farmers have notice better improvement in their overall behaviors towards the external worlds of development, interpersonal communication, enhancement in group solidarity for collective resource managements saving habit enhancements and also improvement in quality production, respectively.

In addition to these, most of the trained farmers and a small number of the untrained respondents also notices enhanced in improved seed adoption, inorganic fertilizer adoption, herbicide/pesticide use, breed improvement, fodder adoption and veterinary service, respectively. However, trained farmers are better adopters and practiced of technology than untrained farmers. Chi-square test also conducted for the comparison of the significant percentage difference in practice change between trained and untrained respondents with respect to improved seed adoption, inorganic fertilizer adoption, herbicide/pesticide use, breed improvement, fodder adoption and veterinary service. The result shows that there is highly statistical significant percentage difference at less than 1 percent probability level (see Table 23). The probable reason for the difference in significance could be due to the training effectiveness brings know how and practices change towards the technology. This area of human resource development is quite pertinent for improvement of the quality of life of the grass root farming communities. This was in agreement with the findings of Babur (2009) who stated that the management practices of coffee by FFS member farmers were significantly higher than those of non-FFS member farmers. To see the impact of training on farmers' practices comparisons were made using chi-square tests on different technologies

promoted by the extension system during that specified cropping calendar. Summary of the result of trained and untrained farmers' response on the introduced practices is presented here under.

Table 22. Trained farmers' response on interpersonal development Alamata Woreda, 2010 (N=65)

S/N	Change in practices	Percentage responses
1	Behavioral change	46.2
2	Interpersonal communication skill	18.5
3	Collective action enhancement	20
4	Saving habit enhanced	26.2
5	Quality production improvement	41.5

Source; survey result, 2010

In the study area extension service are common on credit, crop technologies, livestock technologies, improved livestock, household packages, improved seeds, inorganic fertilizer, herbicide/pesticide, improved breeds, fodder technologies and veterinary services. According to the survey result majority of the trained with small number of the untrained farmers were beneficiaries of credit services. The facilitation of credit is also very weak or even absent in the past. But recently the situation is showing improvement and the credit facilitation is better. In this case, there is a statistically significant difference between the trained and untrained households from each other ($X^2 = 4.74$, $P < 5\%$) indicating that training is an important development mix in bringing positive behavioral and practices change towards credit.

Table 23. Distribution of respondents on technology practice change Alamata Woreda, 2010 (N=130)

S/N	Practices changes/ adopted	Trained	Un trained	χ^2
1.	Credit	15.5	7	4.745**
2.	Improved seed	42.3	24.6	16.31***
3.	Inorganic fertilizer adoption	17.7	8.5	5.25**
4.	Herbicide/pesticide use	43.1	21.5	24***
5.	Breed improvement	21.5	6.2	14.53***
6.	Fodder adoption	23.1	10.8	8.068***
7.	Veterinary service	41.5	25.4	13.44***

*** Significant at $P < 1\%$

** Significant at $P < 5\%$

Source; survey result, 2010

4.6. Exploration of Positive Deviance case among the Studied FTCs

The term positive deviance refers to ‘a departure from the norm’ which results in a positive outcome. Our measure of positive deviance is based on the definition of positive deviance which we have adopted from Speritzer and Sonenshein (2004). The authors define positive deviance as: “Intentional behaviours that significantly depart from the norms of a referent group in honourable ways.” The two key concepts for understanding and analyzing positive deviance are ‘departure from the norm’ and ‘intentional behavior’. The former suggests that positive deviance involves a departure from the norms of a referent group with some visible indicators often unexpectedly. The second, intentional behavior underlines that the positive deviance ought to be voluntary, purposeful, and discretionary.

In this research context, positively deviant FTC is the one that performed better than the other FTCs regardless of similar problems and resource base. Of the four sampled FTCs Gerjalle, Selambikalsi and Tumuga are supported by IPMS as a result they are more resourceful in terms of communication facilities like computer TV and wire less telephone. However, all the 4 FTCs attended the training organized by IPMS. Background information on each FTCs establishment, resources, activities, governance, linkages and partnership, etc were collected; and individual interviews and group discussion were conducted with DAs and document review were employed to identify and characterize any positive deviance case.

Secondly, brainstorming was conducted with experts at woreda office and local administrations representing, respectively, supervising body and part of FTCs management body. The discussion was held to elicit their views as regard to which FTC and in what respect might represent a special case among the studied four FTCs. The dimensions of the FTCs considered during the discussion included factors such as resource governances, linkage with both governmental and non-governmental actors/organizations, client-orientation in training design, delivery, monitoring and evaluation, actual and/or perceived impacts of the training in addressing practical needs of different categories of farm households in their respective kebeles. Further, discussion was held with other key informant farmers to compare

and contrast the FTCs from the same area, which are working to address more or less similar challenges with comparable physical, financial and other resources. The brainstorming and group discussion process helped to understand the key practices of each FTCs and to highlighted and analyze the perceived superior results of the respective FTCs.

On the basis of data from interview and the participatory processes, activities (both conventional and non-conventional) of the FTCs were differentiated, categorized and contrasted to explore into the existence of any departure from norms (expected/conventional roles and performance) and whether the departure that might exist was desirable of ‘an honorable nature’. A list of set of behaviours perceived deviating positively and substantially from norms or the expected roles and/or performance of FTCs were singled out and attempt was made to learn about what exactly made the deviants successful.

Finally, a Likert- type response format was used for rating FTC in the positive deviance analysis. The anchors for this scale were (1) disagree, and (3) agree with the middle point on the scale being neutral (2). The instrument employed for assessing positive deviances were refined with the relevant experts before actual application. The instrument was designed to capture the extent to which the respondents agree or disagree to each item with reference to each FTC. To understand whether a departure from norms has occurred, it is important for a respondent from the appropriate referent group to rate the behavior. In our case identifying positive deviance among the FTCs involves a unit departing from the office of agriculture and rural development, hence the final rater were experts from the Alamata Woreda Office of Agriculture and Rural Development who are engaged in a continuous assessment of activities and performances of each of the FTCs and those who also understand the norms regarding FTCs. Besides, the input of each DAs collected during FTC survey was instrumental for the final rating of the deviance FTC.

According to the result (Table 24), S/Bikalsi FTC has been found a positive deviant. About 97 percent of the respondents agreed that the outputs of S/Bikalsi FTC was positively and substantially different from outputs of the other FTCs. S/Bikalsi FTC outperformed as reflected in indicators such as its diversified and substantial training outreaches, better credit

access, effective use of technology, and high repayment rates among its clients , successful promotion of commercial vegetable production and fattening, better cattle breeding service provision (exotic bull service) well designed demonstration fields of the FTC, large and increasing number of improved technology adoption among its client farmers. Further, more than 85 percent of the respondents agreed that the outstanding performance of S/bikalsi FTC was resulted from intentional behavior, did not happen by chance.

In the second place, about 58 percent of the respondents agreed that Tao, although established relatively late and got less support, also represents a substantial departure from the remaining FTCs. Among others, in its training outreach and the quality of demonstration field management incorporating new crops like jathropha, moringa and different fodder banks are some of the indicators of recognizable norms of the FTC.

The result with regard to Gerjalle FTC is mixed. Although 52 percent of the respondents perceive favorably the relative performance of Gerjalle FTC, more than 50 percent of the respondent disagreed that the performance represents a substantial departure and expressed some reservation as regards to the FTC sustainability indicators.

This is witnessed by the availability of field demonstration of commercial crops and forage multiplications, the availability of family drip systems and water reservoirs built by the community mobilization and the availability of physical and biologically soil and water conservations are some of the indicators for the existence of intentional actions. In this regard about 75 and 55 percent of the respondents also agreed on the intentional actions of Gerjalle and Tao FTCs, respectively. However, more than 50 percent of the respondents also agree that Tumuga lacks the element of intention from all stakeholder, the indicators for such responses were justified by the absences of representative field demonstration sites and supporting infrastructures.

The third criteria used to characterize positive deviance FTC was the performance represent an honorable nature beyond the ambitions of the FTCs actors. To capture this issue indicators and certificate offered by the woreda to the FTCs were assessed. Based on the document

assessment and experts rating of the sampled FTCs about 95 percent of the respondent agreed on the performances of S/bikalsi as an honorable nature than the rests of the woreda FTCs. To verify this response we also get some important indicators of honor and prizes given to it like the modular training graduation and the certificate they obtained before 4 years. In this regard, about 65 percent of the respondents also pointed out on the performances of Tao FTC as an honorable nature. However, more than 50 percent of the respondents disagreed on the performances of Tumuga and Gerjalle to be honorable nature in their performances.

Table 24. Experts levels of agreement on the analysis of Positive deviance FTC Alamata Woreda, 2010 (N=20)

S / N	Items used to measure Positive Deviance	FTC				
		Level of agreement	Gerjalle (%)	Tumuga (%)	S/Bikalsi (%)	Tao (%)
Departure From Norms						
1	The behaviors/ outputs described in the FTC (training, technology dissemination, loan repayment etc)/ significantly departed from other FTCs	Disagree	20	25	-	5
		Neutral	35	45	-	20
		Agree	55	35	100	75
2	The FTC out smarts/acted in a way that was not expected	Disagree	5	5	-	30
		Neutral	55	45	5	25
		Agree	40	40	95	45
3	The actions of the FTC did not represent "business as usual."	Disagree	30	65	-	5
		Neutral	10	25	-	30
		Agree	60	10	100	65
Intention						
1	The behaviors/outputs described in the FTC (training, technology dissemination etc) were intentional rather than happening by chance.	Disagree	15	30	-	5
		Neutral	10	25	15	45
		Agree	75	45	85	55
2	What occurred happened in the FTC (training, technology dissemination, loan repayment etc) by accident	Disagree	10	30	10	25
		Neutral	25	25	5	35
		Agree	65	45	85	40
3	The DAs, administrators and stakeholders in the FTC acted voluntarily rather than being coerced by others.	Disagree	5	10	-	10
		Neutral	30	15	10	45
		Agree	65	75	90	50
4	The actions of the FTC were discretionary/open/unlimited.	Disagree	5	10	-	10
		Neutral	30	15	10	45
		Agree	65	75	90	50
Honorable Nature						
1	The outputs described in the FTC (training, technology dissemination, disbursement loan repayment etc)/ in the episode/FTC were honorable.	Disagree	25	55	-	15
		Neutral	30	5	5	20
		Agree	45	40	95	65
2	The actions of the FTC could be characterized as virtuous.	Disagree	25	55	-	15
		Neutral	30	5	5	20
		Agree	45	40	95	65
3	The FTC outputs described in the FTC (training, technology dissemination, loan repayment etc) / episode could be described as ennobling.	Disagree	30	35	-	20
		Neutral	25	55	5	15
		Agree	55	5	95	65
4	The FTC performance is honorable	Disagree	25	55	-	15
		Neutral	30	5	5	20
		Agree	45	40	95	65

Sources: own compilation, 2010

Knowledge and information Network

The DAs stationed at FTCs besides conducting farmers training and technology demonstration, they facilitate various field level activities relating to extension, on-farm research, mobilization, organization of farmers, input delivery, services provision by various state and non-state actors. DAs are supported by both public and non-governmental organization in different areas of their daily activities. Hence, actors' description is an important issue to know positively deviant FTCs. Description of the actors and their roles in the FTC is primarily based on information collected during the appraisal with DAs and the FTC management bodies. The public actors such as zonal and regional bureaus of agriculture and rural development, Alamata agricultural research center, EIAR, Maichew ATVET and Mekelle University are the important sources of Knowledge and information of the FTCs. IPMS project and World Vision are the major external supporters of the FTC in capacitating the FTC both financial and infrastructures. From the total sample FTCs Tumuga, S/bikalsi and Gerjalle have been supported by IPMS. In Tumuga, S/bikalsi and Gerjalle FTCs IPMS have invested in capacity development activities such as information and infrastructure development to improve connectivity of the FTC, knowledge sources, equipping the FTCs by providing communication, audio-visual equipment, on job training as well as organizing and covering different educational tours. The facilitation and capacity development role of IPMS is pivotal.

At FTC level, PA administration is an important actor in mobilizing farmers for collective actions like natural resource rehabilitation and management, encouraging farmers' participation in extension packages, organizing and supporting cooperatives. Beside, farmers' organizations like Shewit cooperative and privet firms are also important actors in supporting the FTC. In general Selambkalsi has a better linkage followed by Gerjalle FTC and Tumuga with different sources of finance, information, knowledge and technologies (see table 25).

Table 25. DAs response on FTC organizational linkages Alamata Woreda, 2010 (N=14)

Organization linked with	FTC			
	Gerjalle	Tumuga	S/bikalsi	Tao
Ethiopian Institute of Agricultural Research	Formal	-	Formal	-
Alamata Agri.reseach Center	Formal	Formal	Formal	-
Public extension services (Federal)	-	Formal	Formal	-
Public extension services (Regional)	Formal	Formal	Formal	-
Public extension service (Zonal)	Formal	-	-	-
Mekelle university	Informal	-	Informal	-
Foreign technical assistance (projects)	Informal	Informal	Informal	-
Maichew ATVETs	Informal	Informal	Informal	-
Private firm (Solomon)	Formal	Informal	-	-
IPMS	Formal	Formal	Formal	Informal
World Vision	-	Informal	Formal	-
DECSI	Formal	Informal	Formal	Formal
TAMPA	-	-	Formal	-
IFAD	-	Formal	-	-
Farmers organizations or coop (specify)	Formal	Formal	Formal	-

Source: Own compilation, 2010

Training outreaches of the FTCs

The very objective of FTC establishment was to upgrade knowledge and practical skills of the farming households and to avail agricultural information and technical support so as to positively contribute for agricultural development of its mandate area. During 2009/2010 production season, each FTC has offered training activities in the area of crop, livestock, natural resource management commodities and related issues. The durations of the training varies based on the content and complexity of the topic to be trained. Major areas of the training were soil and water conservation, household package, compost preparation, livestock fattening, credit, fertilizer usage, agronomic practices such as row planting, irrigation and livestock feed managements on urea treatment and urea molasses blocks etc. Target beneficiaries of the training vary from commodity to commodity and from FTC to FTC as well.

As Table 26 shows, Selambikalis FTC has performed relatively much better interns of outreach and gender sensitivity in training. For instance, of the total 1516 farm households

86% of MHH and 47% FHH were beneficiaries of the training delivered in crop commodities. Similarly, about 65 and 46 percent of MHHs were trained in livestock and natural resources commodities, respectively. While about 53% and 28% of the FHHs were also trained in livestock and natural resources related commodities. Toa FTC is also the second efficient FTC in crop technology related training with 85% of the MHHs and 17% of FHH training out reaches. Toa is also second in terms of NRM training with 28% MHH and 14% FHH out reaches and third with respect to livestock training that cover about 63% MHH and 10% FHHs.

Table 26. DAs response on trainings offered in agriculture and rural development in the past 12 months at FTC Alamata Woreda, 2010 (N=14)

Training subject	Percentage of Trainee Categories by sex and FTC							
	Gejalle		Tumuga		S/bikalsi		Tao	
	M	F	M	F	M	F	M	F
Crop	30	2.1	57	3.2	86	47	85	17
Livestock	9	2	67	14	65	53	63	10
NRM	14	4	1.8	0.07	46	28	28	14

Source: own compilation, 2010.

In regards to livestock commodity training outreach Tumuga is the second next to Selambikalis with 67 percent MHH and 14 percent FHH beneficiaries while it is the fourth with respect to NRM that covers 1.8 percent and 0.07 percent of the MHH and FHHs. Gerjalle FTC is the least in terms of crop and livestock technology training out reaches with 9 and 2 percent in crop and 30 and 2.1 percent MHH and FHH in livestock related technology beneficiaries, respectively while Gerjele is ranked third in terms of NRM trainings with 14 and 4 percent FHH and MHH out reaches.

The role played by each FTC in technology dissemination

Fertilizer

During the 2009/2010 production season except Gerjalle three of the sampled FTCs have supplied fertilizer to their clients in collaboration with fertilizer supplier institutions. Of the

total supplied amount for the 4 FTC Selambikalsi covers 61 percent while Tao and Tumuga supplied 23 and 16 percent.

Commercial crop

Onion is one of the newly introduced commercial vegetable crops in Alamata. From the total formally disseminated onion seed during the 2009/2010 production season S/bikalsi received 40 percent followed by Tumuga, Gerjelle and Tao. This is one of the indications for departing and success of the FTC from others in shifting in cropping system from food crops to market oriented commodities.

Table 27. FTCs in technology dissemination

Technology dissemination	Percentage share of the FTC in technology dissemination			
	Gejalle	Tumuga	S/bikalsi	Tao
Fertilizer	-	23	61	16
Onion seed	13	38	40	9
Cereal(Maize and sorghum)	51	22	18	9

Sources: AWARD, 2009

Staple food crop technology adoption

In the 2009/2010 production season improved seeds of these commodities were supplied to each FTC. Out of the total supplied seeds of these crops 51 percent of them were disseminated in Gerjalle followed by Tumuga, S/bikalsi and Toa. Diffusion/ dissemination of consumption crops could be also an indication for weakness of introducing and influencing the farming community in commercial orientation which is also witnessed in the relatively poorly deviating FTCs like Tumuga and Gerjalle.

5. SUMMARY, CONCLUSION AND RECOMENDATIONS

5.1. Summary

The critical challenge confront most developing countries including Ethiopia is improving the life situation of rural community at least in securing them with basic needs. The prevalence of poverty and its severity made millions of people out of the basic needs of survival. Among the reasons for the rural households to live in poverty is lack of knowledge and skill on improved farming and poor utilization of new technologies, and thereby lack of improvement in agricultural production and productivity. To alleviate this problem, educating farmers through basic education intervention and farmers training on improved agricultural and living practices is paramount important. Among others, the establishing of FTCs in every peasant associations in Tigray region in particular and Ethiopia in general is an emerging agricultural extension strategy aiming at developing human capital through training to enhance farmers' knowledge, practical skills, aspiration and practice change for improving production and productivity and rural livelihoods.

Sometime has elapsed since FTCs have been made functional in Alamata Woreda to facilitate human resource development and agricultural transformation. However, systematic assessment including from the farmers' viewpoint of the relevance and the effectiveness of the various aspects of trainings has not been done yet. Thus, addressing these knowledge gap is paramount important. Hence, this study was aimed at analyzing the relevance and effectiveness of FTC-based training in knowledge, aspiration and practice change. In addition, the study has made an attempt to explore whether there is (are) positively deviating FTC(s) among the studied four FTCs. The latter was done to identify any successful practices for scaling out.

The study was conducted in four purposefully selected PAs of Alamata Woreda; and the household survey covered 130 randomly selected farmers, 65 trained and 65 untrained. In addition, 14 DAs and 20 woreda experts were also consulted during the data collection

process specifically to identify and characterized positive deviance FTCs. Semi-structured interview schedule was used for collecting the essential quantitative data from the sampled trained and untrained respondents. Qualitative data was collected through observation, focus group discussions, expert and DAs interviews. The quantitative data was analyzed by using descriptive and inferential statistics such as cross tabulation, frequency, percentage, chi-square and t-test. The qualitative data was analyzed through interpretation, triangulation, description and appreciation of facts. Moreover, a Likert- type response format were used to rate positive deviance FTC, the anchors for this scale were disagree, and agree with the middle point on the scale being neutral.

Based on the result of this study, FTC based training is found relevant in terms of timeliness, schedule and venue of training, the overall knowledge, practical farming skills of the trainers and communication skill of the resource person. However, in the entire sample FTCs well organized and planned training needs assessment was not conducted. This signifies that the trainings made so far were mostly not need based. Besides the study also revealed that, all the FTCs used class room lecture, visiting demonstration fields, group discussion, field practices and visiting model/exemplary farmers' field training methodologies at varying degree, although all the FTCs seem to give more emphasis to classroom lecture. However, field practice and practical demonstration were the two most important and appropriate for effective training on a specific agricultural production technology. Mostly the training delivered was theoretical, being lecture one of the most commonly used methods. Follow-up and regular evaluation of trainings did not exist and measurements of participant's reactions and outcomes of trainings have not been undertaken systematically.

With respect to the effectiveness of the training, the knowledge, aspiration and practice change brought through training were also assessed. The study shows that there is significance change in knowledge, aspiration and practice of trained and untrained farmers. Trained farmers knowledge, aspiration and practice were found to be higher than the untrained farmers had acquired. It was observed that the significant numbers of untrained farmers' knowledge, aspiration and practice level on extension packages were categorized in the low range for all of the FTCs.

From the 4 sample FTCs Slembikalsi is found to be positively deviating FTCs. Based on departure from the norms, intentional behaviors, and honorable outcomes such as technology dissemination, exemplary demonstration field management, diversified and substantial training outreaches with relatively balanced gender equality as indicators of positively deviating successful FTCs of S/bikalsi. In addition, Tao, although established relatively late and got less support, also represents a substantial departure from the remaining FTCs next to Slembikalsi. In this research context, positively deviant FTC is the one that performed better than the other FTCs regardless of similar problems and resource base. In fact, the result is a function different stakeholder, among others the role played by IPMS and wereda offices of agriculture were pivotal.

5.2. Conclusion and Recommendations

The study has revealed that FTC based farmers training is relevant in most of the training components except that of TNA, practical orientation, in inclusion of ITK, follow up\ regular evaluation of trainings and gender considerations. However, FTC based training is effective in changing the level of knowledge, aspiration and practice of the farmers have on different farm commodities. Based on composite indicators of positive deviance like intentional behavior, departure from the norm etc., two successful FTCs were also found for scale out. Based on the results of this finding the following recommendations have been forwarded so as to improve the relevance and effectiveness of FTC based trainings.

- As agriculture is the base for this country, thus way to enhance productivity through promoting of training or extension education throughout the region in general and the study area in particular need to take into account. To implement this development policy and program intervention should be designed at the grass root levels.

- In this study we observe training need assessment is a lacking element. Hence, emphasis should be placed on making decisions and setting priorities based on information gathered from the people likely to be affected by these training programs.
- Most of the training was highly theoretical and lecture type of methodology hence, redirecting in mixing both theory and practice with the help of audio visual aids and different demonstration methods should be future assignment as most of the farmers of our country are illiterates.
- The results of this study indicate the existences of disparities among FTCs in facilities which may influence the relevance and effectiveness of training. Hence, there is a need to make concerted effort to capacitate the FTCs. Towards this end, policy makers should allocate sufficient resources to FTCs for extension education, if need be thought generate from NGOs.
- One of the issues raised by trained farmers and DAs was lack of reference manual and training materials in the FTCs. Hence, training to be relevant as much as possible written manuals and training materials should be available in the FTCs and for trainees after the training so to sustain the trained knowledge. In addition, uses of locally available materials, such as specimen of weeds, plant diseases, samples of fertilizers etc. should be encouraged based on the learning objectives, availability, conditions of the audiences and skills of users.
- In this study female farmers' participation is found poor. Hence, alternatives training programs should be arranged to encourage females' participation equally with their counter parts so as to improvement productivity and to solve various farming problems of females.
- This study also disclosed absences of monitoring and evaluation mechanisms. Hence, developing joint follow-up and regular evaluation activity at all levels of training and FTCs, through participation of all concerned stakeholders to make the roles of FTCs

more effective, to sustain their knowledge and improve practice as a whole is paramount important.

- We find also there is gap between FTCs in linkage and networks. Therefore, the linkage of FTCs should be strengthen with different stakeholders for improving the status and potential of FTCs and enhancing the capability of the DAs as well as farmers at least through experience sharing from within and at most through creating suitable network with different institutions to each FTC.
- We find also lack of budget in the daily routine activities of all FTCs. Hence, to solve the financial constraint, the woreda in collaboration with different stakeholders and respective kebeles have to allocate budget and they have to search other income options. For example, revenue generation schemes within the FTC compounds which can be used at least for training.
- Training outreach varies among FTCs which is the results of both endogenous and exogenous factors of the FTCs. Therefore, there should be immediate attention in assessing these governing factors and resolving the shortfalls and creating alternative incentive/reward systems for successful DAs and FTCs
- This study also revealed that positive deviance FTCs are relatively better in disseminating commercial oriented commodities. Hence, there should be experience sharing mechanisms among FTCs so as to cross fertilize the successful results throughout the study area.
- Finally the author recommend that, to improve the relevance and effectiveness of farmers training at FTCs in different aspects and to generate more information in order to enhance the knowledge and capability of farmers which can serve as an experience for others further studies has to be conducted at regional and national level.

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7. APPENDICES

Appendix Table 1. Conversion factors used to calculate Tropical Livestock Units (TLU)

Animals	TLU-equivalent
Calf	0.25
Heifer & Bull	0.75
Cows & Oxen	1.00
Horse	1.10
Donkey	0.70
Ship & Goat	0.13
Chicken/poultry	0.013

Source: Strock *et al.*, (1991)

Appendix Table 2. Farmers' response on skill orientation of training Alamata Woreda 2010(N= 65)

S/N	Areas of training	Training skill orientation (%)		
		Very theoretical	Very theoretical	Very theoretical
	Natural resource management	47.95	36.13	15.95
1	Soil water conservation practices	27.8	48.1	24.1
2	Forest protection and management	65.2	26.1	8.7
3	Nursery management practices	57.1	28.6	14.3
4	Use of improved stove	41.7	41.7	16.7
	Crop technology	61.53	27.25	11.23
1	Compost preparation	66.7	16.7	16.7
2	Back yard manure preparation	47.6	40.5	11.9
3	Use of improved seed	75.7	16.2	8.1
4	Use of inorganic fertilizer application	64.3	32.1	3.6
5	Weed and pest management practices	63.3	30	6.7
6	Tillage practices	64	32	4
7	Fruit husbandry	51.5	33.3	15.2
8	Row plating	57.7	23.1	19.2
9	Irrigation water management practice	60.9	30.4	8.7
10	Crop calendar	63.6	18.2	18.2
	Livestock technology	66.86	20.83	12.27
1	Forage husbandry	55.6	27.8	16.7
2	Cattle fattening	60.7	17.9	21.4
3	Sheep and goat fattening	60.9	30.4	8.3
4	Animal housing	64.3	35.7	-
5	Dairy production	63.6	27.3	9.1
6	Poultry production	80.8	11.5	7.7
7	Beef production	75	8.3	16.7
8	Modern Beehive	73.3	20	6.7
9	Cut and carry/ zero grazing	67.7	16.1	16.1
10	AI service	66.7	13.3	20
	Other social issues	67.97	21	10
1	Use of credit	73.9	13	13
2	Family planning	63.3	23.3	13.3

Source: survey result, 2010

Appendix 4. Interview schedule

General Instruction for the interviewer

Please make sure that the interviewee has fully understood the objectives of the interview and the information s/he gives will be confidential.

It is absolutely necessary to win the confidence of the interviewee by creating climate of friendship and trust and asking her/him convenient time and place to get reliable information.

Please skip questions you feel sensitive or the interviewee is reluctant to answer at the beginning of the survey.

Don't make any promise of help and use local unit and expression while interviewing farmers.

Write any additional information you get from interviewees in your notebook and/ or at bottom of the pages of the questionnaire in the language you are comfortable with (Tigray, Amharic or English).

Serial No. of the interview schedule _____

Name of the kebele (tabia) _____

Name of the village _____

Name of the FTC _____

Interviewee name _____

Date of interview _____

Interviewer name _____

A. HOUSEHOLD CHARACTERISTICS

1. Household demography

Age group	Number	Education@	Currently going to school Yes/No	Health status Ok/sick*
Adult male (17 – 50 years old)				
Adult female (17 – 50 years old)				
Female greater than 50 years old				
Male greater than 50 years old				
Young male (14 – 16)				
Young female (14 - 16)				
Children less 14 years				

Legend- Education level: 0 = Can not read and write 1 = Able to read and write, but no formal Schooling

2 = Primary school 3 = Secondary school

2. CHARACTERISTICS OF THE RESPONDENT

No.	Attributes	
1	Age	
2	Sex	
3	Religion	
4	Marital status	
5	Education level (codes the same as above)	
6	Experience in farming_____ (year)?	
7	How long s/he participated in crop extension	
8	How long s/he participated in livestock extension	
9	How long s/he participated in other household package other than crop and livestock such as adult education, health & nutrition, non-farm, etc (specify)	
10	Have you ever been a model farmer? Yes\No	

Legend: Sex- 1=male Religion 1= Christian Marital status 1= single 3= widow

2= Female 2= Islam 2= married 4= divorce

Educational level 0= Can not read and write 2= Primary school

1= Able to read and write 3= Secondary school

B. Farm Household resource endowment

3. FARM RESOURCES

3.1. Did you face shortage of labor in the past 12 months (✓)? Yes No

3.2. Do you use hired labor in the past 12 months (✓)? Yes No

3.3. If your answer is yes, the number of labor hired used -----?

3.4. Livestock ownership

Category	Number owned (heads) current
Cows	
Heifer	
Oxen	
Bulls	
Calves	
Camel	
Donkey	
Sheep	
Goats	
Hives (local)	
Hives (improved)	
Chicken	

3.5. Did you face shortage of oxen during this crop season? Yes/no _____

3.6. If yes, how did you overcome it? 1. By rent 2. By begging 3. By digging 4. Shared in

4. Farm implement and household items

4.1. Farm implements

Implement /equipment	Yes(✓)	No(✓)	Number
Akafa (spade)			
Dongora (hoe)			
Gorbotta (saddle for donkey transportation)			
Maresha (yoke & plough)			
Machid (Sickle)			
Kotto (axe)			
Pump			
Latrine			
Other (specify)			

5. House type and household items

5.1. House type

Type	Yes(√)	No(√)	Number	Value
Thatched house				
Tine- roofed house without partitions				
Tine- roofed house with partition				
Other (specify)				

5.2. Purchased household items

Items	Yes(√)	No(√)	Number	Value
TV				
Transistor radio				
DVD/VCD player				
Tape recorder				
Bicycle				
Any mat				
Lantern thermos flask lump				
Other (specify)				

6. Access to land and land use

6.1. How much is the current total holding size in timad?

6.2. How did the household acquire the land?

1. Land distribution 2. Inheritance 3. Gift 4. Rented in 5. Shared in

7. Participation and position in rural institutions/organizations

Organization name	Member?		Leader/management member?	
	Yes(√)	No(√)	Yes(√)	No(√)
Development group				
Tabia Food security task force				
Model farmer				
FRG				
Cooperative				
Women affairs				
youth association				
Member of political Party				
Other (specify)				

C. LIVELIHOOD OPTION AND CHOICES

8. Get the lists of the main livelihood options for the household including cereal, vegetables, fruits, livestock- dairy, cattle fattening, sheep/goats, beekeeping, poultry, off/non-farm, etc with most important option in the last 12 months.

Options	Yields trend	Participation trend	Contributing factors		Price trend	Income trend	Contributing factors		Rank	Total Yield	Responsibility				
			Yields	Participation			Price	income			Production	post-harvest	marketing	Control over income	Make spending decisions
Crop															
Livestock															
Off\Non farm															

Legend- Yield trend: rate on scale 1 (declined substantially) to 5 (increased substantially) tendency **Participation trend:** rate on scale 1 (declined substantially) to 5 (increased substantially) tendency **Price trend:** rate on scale 1 (declined substantially) to 5 (increased substantially) tendency **Income trend:** rate on scale 1 (declined substantially) to 5 (increased substantially) tendency

Rank: in order of relative importance to household from 1 (most important), 2(second most important), etc.

Responsibility: 1= mainly husband 2= mainly wife 3= both 4= son 5= daughter

Crop option: 1. Cereals 1.1. Maize 1.2. Sorghum 1.3. Teff 1.4. Wheat 1.5. Barley **2. Vegetables** 2.1. Onion 2.2. Tomato 2.3. Potato 2.4. Cabbage 2.5. Carrot

Livestock option: 1. Cattle fattening 2. Shoat fattening 3. Dairy 4. Poultry 5. Beekeeping

Off\ Non-farm Option: 1. Trading 2. Beverage 2.1. Swa 2.2 Tej 2.3 Caticala 3. Guard 4. Builder 5. Daily labour 6. Crafts men 6.1 Pottery 6.2. Wood and metal work 6.3. Weaving

Legend- Contribution factor	Contribution factor for declined substantially	Contribution factor for increased substantially
Yield	1. Shortage of rainfall 2. Flood 3. Diseases and pest 4. Lack of Knowledge on inputs 5. Traditional farming system 6. Inappropriate handling product 7. No access to inputs/technology	1. Proper use of input 2. Access to input 3. Enough rain full 4. Enough Awareness
Participation	1. High population 2. Lack of employment 3. Less advantage 4. Lack of money 5. Lack of market 6. Lack of infrastructure	1. Availability of infrastructure 2. Availability of work 3. Availability of market 4. Availability of enough money
Price	1. Shortage of market information 2. Distance 3. Lack of Production quality 4. Lack of infrastructure 5. Lack of credit service	1. Access of market information 2. Production quality 3. Availability of infrastructure 4. Access to credit service
Income	1. Shortage of money 2. Shortage of materials 3. Shortage of market information 4. Inappropriate handling product 5. High interest rate 6. Shortage of rainfall	1. Enough money 2. Access of market information 3. Access to input 4. Enough materials 5. Enough rain full 6. Proper use of input

9. ASPIRATION AND, PERCEPTION OF CONSTRAINTS AND SOLUTIONS

Options	Your important goal \aspiration	How you intend to achieve	Constraints to achieve the goal	Have you try to overcome Yes\No How?
Crop				
Livestock				
Off\non-farm				

Legend- 1.goal on Crop &livestock: 1. For selling 2. Human food 3.For seed 4.Animal feed 5. For breeding 6. Plough 7. Draft power

Goal for Off\non farm: 1. Create livelihood options 2. Agricultural income is not sufficient 3. Occurrence of Rapidly drought

2. Crop achievement: 1. Using inputs 2. Soil water conservation 3. Land expansion 4. Management practice

Livestock Animal breeding achievement: 1. Animal breeding 2. Increase the quality and quantity of animal 3. Use different animal feed

Off\non farm achievement: 1. Daily labour 2. petty\different trade

3. Constraints: 1. Shortage of money 2. Lack of credit service 3. Shortage of rainfall 4. Flood 5. Disease and pests 6. Shortage of awareness on inputs

4. Overcome on crop option: 1. Land expansion 2. On time sowing 3. Properly use of inputs 4. Water harvest practice

Overcome on livestock option: 1. Breeding 2. use different animal feed 3. Proper feeding

10. Access to credit

Items	Yes(√)	No(√)	Who access		Amount		Purpose/ reason
			Male	Female	Male	Female	
Do you need loan for your agricultural activities?							
Do you need loan for activities other than agriculture (off/non-farm)							
Did you borrow from formal source in last 12 months?							
Other (specify)							

Legend- Purpose/reason: 1. To bought improved seed 4. To educate my children 7. To payment (daily labour)
 2. To bought farm equipment. 5. To bought medicine 8. To rent house 10. To bought animal
 3. To bought fertilizer (pest\insect side) 6. To return packages 9. To bought materials

11. Access to inputs and supportive services for priority livelihood options

Access to inputs and services for priority crop option livestock option and Off/non-farm	Access		Source(in the order of importance)	Accessibility and utilization Constraints
	Yes (√)	No (√)		
crop option				
Access to improved seed			1 2	
Access to inorganic fertilizers			1 2	
Access to irrigation moisture conservation(rainwater harvesting technology)			1 2 3	
Access to inputs and/or protection service(anti weed, herb side and insect side)			1 2 3	
Livestock option				
Access to improved breeds or breeding service			1 2 3	
Access to improved feeds (Forage, grass			1 2	
Access to inputs and/or protection service(veterinary service)			1 2	
Access to preservation and processing technology			1 2	

Access to inputs and services for priority crop option livestock option and Off/non-farm	Access		Source(in the order of importance)	Accessibility and utilization Constraints
	Yes (√)	No (√)		
Off/non-farm option				
Access to inputs/technology			1 2	

Legend- Sources: 1. Woreda bureau of agriculture 3. Union 5. WV 7. Farmer 9. Private sectors
2. Cooperatives 4. IPMS 6. REST 8. Research center

Constraints: 1. Shortage of money 3. Lack of credit service 5. Inappropriate payment 7. Bureaucracy
2. Price expensive 4. High interest rate 6. Shortage of rainfall 8. Bureaucracy 9. Untimely access of input

12. Access to extension advisory service

1. What are your main sources (in the order of importance) of knowledge & information for your priority livelihood options?

Knowledge domain	Access		Option 1	Option 2	Option 3
	Yes	No			
Knowledge & information on improve production input/technology in crop, livestock, and off/non-farm technology			1. 2. 3.	1. 2. 3.	1. 2. 3.
Knowledge & information on crop protection /animal health			1. 2.	1. 2.	1. 2.
Knowledge & information on products (farm/non-farm) handling & processing			1. 2.	1. 2.	1. 2.
Knowledge & information on product market (quantity and quality demanded, price trend, market outlet, etc)?			1. 2. 3.	1. 2. 3.	1. 2. 3.
Knowledge & information on specific policies such as access to land, water and grazing area; animal health regulation, cooperative law, etc			1. 2. 3.	1. 2. 3.	1. 2. 3.
Other specify			1. 2.	1. 2.	1. 2.

Legend- Sources: 1. Radio 2. TV 3. Magazine\Newspaper 4. Model farmers 5. Training 6. Experience sharing 7. Private input suppliers 8. Tabia /community meeting 9. Pamphlet 10. DAs

13. Participation in other extension activities in the past 12 months

Learning events	Participation		Who took part	Please specify the subject	Practical usefulness
	Yes	No			
Managing demonstration/on-farm trial					
Farmer field day					
Experience sharing visit					
Farmer-to-farmer knowledge sharing					
Discussion with model farmer					
FRG /FFS					
Other (specify)					

Legend- Who took part: 1= husband 2= wife 3= both 4= son 5= daughter **Practical usefulness:** 1. not useful 2. Useful 3. Highly useful

14. Frequency of contact with DAs during last cropping season: 0. no contact 1. Once in a season 2. Quarterly 3. Every other month 4. Fortnightly 5. At least once in a week? _____

15. Which other means do you use for accessing knowledge and information?

Possible means	Yes(√)	No(√)	Importance@
TV/Radio			
Training (non-modular)			
Training (modular)			
Tabia /community meeting			
Private input suppliers			
Other (specify)			
News paper/fliers			
Local school			

Legend- Rate relevant sources@ from: 1. not useful 2. Useful 3. Highly useful

16. Knowledge gap assessment

No.	Description of knowledge gap	Knowledge gap target	Identification process
1			
2			
3			
4			
5			
6			
7			
8			
9			

17. In your view, what are the 3 main constraints in accessing knowledge/information and in accessing credit in your priority livelihood options?

Livelihood options	Constraints in accessing knowledge/information	Constraints in accessing finance/credit
Crop option	1	1
	2	2
Livestock option	1	1
	2	2
	3	3
Off\non-farm option	1	1
	2	2

Legend- **Constraints in accessing knowledge/information:** 1. Distance of residence from 2. Distance of residence from FTC Woreda

3. Lack of innovators **Constraints in accessing finance/credit:** 1. High interest rate 2. Bureaucracy 3. Inappropriate payment
4. Lack of credit Utilization 5. Lack of information 6. Belief\Religion 7. Lack of credit service

18. Assessment of farmers' Knowledge & perception of new technologies & practices

- 18.1. What is the rate of DAP for crops in hectare?
- 18.2. What is the rate Urea fertilizer for crops in hectare?
- 18.3. What are the artificial fertilizers?
- 18.4. What are the natural fertilizers?
- 18.5. What are the advantages of compost and manure over inorganic fertilizer?
- 18.6. What are the advantages of row planting over broadcasting method?
- 18.7. What are the advantages of anti weed over hand weeding?
- 18.8. Mention the advantages of artificial insemination?
- 18.9. What are the advantages of animal vaccination?
- 18.10. Mention the advantages of modern beehive over local one?
- 18.11. What are the things used for fattening?
- 18.12. Mention the causes of soil degradation?
- 18.13. What is soil conservation structures used for controlling soil degradation?
- 18.14. Mention the consequence of natural resource degradation?
- 18.15. Mention the advantages of family planning?
- 18.16. What are the contraceptive methods?
- 18.17. What are methods used to HIV prevention?
- 18.18. How confident are you in practically applying the technology effectively or teaching other farmers how to effectively apply it? 1. Very low 2. Low 3. Medium 4. Good 5. very good

For trained farmers

I. ACCESS TO AND, PERCEPTION ABOUT THE RELEVANCE AND EFFECTIVENESS OF FARMR TRAINING

1. Have you attended modular training at FTC?

		Reasons
1.1	No, neither ever attended modular training (please provide detailed reasons)	1. 2. 3.
1.2	Do you wish to attend modular training in the future (yes/no)?	1. 2. 3.
1.3	Yes, I started and discontinued	1. 2.
1.4	Yes, I attended & successfully completed the training	1. 2.

1. Have you ever attended non-modular short training at FTC?

		Motivating/inhibiting factors
1.1	No, neither ever attended non-modular short training at FTC	1. 2. 3.
1.2	Do you wish to attend non-modular training in the future?	1. 2. 3.
1.3	Yes, I started and discontinued.	1. 2. 3.
1.4	Yes, I attended & completed the training	1. 2.

Legend- Reason

1.1: 1. Labor shortage 2. Selection bias 3. Gender sensitive 4. Lack of awareness 5. No modular training at all 6. Distance of residence from place of training

1.2: 1. To get Knowledge 2. To enhance our productivity 3. To change our environment 4. To change Attitude

1.3: 1. Labor shortage 2. Not need based 3. For so long time 4. In appropriate timeliness 5. Distance of residence from place of training

1.4: 1 Interest\ need based 2. Relevant and convenient 3. Effective in knowledge 4. Attitudinal change 5.Appropriate schedule

II. FTC Training content and mode of delivery

1. If you have ever attended training at FTC in the past 12 months, please take the most recent experience and provide the details and also application and effect of new technologies & practices learnt by the farmer (provide your feedback on modular\ non modular training if you have attended both)

Training course	Duration of the training	Venue (if not at FTC)	Skill- orientation	Do you have capability on...		Technology or practices you have applied Practice		Level of satisfaction with performance
				Yes	No	Yes	No	
Compost preparation								
Manure preparation								
Use of improved seed								
Use of inorganic fertilizer application								
Weed and pest management practice								
Tillage practices								
Fruit husbandry								
Row planting								
Crop calendar								
Irrigation water management practice								
Forage husbandry								
Cattle fattening								
Sheep and goat fattening								
Animal housing								
Dairy Production								
Poultry production								
Beef production								
Modern beehive								
Zero grazing								

Training course	Duration of the training	Venue (if not at FTC)	Skill- orientation	Do you have capability on...		Technology or practices you have applied Practice		Level of satisfaction with performance
				Yes	No	Yes	No	
AI service								
Soil water conservation								
Forest protection and management								
Nursery								
Improved stove								
Market oriented production								
Credit service								
Family planning								

Legend- Scale for skill orientation: 1. Highly theoretical 2. Highly practical 3. Both

Level of satisfaction with performance: 1. Very disappointed 2. Disappointed 3. Medium 4. Satisfied 5. Very satisfied

1.1. Before participating on the training you took, were you consulted about your need for training?

1.1.1. If yes, how was the need assessment made?

1. By asking your interest
2. By discussing on the practices followed by you and identifying gap
3. By discussing on the problems related to agricultural activities
4. By asking the knowledge you have on the topic of the training

1.2. Do you think the training you obtained was relevant and in line with your need?

1. Yes 1. No

1.3. Who was selecting the farmer trainees?

1. Woreda bureau of agriculture
2. DAs
3. PA leaders\local administration
4. Woreda cabinet
5. Other (specify): _____

1.4. What are the criteria for trainees' selection?

1. Friendship based
2. Blood relation based
3. Biased towards educated farmer
4. Model farmer focused
5. Political tie focused
6. Rich farmers

1.5. What were the methodologies used during your training?

1. Class room lecture
2. Visiting demonstration fields (result and method demonstration)
3. Group discussion
4. Field practices
5. Visiting model farmers
6. Other (specify): _____

1.6. Which method do you think is more appropriate to teach farmers?

1. Class room lecture
2. Visiting demonstration fields (result and method demonstration)
3. Group discussion
4. Field practices
5. Visiting model farmers
6. Other (specify): _____

1.7. Who was developed the training schedule?

1. Woreda bureau of agriculture
2. DAs
3. PA leaders\local administration
4. Woreda cabinet
5. Other (specify): _____

1.8. Who else, other than the DAs at FTC, involved during the training as resource persons (practical session, sharing knowledge and/or personal experience)

1. Regional bureau of agriculture
2. Woreda experts
3. PA leaders\local administration
4. Woreda cabinet
5. Other (specify): _____

19. Have the trainings been effective in producing the desired outcomes and impacts up on you\ on your neighbors?

1. Yes 2. No

If the training was effective in producing the desired outcomes and impacts please provide the effects

1. Behavioral change such as increased knowledge seeking behavior
2. Communication improvement such as farmer-to-farmer knowledge flows, two way flow of knowledge and information between farmers and DAs
3. New practice learnt and adopted such as technology assessment skills, technology adaptation and use or rejection on the basis of rational decision
4. Increased collective action on voluntary basis for natural resource management,
5. Loss reduction,
6. Quality improvement
7. Ecological benefits such as improved soil and water management, improved management of communal property regimes
8. Economic benefit such as improved income and saving
9. Social benefit such improved gender relations

2. Farmer assessment of the relevance and appropriateness of FTC-based training.

No.	Relevance of training activities/process	Very good	Good	Fair	Poor
1	Timeliness of training				
2	Relevance of the new technologies				
3	Practices to your pressing problems and needs				
4	The extent to which the learning experience reflected and rooted in the local context (ITK) indigenous				
5	Suitability of the timing of the training				
6	Suitability of the schedule of the training				
7	Suitability of the venue and the place where sessions were conducted				
8	Adequacy and quality of training facilities, particularly for practical sessions				
9	Knowledge of the trainers (DAs)				
10	Practical farming skills of the trainers (DAs)				
11	Communication skill of the resource person				
12	In knowledge change				
13	Follow up after the training				
14	Your overall level of satisfaction with the relevance of the training				
15	Suitability of the timing of the training for both male and female				
16	Suitability of the schedule of the training for both male and female				

III. Exploration of positive deviance

1. Experts levels of agreement on the analysis of Positive deviance FTC

S/ No	Items used to measure Positive Deviance	FTC(√)				
			Gerjalle	Tumuga	S/Bikalsi	Tao
	Departure From Norms					
1	The behaviors/ outputs described in the FTC (training, technology dissemination loan repayment etc)significantly departed from other FTCs	Disagree				
		Neutral				
		Agree				
2	The FTC out smarts/acted in a way that was not expected	Disagree				
		Neutral				
		Agree				
3	The actions of the FTC did not represent "business as usual."	Disagree				
		Neutral				
		Agree				
	Intention					
1	The behaviors/outputs described in the FTC (training, technology dissemination etc) were intentional rather than happening by chance.	Disagree				
		Neutral				
		Agree				
2	What occurred happened in the FTC (training, technology dissemination, loan repayment etc) by accident	Disagree				
		Neutral				
		Agree				
3	The DAs, administrators and stakeholders in the FTC acted voluntarily rather than being coerced by others.	Disagree				
		Neutral				
		Agree				
4	The actions of the FTC were discretionary/open/unlimited.	Disagree				
		Neutral				
		Agree				
	Honorable Nature					
1	The outputs described in the FTC (training, technology dissemination, disbursement etc)/ in the episode/FTC were honorable.	Disagree				
		Neutral				
		Agree				
2	The actions of the FTC could be characterized as virtuous.	Disagree				
		Neutral				
		Agree				
3	The FTC outputs described in the FTC (training, technology dissemination, loan repayment etc) / episode could be described as ennobling.	Disagree				
		Neutral				
		Agree				
4	The FTC performance is honorable	Disagree				
		Neutral				
		Agree				

For DAs

2. In your opinion, which organizations are important sources of information/knowledge and/or technology for your FTC, and are your linkages with these organizations formal or informal?

Organization	Linkage (formal/informal)	Importance@ as source of k/I	Importance@ as source of technology
Ethiopian Institute of Agricultural Research			
Alamata Agri.reseach Center			
Public extension services (Federal)			
Public extension services (Regional)			
Public extension service (Zonal)			
Mekelle university			
Foreign technical assistance (projects)			
Maichew ATVETs			
Private firm (Solomon)			
IPMS			
World Vision			
DECSI			
TAMPA			
IFAD			
Farmers organizations or coop (specify)			

Rate on scale 1(some what important) to 3 (very important)