

**EFFECTIVENESS OF MODULAR TRAINING AT FARMERS' TRAINING
CENTERS: THE CASE OF MI'ESO WOREDA,
OROMIA REGION, ETHIOPIA**

M.Sc. Thesis

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April 2010

Haramaya University

**EFFECTIVENESS OF MODULAR TRAINING AT FARMERS' TRAINING
CENTERS: THE CASE OF MI'ESO WOREDA,
OROMIA REGION, ETHIOPIA**

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Extension, School of Graduate Studies
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MASTER OF SCIENCE IN RURAL DEVELOPMENT AND
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By

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**April 2010
Haramaya University**

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DEDICATION

I dedicated this Thesis work to my wife, Meseret Siyoum, and daughters, Eden and Mi'iraf Biruk, who have paid a lot of scarification to get me in the right track, with all their affection, love and dedication to bring me up to this point of success.

STATEMENT OF AUTHOR

First, I declare that this thesis is my authentic work and that all sources of materials used for this thesis have been duly acknowledged. This thesis has been submitted in partial fulfillment of the requirements of M. Sc. degree at the Haramaya University and is deposited at the University Library to be made available to borrowers under rules of the Library. I solemnly declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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BIOGRAPHICAL SKETCH

The author, Biruk Tefera, was born on September 24, 1973 in Fitch town, North Shoa Zone of Oromia region. He attended his elementary and secondary education in Fitch town and joined Ambo College of Agriculture, now Ambo University, in 1992. He graduated in Diploma in General Agriculture in 1994. Soon after graduation, Biruk joined Oromia Bureau of Coffee and Tea Development in 1994, and served as Coffee Quality Control and Field Crops Production Expert in three woredas and zonal level department in west hararghe zone of Oromia region up to 2002.

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ACRONYMS AND ABBREVIATIONS

ADLI	Agricultural Development Led-Industrialization
ARDPS	Agriculture and Rural Development Policies and Strategies
CSA	Central Statistical Agency
DA	Development Agent
ECDI	Ethiopian Curriculum Development Institute
EID	Education and Information Division
FAO-UN	Food & Agriculture Organization of the United Nation
FG	Farmers Group
FGD	Focused Groups Discussion
FTC	Farmers' Training Center
HU	Haramaya University
IBCPM	Improved Beef Cattle Production and Management
IDCPM	Improved Dairy Cattle Production and Management
IFPRI	International Food Policy Research Institute
IPMS	Improving Productivity and Market Success
KII	Key Informants Interview
Km	Kilometre
MARC	Melkasa Agricultural Research Center
masl	Meters above sea level
mm	Millimeter
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture & Rural Development
MWARC	MelkaWorer Agricultural Research Center
NGO	Non-governmental Organization
NIOSH	National Institute for Occupational Safety and Health

ACRONYMS AND (Continued)

NRM	Natural Resources Management
OARI	Oromia Agricultural Research Institute
OBoARD	Oromia Bureau of Agriculture & Rural Development
OHP	Overhead projector
PA	Peasant Association
PBTE	Performance-Based Teacher Education
PDI	Positive Deviance Initiative
PLW	Pilot Learning Woreda
PRA	Participatory Rural Appraisal
PTD	Participatory Technology Development
RAAKS	Rapid Appraisal of Agricultural Knowledge Systems
REFAC	Research-Extension-Farmers Advisory Council
SHRM	Society for Human Resource Management
SMSs	Subject Matter Specialists
SPSS	Statistical Packages for Social Sciences
Std.	Standard deviation
SWC	Soil and Water Conservation
TIER	Training Intervention Effectiveness Research
TNA	Training Needs Assessment
TOT	Transfer of Technology

ACRONYMS AND (Continued)

TVET	Technical Vocational Education and Training
WoCP	Woreda office of Cooperatives Promotion
WoPRD	Woreda Office of Pastoral and Rural Development

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EFFECTIVENESS OF MODULAR TRAINING AT FARMERS' TRAINING CENTERS: THE CASE OF MI'ESO WOREDA, OROMIA REGION, ETHIOPIA

ABSTRACT

In order to bring a realistic transformation in Ethiopian agriculture, farmers need to improve their knowledge, skill and attitude & have access to information and technologies, markets etc. Currently, Farmers' Training Centres are designed to provide services of extension, trainings, demonstration, information, advice, etc at grassroots level. Modular training is one of the main functions of the centers. In the study area, modular training has been offered since 2007. However, evaluation was not made to determine effectiveness in terms of changes in farmers' knowledge, attitude and practice levels, & relevance to the needs and priorities of rural households to make improvements. On the other hand farmers seem to have been reluctant to participate in the modular training. There is poor communication between research, extension and farmers. Thus, this study focused on effectiveness of the modular training and exploration of institutional and organizational dimensions of Farmers' Training Centers. A multi-stage sampling strategy was used to select sample peasant associations. 140 sample households were selected randomly from four peasant associations. Semi-structured interview schedule and checklist were managed to collect both qualitative & quantitative data. Descriptive statistics and tests of significance (chi-square & t-test) were adopted for analysis of quantitative data. Thematic transcriptions, narrations and Rapid Appraisal of Agricultural Knowledge Systems (RAAKS) tools were used for qualitative data analysis. The findings revealed training needs assessment was not conducted in the study area before the training. However, the content of training topics was relevant, need-based & harmonious with the farming practices. The results also demonstrated that, the modular training offered has improved knowledge, attitude and practice levels to enhance performance. Significant differences were observed between mean scores of knowledge, attitude and practice tests of trained and untrained sample households. The technologies included in the trainings were market-oriented and have higher demand. Institutional support service, such as inputs supply, credit, product marketing and cooperatives are poorly functioning. Moreover, poor communication and weak linkages exist between relevant institutions presumed to work with Farmers' Training Centres at local level. Women participation was very low in the modular training. Adaptation and dissemination of improved technologies, fairs, video show, accessing market information for rural households & literacy programme are the positive deviances accomplished in the study area. These are uncommon strategies created by deviant FTCs and help provide better solutions for local challenges. It would contribute better if these positive remarks scaled-out to other similar contexts. In general, governmental & non-governmental organizations should give emphasis to support and strengthen Farmers' Training Centers to sustain effective implementation of the modular training programme.

1. INTRODUCTION

1.1. Background of the Study

To bring a realistic transformation of Ethiopian agriculture from the current subsistence to a market orientated production system, farmers need to improve their knowledge, skill and attitude and have access to information, technologies, markets, etc. To do so, of the many support services, agricultural extension plays a critical role, as it contributes to the development of the skill and knowledge of farmers to adopt new and improved technologies (Birhanu *et al.*, 2006). Extension service has meant different things to different people. The transfer of technology (TOT) model conceptualized agricultural extension as the mechanism for information and technology delivery to farmers (Moris, 1991).

Extension services in Ethiopia until about 2002 were focused on increasing production and productivity in view of achieving food security (Mathewos and Chandargi, 2003). The main focus of the extension system was transfer of technology (TOT). This model was non-participatory and top-down approach, and its supply driven nature has limited the identification of development alternatives that are based on the bio-physical and socio-economic realities of the various agro-ecological zones of the country (Birhanu *et al.*, 2006).

On the other hand, a closer look at the different extension approaches adopted revealed that, they have been planned and implemented without the participation of the people for whom they have been designed. Apart from being biased against the livestock sector in the pastoral and agro-pastoral areas, the approaches have captured only farmers located a few kilometers from both sides of all-weather roads (Belay, 2003). There had not been much effort made in terms of empowering the rural poor with an aim to promote development from within the rural community. Thus, a large number of smallholder farmers have been suffering from food insecurity for years.

After a critical review of past experiences and lessons learnt, the government of Ethiopia has formulated the Agricultural Development Led Industrialization (ADLI) strategy as overarching policy response to food security and agricultural productivity challenges (MoARD, 2007). Among the strategy's distinctive features include: commercialization of smallholder agriculture and tailoring interventions to address the specific needs of varied agro-ecological zones. The other key feature of this innovative policy measure is the deployment of extension workers to every rural PAs to facilitate sustained knowledge and skill transfer to smallholder farmers.

However, it is evident that, in a situation where many farmers are illiterate, acquiring competence in production, adding value, and marketing challenges has its own limitations. Recognizing this fact, the government's response includes increasing the number Development Agents (DAs) through providing extensive training in agriculture and through the establishment of Farmers Training Centers (FTCs) to transfer improved agricultural technologies and give adequate services at a closer reach (Ibid).

Accordingly, FTCs are designed as local-level focal points for farmers to receive regular extension services, modular training, information, demonstrations, advice, etc. Agricultural training and extension services will identify activities that will benefit both women and men. Farmers will have access to agricultural extension services and all activities will give due emphasis to gender integration and identify activities that will benefit both women and men. Hence, FTC-based extension service is expected to enhance participation and empowerment of farmers and communities, linkages between groups and institutions, innovative learning and communication processes (MoARD, 2007).

Training is the process of acquiring specific skills to solve a problem and perform a job better (Jucious, 1963). 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. FTCs are designed as local-level focal points for farmers to receive regular extension services, modular training, information, demonstrations, advice, etc.

Modular training is one of the main functions of FTCs. It is a curriculum-based training program provided for farmers at FTCs to help them acquire knowledge and skills of specific agricultural production methods which is warranted by “The Green Certificate” (OBoARD, 2008). The training is offered both in classroom and demonstration fields in a well equipped fashion for a duration of 300 hours or six months. Development agents at FTCs are also trainers of the modular training programme.

The main distinction between the previous approaches of farmer training and the current modular-based one is that, former trainings base the traditional or academic approach, where the training staff designs the objectives, contents, teaching techniques, and evaluation, while, the modular training follows experiential approach. Experiential training emphasizes real or simulated situations in which the trainees will eventually operate, and the objectives and other elements of training are jointly determined by the trainers and trainees (Rama *et al.*, 1993). In this participatory approach, options are designed for flexibility during implementation for local adaptation and feed back. This mechanism helps enhance relevance and effectiveness of the training programme.

Effectiveness refers to a measure of the extent to which a training activity achieves its objectives, whether the intended changes in knowledge, skills and attitudes happened, where as, relevance is concerned with the degree to which the rationale, objectives, and expected impact of a training activity are, or remain pertinent, valid and significant with regard to long-range objectives or identified priority needs and concerns (FAO, 1991). Kirkpatrick, 2006 suggests much thought and emphasis need to be given in designing trainings to make sure that the programmes are effective and relevant. Evaluating training programmes helps determine the effectiveness and relevance of programmes to make improvements for future plans. The most common reason for this is that, evaluation can tell us how to improve future programs. The second reason is to determine whether a program should be continued or dropped.

Raab *et al.*, (1987), define training evaluation as "a systematic process of collecting information for and about a training activity which can then be used for guiding decision making and for assessing the relevance and effectiveness of various training components." This will lead to make improvements during designing future training efforts.

1.2. Statement of the Problem

Agriculture in Mi'eso woreda is first and foremost a way life and means of survival to the rural households. It involves dynamic social, cultural, historic, technical, and biological complexities within which the development process must function (Adugna *et al.*, 1996). Rainfall is highly variable and recurrent drought is the major challenge faced by pastoralists and agro-pastoralists in the woreda year after year and the adoption of innovative technologies of both crops and livestock is very low (WoPRD, 2009).

Obviously, the environment in which majority of small-scale farmers live is often dominated by uncertain weather conditions such as, recurrent drought, pests, diseases and price fluctuations. Farming in this environment is fraught with risks. Given the choices learnt in farmers' training system built on adult learning principles, farmers' can avoid as much risks as they can, if they are provided with the support and opportunities to exploit diversities existing in their area. Through a sensitive choice of training methods and presentation of innovations that are appropriate to the scale and type of farming being practiced, it is possible to help farmers reduce risks (Swanson *et al.*, 1990).

The rural development strategy clearly indicated interventions to be made in regions of pastoral and agro-pastoral areas; special efforts are made to enhance specialization in livestock production and marketing. Major interventions also include improving livestock quality, expansion of animal health services, water points, feed production and improvement of breeds and development of market infrastructure. Thus, the current FTC-based extension services provided in these areas should address the needs of rural households (MoARD, 2007).

Mi'eso woreda is one of the Pastoral and Agro-pastoral woredas of West Harerghe Zone of Oromia region. In the woreda, in the past few years, efforts were exerted by the government and non-governmental organizations to implement the innovative policy instrument. One of the efforts was building FTCs and equip with basic materials to offer modular training and thus, eight FTCs were constructed in eight agro-pastoralist PAs to date. Of these, five FTCs were equipped with furniture and materials, and have been offering modular training since 2007.

The trainings were given in three broad areas of Animal Sciences, Plant Sciences and Natural Resources Management. However, the modular training offered in the study area in the past three years was not evaluated to determine relevance to needs and priorities of farmers and effectiveness in terms of changes in farmers' knowledge, attitude and practice levels for enhancing performance. Training course modules and curricula guidelines were sent to FTCs from regional bureau of agriculture and rural development (WoPRD, 2009). Thus, it was not known how the designing and development processes of training were carried out.

At present, farmers seem to have been reluctant to take part in the training. In effect, the training has not been progressed as has been anticipated at the outset, for instance, only 12.6% was achieved out of targeted number of households for three years (WoPRD, 2009). Adoption of improved technologies is very low. There is poor communication between farmers, extension and research agencies, and other institutional support services. Thus, this study attempted to focus on relevance and effectiveness of modular training in terms of improvements in farmers' knowledge, attitude and practice levels and explore the current state of institutional linkages and organizational aspects of FTCs in order to fill the existing knowledge gap.

1.3. Research Questions

- How relevant is the design and implementation of the modular training?
- To what extent has the modular training effective in terms of improving the level of farmers' knowledge, attitude and practices?

- What are the institutional, organizational management and linkage mechanisms under which FTCs are functioning in the woreda?
- Why some FTCs are effective & others are ineffective regardless of similarity of the condition in which they operate?

1.4. Objectives of the Study

1.4.1. General objective

The general objective of the study was to analyze the relevance of modular training to the needs and priorities, and effectiveness in terms of changes in farmers' knowledge, attitude and practice levels, and explore institutional linkages and organizational aspects of FTCs.

1.4.2. Specific objectives

The specific objectives of the study were:

- to analyze the relevance of the contents to local priorities and needs:
- to see the effectiveness of modular training in improving farmers' knowledge, attitude and practices;
- to explore institutional, organizational management and linkage mechanisms under which FTCs are functioning to facilitate the application of knowledge acquired and skills gained; and
- to identify the positive deviances in the functioning of FTCs in the woreda.

1.5. Scope and Limitations of the Study

This study has attempted to explore the institutional, organizational management and linkages mechanisms with which FTCs are functioning in their current circumstances, and to see the major contributions of modular training in terms of changing the level of farmers' knowledge, attitudes and practice to enhance performance. In the course of the study, systematic processes of the modular training offered at FTCs were assessed in the light of the principles of adult learning. As this study has been conducted in specific agro-pastoral areas of Mi'eso woreda of West Hararghe Zone, it might not be appropriate to generalize and show the whole picture of the regional or country's modular training programme based on the findings of this study, since there are a number of factors which create differences.

However, it could assist somehow, the policy makers and those who are engaged in the modular training to improve the status of the programme in the future, coupled with other similar studies. Due to resources and time limitations, this study was restricted to a total of four PAs of Mi'eso woreda and limited number of sample respondents to justify the objectives of the study. However, all possible measures were taken together to have qualitative and quantitative data to rationally support the research design and to draw valid inferences.

1.6. Significance of the Study

It is hoped that the findings of this study will give insight into the deficiencies of the on-going modular training programmes and help the organizations and planers in the design future plans. On the other hand, adopting FTCs, as innovative strategy for modular and skill training for farmers is a recent practice in the region and the country. The findings of this study, in this regard will be of paramount importance to evaluate the modular training program, which has been designed at the regional level and currently used at FTCs in the grassroots level. Moreover, it helps indicate gaps for further research.

2. REVIEW OF LITERATURE

This chapter presents reviews of literature relevant to the themes of the study. The chapter is divided into four sections. The first section discusses theoretical concepts and empirical studies related to training approaches and processes. The second section deals with training effectiveness evaluation models. The third section depicts review of institutional aspects, coordination and linkages mechanisms and the remaining section presents the conceptual framework of the study.

2.1 Training

According to FAO (1991), training is a term which covers a wide range of activities. The length of a training activity can vary from a continuous employee improvement programme to an afternoon workshop. A training programme consists of several courses while a training course is composed of several sessions. NIOSH (1999), defined training as communication directed at a defined population for the purpose of developing skills, modifying behavior, and increasing competence. Generally, training focuses exclusively on what needs to be known.

Education is a longer-term process that incorporates the goals of training and explains why certain information must be known. Education emphasizes the scientific foundation of the material presented. Both training and education induce learning, a process that modifies knowledge and behavior through teaching and experience. The research model described here pertains to both training and education. Therefore, in this document, "training" refers to both processes (NIOSH, 1999). On the other hand, Dersal (1962) 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. Training is the process of acquiring specific skills to solve a specific problem and perform a job better (Jucious, 1963). It helps people to become qualified and proficient in doing some jobs (Dahama, 1979).

2.1.1. Farmer training and adult learning

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. Lindeman (1926) laid the foundation for a systematic theory about adult learning. (Knowles *et al.*, 2005), with such insightful statements as these: the approach to adult education will be via the route of situations, not subjects. In conventional education the student is required to adjust himself to an established curriculum; in adult education the curriculum is built around the student's needs and interests. Every adult person finds himself in specific situations with respect to his work, his recreation, his family life, his community life, etc. - situations which call for adjustments.

The field of adult learning was pioneered by Knowles (Knowles *et al.*, 2005). On the other hand, Stephen (2000), noted that, an effective training effort involves understanding how adults learn best. Compared to children and teens, adults have special needs and requirements as learners. Subject matter is brought into the situation, is put to work, when needed. The resource of highest value in adult education is the learner's experience. If education is life, then life is also education. Too much of learning consists of vicarious substitution of someone else's experience and knowledge. Experience is the adult learner's living textbook. Holton (1996) describes that, experiential learning approaches have the dual benefit of appealing to the adult learners experience base as well as increasing the likelihood of performance change after training.

2.1.2. Farmers' Training Centers

Obviously, the Agricultural Development Led Industrialization (ADLI) strategy is formulated after critical review of past experiences as overarching policy response to Ethiopia's food security and agricultural productivity challenge. The strategy promotes the use of labor-intensive methods to increase output and productivity by applying chemical inputs, diversifying production, utilizing improved agricultural technologies (MoARD, 2007). ADLI also emphasizes the importance of distinguishing agro-ecological zones and tailors strategies as well as interventions for optimal development outcomes.

One of the specific policy measures to improve agricultural productivity and promote food security is agricultural extension service. A key feature of this innovative policy measure is the deployment of extension workers to every rural PA in Ethiopia to facilitate sustained knowledge and skills transfer to smallholder farmers. However, in a situation where many farmers are illiterate, acquiring competence in production, adding value, and marketing presents challenges. Recognizing this fact, the Government's response includes increasing the number and education level of Development Agents through providing extensive technical vocational education and training (TVET) in agriculture and through the establishment of Farmers Training Centers (FTCs) to transfer improved agricultural technologies and give adequate services at a closer reach. FTC-based extension activities will give due emphasis to gender integration the services will identify activities that will benefit both women and men.

FTCs are used as local-level focal points for farmers to receive information, modular training, demonstrations, and advice, and include both classroom and demonstration fields. They are expected to form an important node between extension and farmers in the agricultural sector (IFPRI, 2007). Moreover, Birhanu *et al.*, (2006), noted that, FTCs are also expected to serve as hubs for the transfer of improved technologies, knowledge and skill development, and the provision of other institutional support services. Overall, FTCs are designed to provide extension services required for transforming agriculture from the current subsistence to market-oriented production system.

Specifically FTCs are expected to serve the following functions:

- regular extension services
- modular training
- center for information on agricultural marketing, type and quality of marketable products with specific standards and prices
- weather condition and forecast
- demonstration of improved technologies and techniques
- advisory service etc.

As the objective of this study is evaluation of effectiveness of the modular training at FTCs, the following paragraphs present discussions on the design and implementation of modular training.

2.1.3. Modular training

Oromia Bureau of Agriculture and Rural Development, (OBoARD, 2008), defined the modular training as a short term curriculum-based training in which training course materials are compiled in modules and provided for farmers to enable them acquire knowledge and skill of specific agricultural production methods which is warranted by “The Green Certificate.” “The Green Certificate” is a vocational qualification warrant (authorization) recognized by government for the farmers who have acquired knowledge and skill for a specific job /area/ of agricultural production method. Development agents assigned at FTCs are trainers of the modular training.

The main goal of the modular training is to enable farmers produce quality products and become competent in markets. This could be enhanced through skill-oriented farmers’ training on specific agricultural production methods for a period of six months (MoARD, 2007). On top of this, the role of extension as Birhanu *et al.*, (2006) indicated, is more critical for commercial oriented farmers than for subsistence farmers. When farmers produce primarily for the market (both domestic and export markets), quality and standard of the produce become much more important than during subsistence production, since competitiveness depends partly on quality of produce. Meeting quality of produce depends heavily on the use of the right technologies and methods of production.

Organization of FTC-based modular training,

According to the directive (MoARD, 2007), offered on implementation of FTC-based modular training, the training programme is organized as presented below.

1. Areas of training: FTC-based modular training is proposed in three broad areas of Animal Sciences, Plant Sciences & Natural Resources Management taking up entire processes from production to marketing.

2. Bases of design: the training is designed based on a given marketable crop or livestock commodity with comparative advantages in specific agro-ecological zones of our country.

The rural development strategy divides the country into three main agro-ecological zones, which include regions with adequate rainfall, moisture stress areas, and pastoral areas. In terms of pastoral areas, major interventions include improving livestock quality, expansion of animal health services, water points, feed production and improvement of breeds and development of market infrastructure (MoARD, 2007).

3. Courses: for each area of specialization (specific production methods), training courses are designed.

4. Curriculum guideline: each training course has a curriculum guideline with the goal of specifying the content of training keeping the logical sequence in appropriate theoretical and practical learning and application. Moreover,

(i) each course is divided into duties;

(ii) each duty is sub-divided into tasks;

(iii) each duty and task has got specific objectives;

(iv) each task has training contents, duration, methods, aids and evaluation procedures.

5. Specialization: farmers can specialize entirely or partially in one of areas of specialization.

6. Proportions: the training in each course consists of 80% practical and 20% theoretical sessions.

7. Facilities: reference books, magazines, library, class rooms, demonstration sites, livestock rearing site and water points need to be fulfilled. In addition to this, sites of model farmers, private farms, rearing stations and sites of NGOs will serve for practical demonstrations.

8. Green certificate: to graduate in Green certification system, each trainee should attend the training: two days per week, 6hrs per day 12hrs a week, 48hrs a month, totally 300hrs in six months.

9. Decisions: decisions concerning determination of training time and days should follow as per the agreement with trainees and trainers.

10. Training methods:

- (i) class room lecture and discussions with the aids of blackboard, flip chart, video show etc;
- (ii) practical training in workshops wherein both trainers and trainees should practically work;
- (iii) practical demonstration in the field;
- (iv) field visits and experience-sharing;

11. Criteria for trainees' selection:

- i. completion at least eighth grade of the formal education;
- ii. completion of the selected courses of modular training provided in the FTC for a time of six months or 300 hours;
- iii. attendance of more than 75% of the time scheduled for the training; and
- iv. promotion of skill testing offered by external examiners

12. Monitoring and Evaluation

Monitoring of modular training is conducted continuously by FTC/ PA-level extension unit and woreda level experts to make sure that, the required actions and practices are proceeding according to the plan. FTC level extension unit consists of PA chairman, PA manager, 3 DAs, representatives

of women, youth and other two model farmers and is responsible for planning and implementation of PA level development activities including management of FTCs functioning (MoARD, 2007). Thus, woreda level experts' team (SMSs) together with FTC-level extension unit continuously monitor during implementation and provide technical backstopping if the team encounters a difficulty it should be reported to higher levels for flexibility and modifications for better adaptation.

The directive also indicates that, evaluation is conducted after completion of each training course to determine the effectiveness of the training. Terminal evaluation is carried out both in classrooms and in the fields. Test items to be used for evaluation are interviews, practical test, group work, written examination etc. Evaluation is done after developing criteria and skill test items. Trainees attended the training and successfully promoted the skill-test are awarded the Green certificate.

Purposes of FTC-based modular training programme

Participants of the modular training, after successful completion, are expected to achieve the following objectives:

- (i) actively participate in regular extension activities, adopt improved technologies and share experiences for others;
- (ii) become market-orientated producers and competent markets;
- (iii) properly use information provided on weather condition and forecast and timely application on own farm;
- (iv) properly handle costs and benefits analysis on production and marketing of commodities;
- (v) self-motivated in adoption of time and labour-saving technologies and commitment in management of natural resources;
- (vi) sustainably produce quality products in the field of specialization; and

- (vii) organize in cooperatives with similar farmers to facilitate credit from lending agencies by themselves and become successful in mutual efforts.

2.1.4. Training approaches and processes

According to Rama *et al.*, (1993), there are three approaches to training: (1) the traditional (academic) approach, (2) the experiential approach, and (3) the performance-based approach. In the traditional approach, the training staff designs the objectives, contents, teaching techniques, assignments, lesson plans, motivation, tests, and evaluation. In the experiential approach, the trainer incorporates experiences where in the learner becomes active and influences the training process. This approach emphasizes real or simulated situations in which the trainees will eventually operate.

Trainers primarily serve as facilitators, catalysts, or resource persons. In the performance-based approach to training, goals are measured through attainment of a given level of proficiency instead of passing grades of the trainees. Emphasis is given to acquiring specific observable skills for a task. This performance-based teacher education (PBTE) model, developed by Elam (1971), is mostly task or skill centered and is also applicable to non-formal educational organizations such as extension. There is disagreement between training approaches to be followed and practically done for the modular training in this study.

As indicated on the extension strategy (MoARD, 2007), extension messages should be developed on the bases on the needs and priorities of target groups as identified and developed based on participatory approaches. However, the approach virtually followed in designing and development of FTC-based modular training is of traditional and academic model, where, training staff of the Federal and regional level bureaus design the objectives, contents, teaching techniques, aids and evaluation mechanisms with out involvement of target people the grassroots level.

2.2. Designing training programme

Training is a circular process that begins with needs identification and after a number of steps ends with evaluation of the training activity. A change or deficiency in any step of the training process affects the whole system. Designing a training and development program involves a sequence of steps that can be grouped into five phases: needs assessment, instructional objectives, design, implementation and evaluation. To be effective and efficient, all training programs must start with a needs assessment (Wentling, 1992).

2.2.1. Training needs assessment

Training needs assessment is one of the crucial steps towards identifying the area of farmers' interest, design and development of curriculum that can best suit to the existing real conditions of farmers. Pholonngoe 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. Thus, training assessment has to be carried to design relevant and need- based training programme that can accommodate changes over time. Barbazett (2006), also noted that, long before any actual training occurs, the training institution must determine the "who, what, when, where, why and how of training." Some changes are achievable using a training intervention, others are not. Some changes are more critical than others.

Training needs assessment process helps determine the priority of changes in knowledge, skill, attitude and behavior that will provide the greatest impact on achieving organizational or individual goals. On top of this, Caffarella (2002) noted that, a systematic process of farmers' training must include; needs assessment, goal and objectives setting, organizing instructional methods and techniques, monitoring and evaluation. In some cases, however, we lack the knowledge, skills, or tools to conduct an effective assessment or we are confused about which approach to use, given the wide array of choices.

How often the needs assessment process should be repeated is a difficult question to answer. Conducting training needs assessments is an exhaustive, time - consuming, and expensive process that yields tremendously important data. Training needs identification is possible through different analytical procedures (McGhee and Thayer, 1961). For instance, individual analysis aims at identifying specific training needs for an individual or group of people so that training can be tailored to their needs. This analysis centers on individuals and their specific needs concerning the skills, knowledge, or attitudes they must develop to perform their assigned tasks. The possible methods or techniques for individual analysis include performance appraisal, interviews, questionnaires, tests, analysis of behaviour, informal talks, checklist, counseling, critical incidents, recording, surveys, and observations.

2.2.2. Training content and relevance

Once training needs have been identified and training activities have been decided as part of the solution, a needs analysis should be done to determine knowledge, skills, and attitude requirements and performance deficiencies. The needs analysis procedure involves breaking down the "training problem" into its basic parts in different successive phases to identify and understand the important components in each phase. Ultimately it leads to identifying and understanding the training content to relevant and need based. This means, that theories and concepts must be related to a setting familiar to participants (Barbazett, 2006).

This need can be fulfilled by letting participants choose learning projects that reflect their own interests. Curriculum development is the most important part in a training programme after a need for training has been identified. The curriculum specifies what will be taught and how it will be taught. It provides the framework and foundation of training or training content (Miller and Osinski, 2002).

2.2.3. Learning objectives

A learning objective description must embody perceptible testable behaviour. The best way of selecting this activity is by identifying what is to be able to do once the lesson is finished.

The learning material must be defined as concretely as possible. The objectives should clearly define the applicability of the learning material. The minimum performance must be defined. The learning objective must give some indication of the standard of performance so the students can be sure about how the task must be performed. Specify the frequency, quality and accuracy. In a learning objective describe the conditions under which the desired behaviour must be defined. Specify the circumstances under which the standards should be fulfilled (Bekkering, 1992).

Taxonomy of knowledge and skill

In Romiszowski's taxonomy (Bekkering, 1992) a distinction is made between knowledge and skills that trainers should bear in mind while setting training objectives. Knowledge is acquired facts and information that are available for recall and an understanding of the meaning of facts and that information. Knowledge is divided into; facts (details concerning concrete events, situations, people or matters), procedures (assignments that consist of a step plan), concepts (definitions of abstract matters, for example, freedom, and intelligence) and principles (rules or patterns (if ... then ... statements)).

The transfer of skills is much more important to Romiszowski than just the transfer of knowledge. Attained information must be put into practice in an effective and efficient manner (Standaert and Troch, 1987). In other words, it must be expressed in skills. Romiszowski subdivides skills into: Cognitive skills, such as decision-making, problem-solving, logical thinking; psychomotor skills, such as the performance of actions and techniques (practice); reactive skills, such as being conscious of and acting in accordance with a value system, interactive skills in the fields of social intercourse, communication and leadership.

In this study, of the various skill categories discussed above, psychomotor skills, such as the performance of actions and techniques related to improved technologies treated in the modular training offered were measured by employing a practice test designed based on objectives of training courses. Attitude is the degree of favourableness and unfavourableness towards an object, idea or stimulus. Or it can be defined as, the positive or negative outlook towards a given spur.

According to Tesfaye (2003), attitude is the disposition to respond favourably or unfavourably to an object, person or institution. He adds that the characteristics of attribute are its evaluation that reflects a positive or negative evaluation of the attributed object. Attitude is non-overt and can only be inferred from verbal or non verbal responses.

2.2.4. Training Methods

A training method is a strategy or tactic that a trainer uses to deliver the content so that the trainees achieve the objective. Selecting an appropriate training method is perhaps the most important step in training activity once the training contents are identified. A training programme has a better chance of success when its training methods are carefully selected. Four major factors are considered when selecting a training method: the learning objective, the content, the trainees, and the practical requirements (Wentling, 1992). However, Zeleke (2000) noted that, all training methods in developing countries are based on common principles. However, training methods differ from one place to another. Some instructional methods may be theory-oriented, and others may be practical-oriented. Thus, training methods have to selected based on training needs of specific target population.

2.2.5. Sustainability of training programmes

Continuity in training is a three-stage process of learning, practicing and reviewing performance. For most training programmes this process is possible only if there are further targets to aim for. Such goals might include reaching out to other groups in areas where training is needed or updating skills and knowledge. These targets must reflect ‘real’ needs and must be based on realistic levels of expectation rather than aiming for further training activities per se.

To put in positive terms continuity and sustainability of training depends on: commitment to the idea, wide net of support, good leadership, continuity of financial and political support, collaboration amongst various institution, experienced training staff indigenous resource people, improved performance due to training, success stories that can be publicized and duplicated, tangible results, proved need for training (Ranjan, 2008).

The continuity of training programmes depends upon rapid institutionalization of training. There can be different 'homes' for training. The appropriate option will vary from country to country, organization to organization, depending upon the existing organizational structure of disaster management, availability of resources etc (Ranjan, 2008).

2.3. Measuring Training Effectiveness

Effectiveness is defined as a measure of the extent to which an activity achieves its objectives. Objective is a goal or end which describes what is to be accomplished if the training activity is to be effective. Relevance is the degree to which the rationale, objectives, and expected impact of an activity are, or remain pertinent, valid and significant with regard to long-range objectives or identified priority needs and concerns (FAO, 1991). On the other hand, Miller and Osinski (2002) defined relevance, in adult training context, as identifying and understanding the training content to be relevance-oriented in a sense that, the theories and concepts must be related to a setting familiar to training participants. Learners must see a reason for learning something. Learning has to be applicable to their work or other responsibilities to be of value to them.

For measuring effectiveness of training various approaches are suggested in literature. For instance, Mohan (2000), gives an update on one of the most popular techniques, the Donald Kirkpatrick model, which is one of the most popular methodologies, suggested four criteria to evaluate training programmes: (1) reaction, (2) learning, (3) behaviour, and (4) results. Each criterion is used to measure the different aspects of a training programme. Reaction measures how the trainees liked the programme in terms of content, methods, duration, trainers, facilities, and management.

Learning measures the trainees' skills and knowledge which they were able to absorb at the time of training. Behaviour is concerned with the extent to which the trainees were able to apply their knowledge to real field situations. Results are concerned with the tangible impact of the training programme on individuals, their job environment, or the organization as a whole. Kirkpatrick found that, it is easy to measure training programmes related to technical and functional areas at level-3 and level-4. It is not easy to do this with behavioral skills programmes.

Organizations that choose to measure training effectiveness can start with the former category before moving to measuring behavioural skills at level-3 and level-4. There are also mechanisms to measure effectiveness of behavioural skills at level-3. These are cumbersome to implement. It needs a fair amount of investment by the organization in terms of time and money. Kirkpatrick (1976) also suggested to organizations that embark on measuring effectiveness of training is to measure all programmes at level-1 and level-2. The measures at level-3 and level-4 can start with the functional skills, before moving on to the behavioral skills programmes. John (1998), outlined variety of ways to measure training effectiveness including, prior to training, at the end of training, delayed impact (non-job), on the job behavior change, on the job performance change.

Crabtree and Miller (1992), also suggested two approaches to training intervention effectiveness research to uncover results without committing extraordinary resources. One approach employs triangulation (use of multiple data sources and methods) to gather data from prospective end users and combine qualitative data (e.g., from focus groups, interviews, and observations) with various forms of quantitative data (e.g., those from controlled study situations). Data are then used to assemble a valid argument for the interpretation of results. The other approach to effectiveness research explores cause-and-effect relationships that are pertinent to the learning process and have been established through years of training research, including meta-analyses.

For the purpose of training assessment, the cause-and-effect relationships of interest are those between the process, outcomes, and impacts of training. In these relationships, the process variables (e.g., training methods and mediums used) are indicators of the outcomes (e.g., knowledge gained among trainees) (Borich 1998). To identify the elements of training that are critical to increased effectiveness, the Education and Information Division (EID) of the National Institute for Occupational Safety and Health (NIOSH, 1999) of USA has developed a research guide known as the training intervention effectiveness research model (TIER model).

The TIER model is designed to (1) take into account the challenges of identifying factors that make the training-learning-action continuum successful, (2) logically match research efforts with the nature of the question(s) at hand, (3) minimize training and curriculum development risks, and (4) concentrate research resources. The TIER model is applicable to training interventions on a variety of topics (Gagni, 1985).

Four Stages of the TIER Model

The TIER model systematically structures training effectiveness research across four stages (see figure 1). Stages 1 and 2 are components of formative evaluation in which the objectives and processes of training are conceptualized, drafted, and refined. During these stages, researchers explore instructional alternatives to determine which are most appropriate for study. Stages 3 and 4 are components of summative evaluation systematic attempt to determine whether the fully developed training intervention is meeting its objectives as planned or desired (Scriven 1967, 1991).

Stage 1: Formative Research

In Stage 1, training efforts are conceived, reviewed, and structured. This stage helps researchers understand the population to be served, its needs, and the aims of instruction.

Stage 2: Process Research

In Stage 2, draft training materials, proposed instructional approaches, and research instruments are field tested in pilot sites. The qualitative and quantitative information that is collected from the field testing leads to the modification of materials and increased confidence in the approaches taken.

Stage 3: Outcome Research: involves a controlled evaluation study. The results of the training effort are documented. These data provide the researcher with improved understanding of the various training approaches that can be applied to (1) the population trained, (2) the subject matter addressed, and (3) the instructional methods us

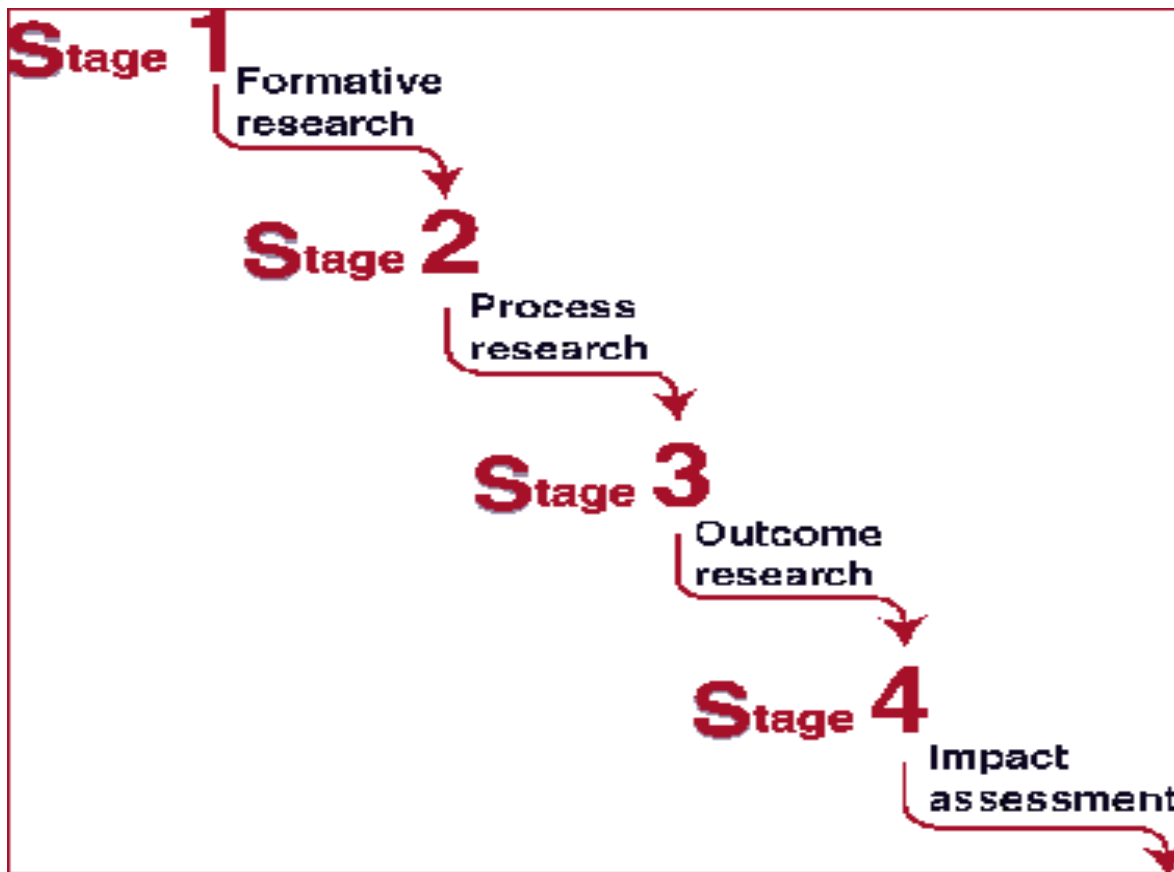


Figure 1 Model for training intervention effectiveness research

Stage 4: Impact Assessment

In Stage 4, longitudinal studies are conducted. This stage will also examine the impact of study-related materials (e.g., model curricula, published reports) as they are applied to practice.

Overall, the training intervention effectiveness research model, a research project can systematically work through all stages the training before and during training. Alternatively, research can begin or occur at any stage or subset of stages of the model, depending on the state of the training materials and the nature of the research questions (Loos, 1995). The objective of reviewing and presentation of this model is to offer clue of related literature relevant to measuring effectiveness of training programmes in a given context.

However, this model, as the name indicates is intervention research (field – based action research), and hence, doesn't have any link with the current thesis research as the objective is to measure effectiveness of the modular training after a few years of implementation.

FAO (1991), on the other hand, defined evaluation of training as a process which attempts to determine as systematically and objectively as possible the relevance, effectiveness and impact of training activities in the light of their objectives set forth. Evaluation can be done during each development phase of training and even at each step during the delivery of the training activity. The major types of training evaluation consist of: evaluation for planning (TNA), methods-materials (evaluation for training methodologies), process evaluation (during training to make adjustments), terminal evaluation (after the end of training) and follow-up evaluation (impact assessment).

In this approach, effectiveness of training is measured in terminal evaluation. Terminal evaluation is used to determine the effectiveness of a training activity after it has been completed (FAO, 1991). It is a method for collecting information on trainee and training activity achievement. The primary objective of terminal evaluation is to determine the degree to which the intended training objectives and goals have been met and to relate these findings to evaluation information collected earlier in the training process. It also includes interpretation of the outcome. In other words, were the objectives achieved? If so, how well, and what areas still need to be strengthened? If not, why not?

The main focuses of terminal evaluation are:

- **Learner performance:** - by comparing Pre-training versus pos-training measurements. (Learning gains), norm-referenced method. - By comparing what we intended the trainee to learn (objectives) against what has actually been learned (performance/competence) criterion referenced evaluation.
- Organisation, facilities, and resources during the training.

- **Trainees overall impression:** competency of trainees, communication, facilitation, approach and trainees reaction to training/instruction such as, relevance of contents, methodologies, duration etc. This kind of evaluation information gives some idea as to the possible reasons for success or failure in achieving training goals.

2.4. Measuring trainee knowledge, attitudes and skills

According to Norman, (1986), training programmes are designed to change trainee knowledge, attitudes and skills. In terminal evaluation we want to see if our training has accomplished this goal and to what degree. The most common method used in a terminal evaluation is to test trainee knowledge, attitudes and skills. Each of the three kinds of learning can be measured through some form of testing. Test results are then compared either with pre-determined standards (as specified in objectives), with entry level knowledge (as measured by a pre-test), or through certification tests where standards are set by someone else. The common procedures in terminal evaluation are:

1. Develop or adapt existing data collection questionnaire. Decide what type of test items should be included.
2. Administer the instruments. The way in which these instruments are administered varies with many factors, such as audience characteristics (age, sex, education level etc), objectives being assessed, and type of assessment instrument.
3. Interpret the results.

Anthony (1983), outlined commonly used Teacher-Made Test items to measure knowledge, attitude and practice levels.

Fill in blanks: are effective for measuring a wide range of simple learning outcomes; knowledge of facts, terminology, principles, methods and procedures, and interpretations of data.

True/false: used to measure trainee ability to identify the correctness of statements of fact, definitions of terms, and statements of principles.

Matching: to measure trainee ability to identify the relationship between two things.

Multiple choices: used to measure different kinds of more complex learning: vocabulary, facts, principles, methods, and applications and interpretation of facts.

Essay: are useful in the measurement of complex achievement. This includes the ability to recall, organise, and integrate ideas; the ability to express oneself in writing; the ability to supply rather than merely identify interpretations and applications of data

Agree/Disagree: are similar to can do/cap do items. They present crucial attitude statements to trainees who then indicate how they feel about them. They are used to measure intensity of opinion.

Can do/Cannot do items: used to let trainees estimate their own confidence in achievement of training objectives. They express whether they think they can or cannot perform the objectives.

Overall, in order to fulfil the objectives of the study, after an in-depth review of the different approaches to measurement of training effectiveness, the terminal evaluation approach suggested by FAO (1991) was considered very relevant to measure effectiveness of the modular training offered in the study area.

2.5. Institutional and Organizational Aspects of FTCs

In order to fulfil the third objective of this study, literature related to institutional and organizational support aspects of FTCs which are needed to facilitate the application of knowledge acquired and skills gained as the result of modular training were reviewed and discussed in the following sub-sections.

According to North (1990), institutions are the rules of the game in a society or, more formally, are humanly devised constraints that shape human interaction as rules of the game or constraints that shape human interactions. In this research, institutions refer to those institutional support services such as, inputs supply, credit and product marketing needed to facilitate the application of knowledge acquired and skills gained through the modular training offered in the study area.

2.5.1. Inputs supply and credit

World Bank (2005) noted that the effectiveness and efficiency of extension services is contingent upon the overall policy environment for agricultural development. Availability of credit and inputs supply services and availability of stock of appropriate technologies can be limiting factors for agricultural development (FAO, 1998). There is growing evidence that the major factor explaining low adoption of technology in Africa is lack of appropriate institutional and policy support (Kedir, 1998). As reported by Van Den Ban and Hawkins (1998), adoption of improved technologies is strongly affected by the policy environment like input supply, market, credit, price policies and improved supply system.

Chambers *et al.* (1989) noted that, access to credit is one way to improve farmer access to new production technology and increase productivity. If appropriate technology is available but not being used by farmers, then the way credit is handled by government may be part of the problem. Understanding the credit context - government and bank policies, availability of credit, and the institutional relationships involved in its delivery - is important for extension (FAO, 2005).

2.5.2. Product market

In most cases markets provide opportunities for smallholders to improve their incomes and livelihoods. The value chain approach, which emphasizes 'trans-boundary' linkages, complements the 'territorial-bounded' innovation systems approach (Altenburg *et.al*, 2007). The value chain approach links local innovation systems with regional, national, and global forces.

Agricultural markets play a key role in the lives of poor people in developing countries. Rural households, however, are subject to a number of constraints that make their participation in the market both costly and risky, often leaving them “unconnected” (Nicholas and Ruth, 2007). There is however, a concern that smallholder producers may be excluded from the emerging value chain due to capacity limitations. They lack the necessary technological, organizational and institutional capacity for successful participation in the value chain. Yet, these problems are not insurmountable with appropriate organizational and institutional innovations (Co stales *et al*, 2006).

2.5.3. Cooperatives

Cooperation has always been a feature of mankind though the foundation of modern cooperative movements dates back to the late 18th and 19th centuries (Mekonnen, 2007). Cooperative societies today play significant role in the economic development of nations both developed and developing. Feedback on farmer needs, and the results of adoption from such groups will be increasingly important considerations (FAO, 1998). According to IFAP (1993), farmers’ voice cannot be obtained without farmers’ organizations. To engage in any sensible dialogue with the rest of society, farmers need their representative organizations, the farmers’ organizations, structured from grassroots level, as their legitimate voice. Similarly, MoA (1995) emphasized organization of farmers as a key function of extension. It was believed that self-reliant rural society, which takes on its development affair will be, realized when farmers are organized.

2.5.4. Organizational management aspects

According to North (1996), organizations are made up of groups of individuals bound together by some common purpose to achieve certain objectives. Thus, organizations include government bodies (e.g. extension organizations, regulatory bodies, associations, education/ training institutions. In this research, organization refers to the currently functioning organizational dimensions of FTCs at grassroots level, such as, formal mandate given to FTC level management committee, task and performance management, staff managements, salary administration, financial

and material resources management rules, procedures and incentive mechanisms. True decentralization is one that recognizes and respects peoples' right. From the rights based development perspective development means that, control over their destiny must be returned to the people themselves (Habtemariam, 2007). It is not therefore an option but an obligation for extension to be closer and hand over the stick to the society.

2.5.5. Coordination and linkages mechanisms

Collaboration and networking between actors is a necessary condition for successful introduction of agricultural technologies; whereas, linkage mechanisms refer to organizational arrangements (e.g., meetings or administrative relationships) that help to link up the parts of the system. Coordination (e.g. mutual adjustment of activities), or resource transfers (perhaps credit, salary payments or shared labour) are important for effective extension work (Salomon and Engel, 1997). Habtamariam (2007) also noted that, proper definition of roles and establishing clear line of authority among government institutions are very important. In many developing countries, lack and shortage of relevant and appropriate technologies to improve productivity is a major constraint confronting the extension service, a problem which is more serious in rain fed, resource poor environments (Purcell and Anderson, 1997).

Part of the reason for the lack and shortage of appropriate technologies is the weak linkage between research, extension and farmers. Agricultural research organizations are extension's closest institutional partners in technology generation and transfer. The way research is structured and organized, and the planning and management of research-extension linkages, can limit or enhance extension's effectiveness (FAO, 1998). Agricultural research organizations in developing countries confront many problems (Oram & Bindlish, 1984; Idachaba, 1987). These include lack of financial resources, acute shortages of well-trained scientists, lack of farmer feedback to ensure relevance of research results, lack of access to external sources of knowledge, inadequate research facilities and equipment, low staff morale, and inadequate operating budgets, staff incentives, and remuneration (FAO, 2005).

Socio-cultural factors are leading constraints to the effectiveness of extension. Language differences and Illiteracy can impede the communication of improved technology unless they are taken into account. The division of labour between the sexes can differ along cultural lines and influences the nature of farming systems in different regions. In extension organizations, under representation of women on the extension force means that the production responsibilities and needs of women at the farm level may not be adequately addressed (FAO, 1998). Although the role of women in agricultural production and marketing has been well recognized, there is gender bias in the service, whereby the majority of the beneficiaries are male (Anandajayasekaram, *et al.*, 2005). In particular, these are reflected in land-use strategies. Pastoral herders, for example, will require different types of subject-matter (FAO, 1998).

2.5.6. Analytical tools of coordination and linkages mechanisms

Rapid (relaxed) Appraisal of Agricultural Knowledge Systems (RAAKS) is a methodology that has been designed and tested to help stakeholders gain a better understanding of their performance as innovators. RAAKS is based upon what has been called a ‘soft systems’ methodology (Checkland and Scholes, 1990). RAAKS is distinguished by its focus on the social organization of innovation from well-known PRA (participatory rapid appraisal – Chambers, 1992) and PTD (participatory technology development (Zeeuw and Veldhuizen, 1992). PRA focuses more on analysing local farming and livelihood systems and general conditions enabling and/or constraining their development; PTD helps to create a process of creative interaction between local community members and outside facilitators.

Thus, RAAKS complements both PRA and PTD. In practice, RAAKS often combine techniques from these and/or other participatory approaches. According to Salmon and Engel (1997), many reasons may necessitate the use of RAAKS study and implications for the design and implementation of the study. For example, the problem may seem to be that farmers do not participate actively enough in extension programmes; the intention is therefore to suggest ways to

increase their participation. Or the problem seems to be of a more institutional sort, such as a lack of coordination between research and extension; this could make improved cooperation desirable, to avoid duplication of effort and a waste of government funds. RAAKS uses a variety of windows, to achieve a fundamental analysis, a transparent problem definition and recommendations for action. Each window therefore provides a different view of the situation we are studying. This does not mean that all windows are mutually exclusive; overlap has been carefully built in (Ibid).

2.5.7. Positive deviance of the study area

Positive deviance is a Latin word “de” means “from”, “via” means “road” then deviant means “of the beaten path”. Positive deviance means departure from the norm which results in a positive outcome. Deviance is one that differ from a norm, especially a person whose behavior and attitudes differ from accepted social standards (PDI, 2010). 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, behaviours enable them to function more effectively than with the exact same resources and conditions (Sternin, 2006).

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 asset based, problem solving, and community driven approach that enables the communities to discover successful behaviours and strategies and develop a plan of action promote their adoption by all concerned. This approach was adapted by Jerry Sternin in Vietnam, who promoted the concept with his wife Monique about child nutrition.

Positive deviance focuses on new application approaches to address issues and promote new ways of doing. This approach enables communities to solve interact able problems, which require behavioural and social change by offering workshops, trainings, technical support and on-line resources (Sternin, 2006). Important perspectives of positive deviance are to be clear the cause of unsustainable development and urgency and scale of the challenges.

Consider the reasons for change. A growing number of people are practicing positive deviance. Therefore, positive deviance as a strategy can be recommended (Sara, 2010).

2.6. The Conceptual Framework of the Study

This study focuses on modular training offered for farmers since 2007, especially the relevance and effectiveness of the training in changes in farmers' knowledge, attitude and practice levels, and institutional and organizational dimensions FTCs functioning. To analyze these processes there is a need to frame the research into major areas where the researcher needs to focus to address the research questions.

2.6.1. Systematic TNA and implementation processes

Systematic needs assessment is a comprehensive process involving: deciding the target population; defining and identifying needs; measuring competency short comings; prioritizing; and setting training objectives in the light of assessment findings. This helps better designing of relevant and need-based training and implementation which will result in better outcome.

2.6.2. Training inputs and activities:

Training inputs and activities are presumed to cause or influence certain training outcomes. These variables could include timing, format (organization), and location of training, training content, or training approach under study (Gagnĭ, 1985).

2.6.3. Modifying Variables

Modifying variables can modify the influence of training inputs and activities on training outcome. Learner variables (age, sex, education level, distance from FTC, etc.), trainer variables (communication and facilitation skills, teaching style, etc.), and context variables (class size, theory versus practical sessions, basic facilities and materials, etc.) can all modify learning outcomes.

2.6.4. Intervening Variables

Intervening variables are inferred concepts intended to explain the processes between stimulus (training inputs and activities) and response (learning outcomes). Such variables frequently relate to learner attentiveness, ability and motivation to learn, learning style, and individual coping mechanisms when ingesting new material (Dunn and Griggs, 1988). Intervening variables may also pertain to (1) the trainer's ability to engage learners with the subject matter, and (2) contextual attributes such as the structure and formality of the training organization.

2.6.5. Confounding Variables

Factors beyond the learner's control can influence training outcomes. Confounding variables are changes in institutional support services inputs supply, credit, facilitation of product marketing, other non - training factors that could influence learning outcome such as, linkages between FTCs and other relevant institutions.

2.6.6. Organizational management

For the effective functioning of FTCs there should be clear authority, agreed aims and good leadership with formally established rules, procedures and modes of operation. These include, task and performance management, resources (human, financial and material) and salary administration, staff development and incentive mechanisms.

2.6.7. Coordination and linkage mechanisms

To ensure effective collaboration and networking between relevant actors and help to link up the parts of the system, there should be coordination and linkage mechanisms.

2.6.8. Basic materials and facilities

An FTC which has different services like class rooms, offices, residence, exhibition center, workshops electricity, clinic, telecommunication, water etc. will offer better modular training.

2.6.9. Training methodology and teaching aids

Training methodology is the instructional styles used in imparting farmers training. If there is not involved in any way, very little will be remembered and the effectiveness of the modular training or the learning processes will be very limited. Teaching materials are teaching aids used during training to facilitate effective communication and learning.

This study assumes that the factors mentioned above have interplay with the effectiveness of modular training at FTCs level. Based on this assumption, the conceptual framework of the study is illustrated in Figure 2 below.

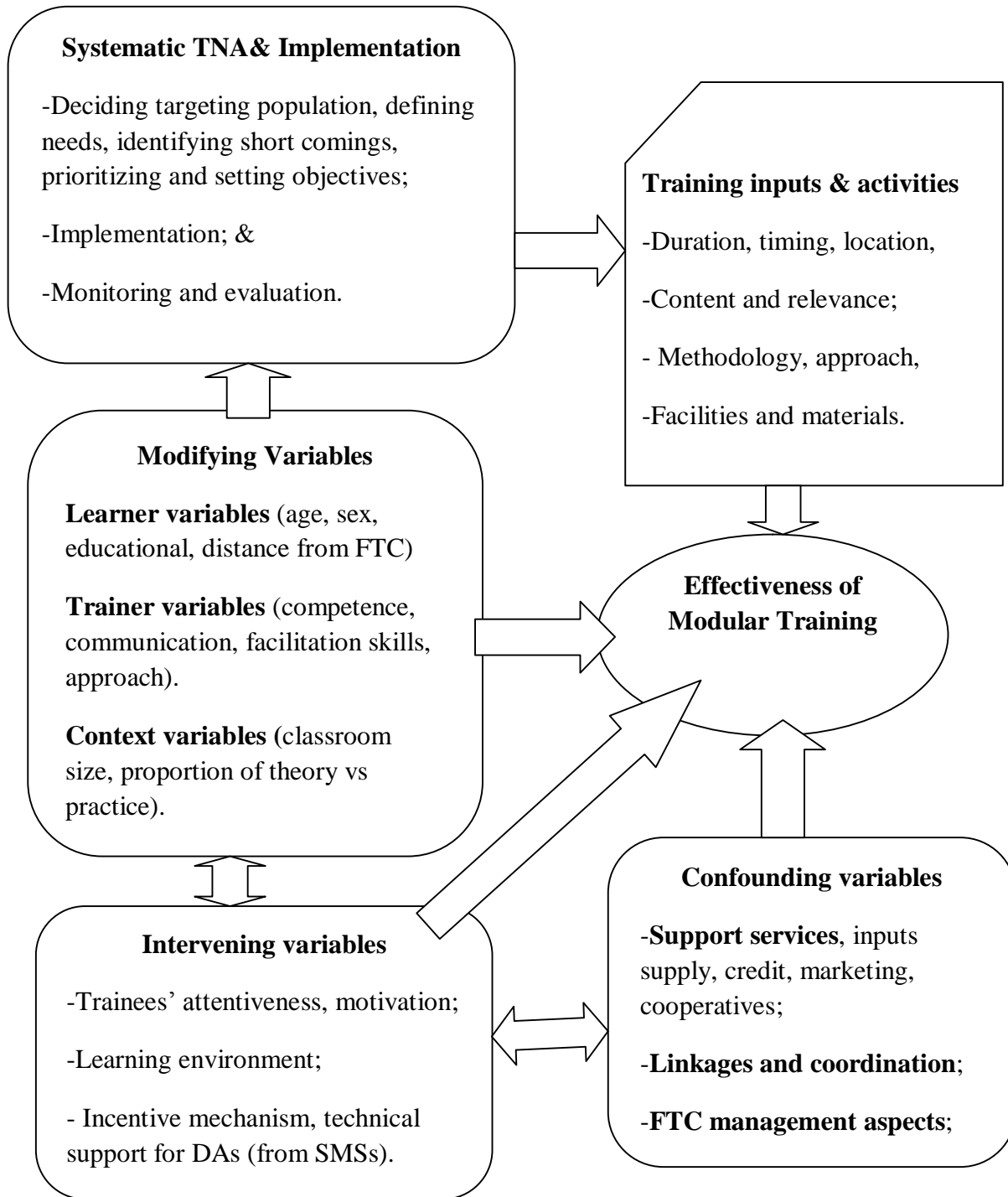


Figure 2 the conceptual framework of the Study

Source: Adapted from NIOSH (1999).

3. METHODOLOGY

This chapter describes the tools and techniques deployed for the study, including the study area description, sampling design and sampling technique, data sources and methods for data collection and data analysis.

3.1. Description of the Study Area

As this research is sponsored by ILRI-IPMS Ethiopia, the study area, Mi;eso woreda was pre-selected by the IPMS project management, because it was one of the project’s intervention area since 2005 (IPMS,2005).

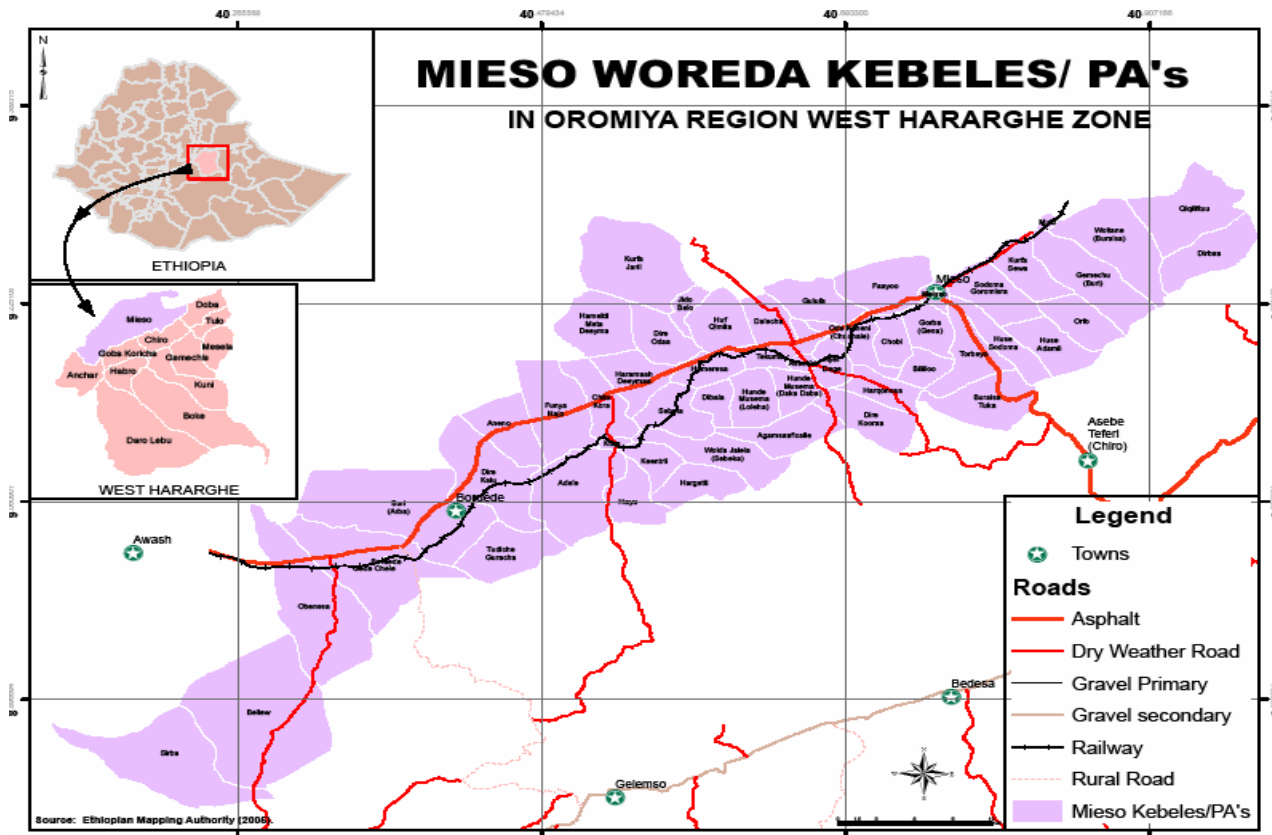


Figure 3 Map of the study area

Mi'eso is one of the pastoral and agro-pastoral woredas of West Harerghe Zone of Oromia region. Geographically, Mi'eso woreda is located between 40° 9' 30.1" W and 40° 56' 44" E; and: 9° 19' 52" N and 8° 48' 12" N, situated in the east of Addis Abeba at a distance of 290km, and 182km in the east of Oromia's regional Commercial Capital, Adama along the main Addis - Harar asphalted highway and the historical Ethio-Djibouti railway.

The 2007 national population and housing census (CSA, 2008) indicated that, the total human population of Mi'eso woreda is 130,458, of which 66,762 are males, and 63,696 females. It has total households of 21,017, in which 16,870 are male-headed (80%) and 4,147 female-headed. A climatic aspect of a given area includes three factors of altitude, temperature, and rainfall. The altitudinal range of Mi'eso woreda varies from 1107 to 3106 m.a.s.l., but most of the woreda is found at about 1700m masl (IPMS, 2007). Based on the digital data, the mean annual temperature is around 21°C, while average annual rainfall is between 635 and 945mm. However, the rainfall condition in the woreda is characterized by its erratic nature, which results in recurrent drought.

Two types of farming systems characterize the woreda, one is the crop/livestock or agro-pastoralism and the purely pastoralist system. From the total land area coverage, only 12% is estimated to be suitable for crop production. This reveals that the area is much of a rangeland where livestock rearing is the major activity (IPMS, 2007). Thirty five out of the 46 PAs of the woreda belong to Crop/Livestock or agro-pastoral system. The remaining 11 PAs predominantly depend on pure pastoralist system for making life. Currently, there are eight farmers' training centers in the agro -pastoral farming system PAs of the woreda and all FTCs are found in this farming system. Major marketable crop commodities are sesame and haricot beans, while, goats and cattle are the main marketable livestock commodities of the woreda.

Extension service in pastoral and rural development in the study area includes regular agricultural extension service, modular and non-modular inputs supply and animal health services that are mainly rendered by WoPRD. There are eight FTCs in the agro-pastoralist PAs, 4 clinics are providing animal health service in Mi'eso and three small towns of Asebot, Kora and Bordode.

Development agent to farmers' ratio is nearly 1:300 (WoPRD, 2009). Of the total FTCs in the area only five are equipped with basic materials (such as, black board, chairs, tables, cupboard, shelves etc.) and started modular training in 2007. These five FTCs in five PAs are supported by IPMS project. The remaining FTCs are not equipped with materials and yet started modular training.

3.2. Methods of Data Collection and Data Analysis

3.2.1. Sampling design and sampling technique

After a detailed secondary data analysis, field visit and discussions with field level DAs, woreda level management and experts, a multi-stage sampling strategy was followed to select sample PAs /FTCs/ based the objectives of the study. In the first stage, from PAs having FTCs and delivering modular training since 2007, two PAs (Tokuma and Gorbo) were selected based on maximum years of modular training, and from the remaining PAs which do not have FTCs two PAs were selected for the purpose of comparison. These PAs were Gulufa and Chachole that are located in distant areas from PAs selected with FTCs. These PAs were selected to reduce the possibilities of knowledge transfer from the trained to untrained farmers (see figure 4).

Major reasons considered in the sampling design were, first, comparison of differences in knowledge, attitude and practice levels between trained and untrained sample households as a result of the training; second, to analyze processes of designing and implementation of the training programme by collecting data from trained sample respondents, and to assess the institutional and organizational dimensions of FTCs to facilitate delivery of modular training and to identify positive deviance practiced in FTCs. In the second stage, sampling frames of trained farmers were prepared from the selected two PAs having FTCs (Gorbo and Tokuma). These sampling frames contained 80 trained farmers (38 and 42) and 70 trained farmers were randomly selected from these sampling frames.

In the third stage, the allocation of trained farmers for each PA was done equally, 35 each, with the purpose of having an option for substitution /replacement/a in the case of emergency. Moreover, three trained farmers from the sampling frame have migrated to Wollega zone for personal reasons, which was known before sampling was finalized. In the case of untrained sample respondents, simple random sampling was resorted to from the other two PAs. Similar to the procedure followed for the trained farmers, 70 untrained farmer respondents were equally allocated for the two PAs, 35 each were randomly selected from the two PAs to keep up consistency.

The reason for random selection of sample respondents from the sampling frame of both trained and untrained sample households was homogeneity in farming systems, in farmers' education status and exposure to extension services other than FTC-based modular training. Furthermore, four separate groups in four sampling PAs having 5-8 members each were selected using snowballing technique for FGDs. Here, participants were among sample and non-sample households, elders, young farmers, women and innovative farmers.

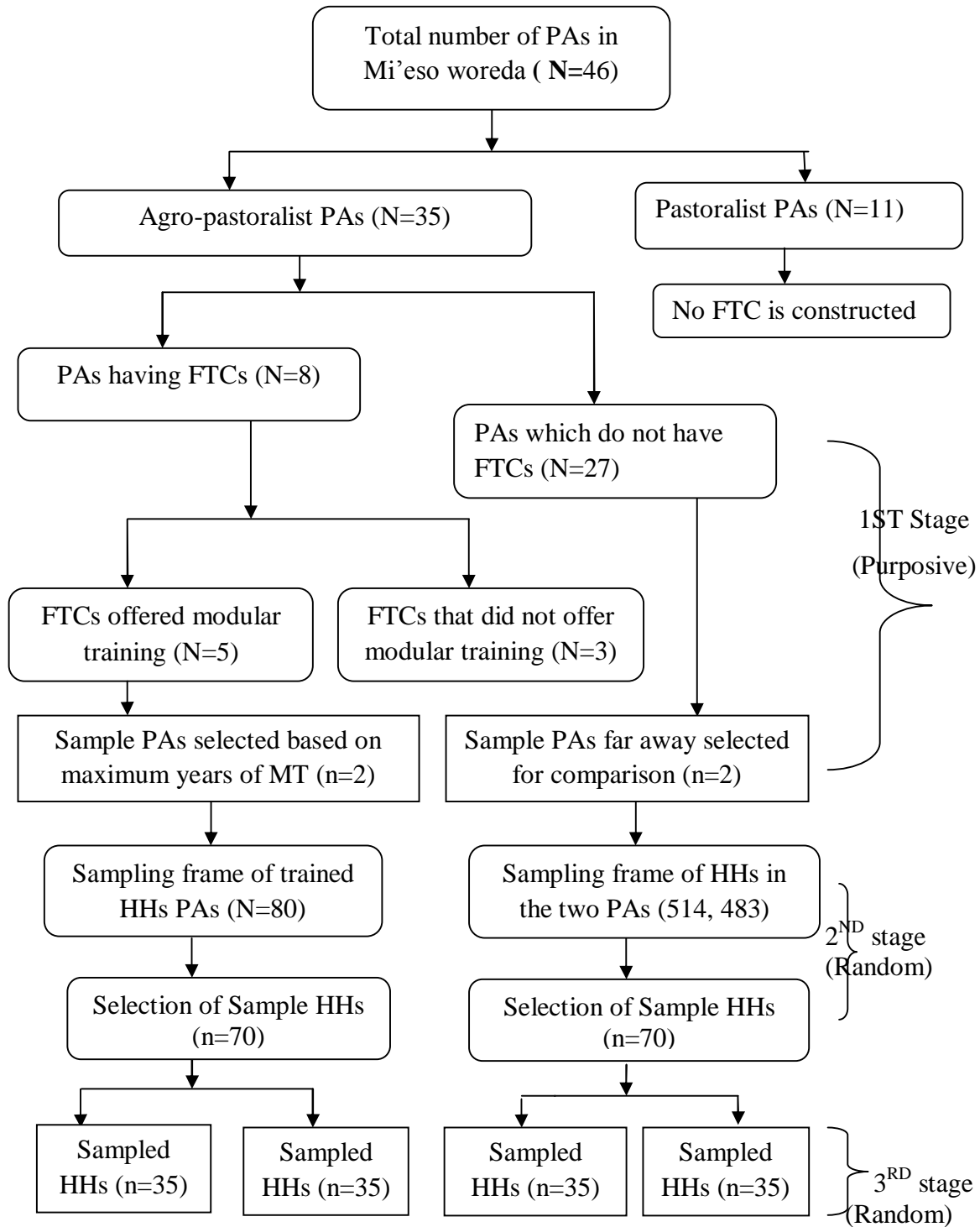


Figure 4 Diagrammatic illustration of sampling design of the study

3.2.2. Data sources and methods for data collection

In order to fulfill the objectives of the study and make the data collection process more comprehensive, both quantitative and qualitative data required for the study were gathered from primary and secondary sources (see table 1). Quantitative data were collected to evaluate the effectiveness of the modular training in terms of changes in farmers' knowledge, attitude and practices for enhancing performance. Qualitative data on training needs assessment, relevance, content, duration, methodologies and criteria for trainees' selection were collected. Moreover, data on institutional, organizational management, coordination and linkage mechanisms with which FTCs are operating under their current circumstances; and data gathered on positive deviances practically being done in the woreda were also qualitative in nature.

3.2.2.1. Data sources

Both primary and secondary sources were used to gather both quantitative and qualitative data. The primary sources were sample respondents (trained and untrained sample households), key informants, non-sample households, field level development agents and woreda level officials. Secondary sources were obtained from Mi'eso WoPRD (Woreda office of Pastoral and Rural Development), CPO (Cooperatives Promotion Office), IPMS (Improving Productivity and Market Success) project Mi'eso PLW (Pilot Learning Woreda) and other sources, such as, reports, journals, research reports, government publications and books, etc.

3.2.2.2. Methods of data collection

Qualitative data were collected by using semi-structured interview schedule and checklist. The interview schedule was designed in English and translated into Afan Oromo to fit the language of local people in the study area.

Table 1 Summary of data sources and method for data collection

No.	Objectives	Required data	Data sources	Methods for data collection	Instruments for data collection
1.	To analyze the relevance of the contents of the modular training to local priorities and needs;	-TNA procedures, -relevance of content, -duration, -methodologies, -criteria for selection, -competence of trainers etc.	-sample HHs, -DAs, experts, -FTC manag't, -WoPRD, BoARD, - MoARD officials; -Reports & records.	-HH survey, -FGDs, -KII, -Secondary data analysis, -Observation.	-SSIS, -Checklists
2.	To see the effectiveness of modular training in improving farmers' knowledge, attitude and practice levels;	-knowledge, attitude and practice levels on three sample training courses;	-trained & untrained sample HHs, -training course modules, -Reports and records	-Knowledge test	Teacher-Made Test
				-Attitude test	-Five points Likert scale
				-Practice test	-Practice test items

Table (Continued)

No	Objectives	Required data	Data sources	Methods	Instrument s
3.	To explore institutional and organizational dimensions FTCs; and	-Relevant actors and their tasks presumed to work with FTCs, -Coordination and linkages mechanisms, inputs supply, credit, marketing, cooperatives, -Mandate of FTCs management, existing rules, regulations & procedures, incentive mechanisms etc.	-Sample & non-sample HHs, FGs, DAs, experts, traders, -Woreda level offices of PRD, CP, cooperatives, schools, -Research, academicians, -IPMS project, -Secondary sources (Extension System manual, proclamations, directives, circulars etc.	-RAAKS tools (Task & Linkages Matrixes), -FGDs, -KII, -Individual interviews, - Observation etc.	-Checklist.
4.	To identify the positive deviances.	-what are positive deviances, -reasons for deviance, -deviant people/person, -advantages & disadvantages; -efforts made to scale out the deviances,	- Sample and non-sample HHs, -DAs, other FTCs, -FTC-level management committee, - WoPRD, experts, researchers, -IPMS project,	-Individual interview, -FGD, -KII, -Observation.	-Interview schedule, -Checklist, -

The interview schedule and checklist developed ahead was suitably modified and refined based on feedback from pre-testing made on nine non-sample respondents (five non-trained, and four trained) conducted by the researcher and nine trained enumerators selected from development agents of the woreda. The items in both interview schedule and checklist were carefully selected based on the review of literature and discussions with farmers and experts in the woreda and academicians. Quantitative data were collected by using formal survey. For this purpose, a semi-structured interview schedule was used to serve empirical measurement of the effectiveness of the modular training in terms of changes in farmers' knowledge, attitude and practice patterns. Focused groups interview, Key informants interview, and observation were employed to collect qualitative data guided by checklist.

Rapid Appraisal of Agricultural Knowledge Systems (RAAKS) tools were used to collect data on coordination and linkage mechanisms existing between and among relevant actors that are assumed to work with FTCs, namely, farmers, extension organization, research agencies, NGOs, cooperatives, woreda offices of education, cooperatives promotion and the like. RAAKS interviews used a semi-structured interview schedule with a list of topics that need to be covered to fulfil the objective of study. Accordingly, actors were identified based on their level of importance and expectations of one actor from the other. Data were collected from institutions and representatives of actors familiar with the situation as well as the area. RAAKS windows and tools were modified and used to adapt the analysis to the specific issues and the situation at hand. Two windows; linkage and task matrix were used in combination to the collection and analysis of data.

Measurement of variables

The important variables investigated in the research such as, training needs assessment, content, methodology and criteria used for recruiting trainees for the modular training were measured by using carefully selected items included in the semi-structured interview schedule in addition to the checklist for qualitative data collection. In order to measure the knowledge, attitude and practice levels of farmers' systematic measurement devices were developed.

This sub-section mainly discusses the tests and techniques employed to measure the knowledge, attitude and practice levels of trained and untrained sample households in order to see the differences. In the study area, modular training was offered in sixteen courses/ topics/ based on the curriculum guidelines developed for each training topic. For this study, three training topics were selected based on their immediate relevancy with the farming systems of the area, and farmers' needs of the training topics, which were revealed during preliminary exploratory study of the area. These courses were, (i) Improved Beef Cattle Production and Management (IBCPM), (ii) Improved Dairy Cattle Production and Management (IDCPM), and (iii) Soil and Water Conservation (SWC).

Accordingly, it was designed to select three training topics to measure the knowledge, attitude and practice levels to see the difference between trained and untrained sample respondents. Based on course guidelines and course modules, items or statements were constructed. Items' selection for the three courses was made with large number initially, and refined to twelve for each course following pre-testing and modifications. Thus, the items (questions/statements) covered all aspects of knowledge, attitude and practice in the three courses. The answers were made to have specificity to avoid any ambiguity in scoring.

Measurement of knowledge

A "Teacher-Made Test" was used to measure the knowledge of both trained and untrained sample respondents. Each knowledge test in each course contained twelve items. The items in the knowledge test covered questions of all aspects of the training content selected, such as, facts (memorable factual knowledge on subjects related to topics) , concepts (basic concepts on each topic), procedures (step by step operating techniques/formula to solve problems), and principles (principles behind operations), etc. (Appendix1). Twelve questions each with a total obtainable score of 21 for IBCPM and IDCPM each; whereas, twelve questions with a total obtainable score of 24 was used for SWC course. The difference between the number of items/questions/ and the maximum expected score is due to the fact that the knowledge test questions were having a "fill in the blank spaces" type of questions that have more than one answer.

The respondents were asked to the questions and the answers were recorded. The total score obtained by each sample respondent from each test of knowledge in the three courses were added together to evaluate the knowledge difference between trained and untrained respondents. The sample respondents of the two groups (trained and untrained) were further categorized into three groups each, based on the total score each individual obtained in knowledge tests of the three courses. Since the score range of knowledge test in the three topics was from 0-66, respondents were categorized with equal ranges. Thus, score of 0-21 as “low”, 22-44 “medium” and score of 45-66 “high” categories.

Measurement of attitude

The attitude statements were constructed based on literature review and discussions with experts. The statements were edited and screened using the guidelines for attitude scale construction (Edwards, 1967). To establish content validity of the scale, the items were subjected to relevancy rating by a panel of fifteen experts consisting of University academicians as well as woreda level experts. They were requested to rate each item on five point continuum from highly relevant up to irrelevant, with scores of 4-0. The obtained total score for each item was calculated and relevancy coefficient (RC) values were calculated using the formula:

$$RC = \frac{\text{Obtained score}}{\text{Potential score}}$$

The items with RC of 0.75 and above were included in the scale. Likert technique of Summated Rating procedure was followed with twelve items for each of the three training course to measure the attitude of sample respondents. Relevant items reflecting both positive and negative affects were used on five point continuums. The attitude of both trained and untrained respondents was measured by adding together the total scores each sample respondent obtained from attitude tests of three courses on the scale, by attributing 5 for “strongly agree”, 4 for “agree”, 3 for “undecided” or “no idea”, 2 for “disagree” and 1 for “strongly disagree” for positive affect (favorable) items and reversed coding was used for scoring negative affect (unfavorable) items.

The sample respondents in each category (trained and untrained) were further categorized into three groups based on the total attitude scale each individual obtained in three topics. Since the score range in attitude scale of the three courses was 36-180, the respondents were categorized with equal ranges, as score of 36-83 “low”, 84-132 “medium” and score of 133-180 as “high” category for final analysis.

Measurement of practice

In order to measure the practice level of trained and untrained farmers in the three training courses, a practice test was administered consisting of twelve relevant items. Item selection was made using similar procedure as indicated above. The scoring pattern was 1 for “the correct” answer or “yes” and 0 for “the wrong” one or “no”. The respondents were asked the questions whether or not properly perform the items (questions) and to explain the steps and procedures to be followed during implementation. The answers were recorded, evaluated and the total score each individual obtained in practice tests in the three training topics was added together and calculated. Since the score range in the practice tests of the three courses was 0-36, the respondents were categorized into three groups based on the score they obtained. Accordingly, score of 0-11 “low”, from 12-24 “medium” and from 25-36 as “high” category, for final statistical analyses.

3.2.3. Data analysis methods

To process data collected through different statistical techniques, a computer software package of SPSS (Statistical Package for Social Sciences) Version 16.0 was used. Qualitative data collected on TNA, content, duration, methodology and criteria for trainees’ selection were analyzed by coding, interpreting, framing the concepts and verification by deploying descriptive statistics, such as, frequency, means, standard deviation, and chi-square and t- tests (see table 2).

Table 2 Summary of methods of data analysis

No	Objectives	Methods used for data analysis
1.	To analyze TNA procedures and relevance of the contents to local priorities and needs;	<p>-Computer software package (SPSS –Version 16.0) was used for analysis of qualitative data after coding, interpreting, framing the concepts towards thematic areas, and</p> <p>-verification by employing descriptive statistic, such as, frequency, percentages and chi-square to test significance among responses of sample respondents,</p>
2.	To see the effectiveness of modular training in improving farmers’ knowledge, attitude and practice levels;	<p>-Quantitative data on knowledge, attitude and practice levels were analyzed by using cross-tabulation, rating, frequency, percentage and t- test for test of significance differences between mean scores of trained and untrained sample HHs.</p>
3.	To explore institutional and organizational dimensions and existing linkage mechanisms with which FTCs are functioning;	<p>-RAAKS Windows-Task matrix and Linkages matrixes,</p> <p>-Discussions and synopsis methods with representatives of relevant institutions,</p> <p>- Secondary data analysis (reports & records) and interpretation of opinions, concepts narrations, thematic transcriptions etc.</p>
4.	To identify the positive deviances.	<p>-FGDs, comparison between concepts or opinions, FTCs, identifying uncommon behaviours of individuals, effective functions and better solutions made to solve problems.</p>

Chi-square test was used to explain that, among the participants of training there was significance difference in opinions including that, the majorities opinions substantiate to be considered and measures are to be recommended based on the inference. To compare significance differences between the mean scores of trained and untrained sample respondents' test results of knowledge, attitude and practice levels t-test was used.

The analysis was started at the field level while collecting data, during focused group discussions, informal discussions and observations. The responses of sample respondents on training needs, content, duration, training methodologies, criteria for trainees' recruitment and demographic characteristics of trained and untrained respondents were analyzed based on the results obtained from the data deploying descriptive statistics. Quantitative data collected on knowledge, attitude and practice patterns of trained and non-trained sample respondents were analyzed by using cross-tabulation, rating and test of significance and the results were interpreted accordingly. Qualitative data collected on institutional, organizational management aspects of FTCs and positive deviances were analyzed based on thematic transcriptions and narrations.

Rapid (or relaxed) appraisal of agricultural knowledge systems (RAAKS) tools were used to analyse data collected on coordination and linkage mechanisms existing between and among the relevant actors/institutions that are supposed to work for the effective functioning of FTCs at the grassroots level. In this study, the main reasons behind the use of these tools were: there is lack of active participation of rural households in modular training; and lack of coordination between research, extension, farmers and other relevant institutions which are assumed to work with FTCs at grassroots level. Data collected on the coordination and linkage mechanisms existing between and among actors were analysed at two levels, FTCs at the grassroots level and at woreda level through process of discussions and synopsis method. RAAKS windows and tools were modified and used to adapt of analysis collected data.

The linkage and task matrix were used in combination. Attempt was made to look for ways to compare, combine and contrast the information gathered at various levels, in order to see how the system is connected and functioning at FTCs level, and the linkages and coordination among the actors at FTCs and woreda level. The extension systems' manual (MoARD, 2007) was managed to adapt the roles and responsibilities of each actor in order to guide an in-depth interview and discussions to reduce possibilities of unnecessary dialogue with stakeholders and to see the deviations. Finally, the results of the analysis were interpreted and presented accordingly.

4. RESULTS AND DISCUSSION

The objective of this chapter is to present the results and discussion of the study on effectiveness of modular training at Farmers' Training Centers. The chapter begins with describing the demographic characteristics of sample respondents. It gives emphasis on training needs assessment, content development, and duration, methodologies determination and criteria for trainees' selection. Women participation in the modular training offered in the study area is also dealt in this section.

The study analyses effectiveness of modular training in terms of improvements in knowledge, attitude and practice levels by comparing between trained and untrained sample households. This chapter also discusses about institutional, organizational dimensions of FTCs, coordination and linkage mechanisms currently existing between and among the relevant actors expected to work with FTCs at grassroots level, and the positive deviances accomplished in FTCs in Mi'eso woreda. Finally, the section summarizes major challenges and opportunities exist in the implementation of modular training based on the findings of this study.

4.1. Demographic Features of Sample Respondents

The demographic characteristics of trained and untrained sample respondents in this study include, sex distribution, age category, education status family size and location of trained households from FTCs. The sex distribution of sample respondents showed 83% of males and 17.1% females, and 94.3% of males and 5.7% females for trained and untrained sample households respectively. The age composition indicated 64.3% of trained and 71.4% of untrained sample households found in the age category of 20-35. Similarly, 35.7% of trained and 27.9% of untrained sample HHs categorized in 36-50. None of sample HHs is categorized in 51-65 (see appendix table 1). The family size of sample respondents indicated, 55.7% of trained and 74.3% of untrained sample respondents have from 1-4 members and the rest have five and above members

The educational level showed that, 70% of trained and 68.3% untrained sample HHs are illiterate; 13% of trained and 17% of untrained sample HHs are literate, 8.6% of trained and 3% of untrained sample HHs are from grade 1-4 and 1.4% of trained and 5.7% of untrained sample HHs are grade 5 and above. The location of trained sample HHs indicated 34.3% less than 1km, 44.3% from 1-3km and 21.4% should travel 4km and above to reach nearest FTC.

4.2. Design and Implementation of Modular Training

4.2.1. Training needs assessment

Training need can be described as a need to achieve a set of specific skills, knowledge, and attitudes, which are needed by individuals in a given organization or occupational category in order to perform a particular job or task more efficiently. Training Need Assessment (TNA) is the primary step in the training cycle involving a systematic appraisal of type, depth, and scope of problems as evidenced by available information on environment and trainee characteristics. In this study, data collected on TNA procedures were analyzed by using frequency, percentage and chi-square test. The information obtained from the analysis is presented in Table 3 as follows.

Table 3 .Trained farmers’ responses on training needs assessment

No	Items	Freq.	%	Chi-square-value	p-value
1.	Have you been consulted on need for training?			2.8*	0.094
	a)Yes	28	40		
	b)No	42	60		
2.	Have you been consulted on need for training on knowledge?			18.5***	0.000
	a)Yes	17	24.3		
	b)No	53	75.7		

Table (Continued)

No.	Item	Freq.	%	Chi-sq.	p-value
3.	Have you been consulted on interest to receive training?			32.9***	(0.000)
	a)Yes	11	15.7		
	b)No	59	84.3		
4.	Have you been consulted on need for skill training?			35.7***	(0.000)
	a)Yes	10	14.5		
	b)No	60	85.5		

Source: Own survey output, 2009.

*, *** Significant at $p < 0.1$, $p < 0.01$

The study showed that, from the total trained sample respondents, 60% replied that they were not consulted for training needs before the training. The frequency of trained respondents who perceived that there was consultation for needs before the training was 40%. There is significant difference ($p < 0.1$) between the responses. On the other hand, the proportion of trained sample households who were not consulted for needs on training for knowledge was 75.7%, significant at $p < 0.01$. The percentage frequencies of trained sample respondents suggested there was no consultation for interest to receive training was 84.3% which is significant at $p < 0.01$. The proportion of trained sample respondents opined there was no consultation for need on skill training was 85.3%, significant at $p < 0.01$.

It was also apparent during discussions with DAs that, for those trained sample households who suggested as though consultations were made before training were conceived as discussions made with households to choose training topics which they are interested in from the menu before the training was commenced. However, agreement was reached during focused groups discussions with trained households, field level development agents, woreda level management and experts that, a systematic training needs assessment was not carried out in the area, as the analysis of this study revealed.

Since TNA procedure is often conducted on sampling basis, by taking into account the probability that, these groups of households might be involved in the assessment process, key informants interview and discussions were made with Federal and Regional (MoARD) officials on needs assessment procedures of Modular Training, the responses obtained were found to be similar and the results are summarized in Box1 below.

Overall, as can be seen from the box below, the modular training programme was designed based on a given marketable crop or livestock commodity with comparative advantages in specific agro-ecological zones of our country. The rural development strategy divides the country into three main agro-ecological zones, which include regions with adequate rainfall, moisture stress areas, and pastoral areas. For instance, major interventions in pastoral and agro-pastoral areas(Mi'eso), include improving livestock quality, expansion of animal health services, water points, feed production and improvement of breeds and development of market infrastructure (MoARD, 2007).

Accordingly, the training curriculum designed and developed based on training needs of producers (based on the assessment results of pilot studies) and market demand of products in broad training areas to widen the range of choices for farmers. Based on these broader areas, training contents are designed on production, management and marketing aspects of various crops and livestock commodities. For instance, training contents provided for Mi;eso woreda included similar production methods and techniques in pastoral and agro-pastoral areas of Ogaden, Borena, Arsi, Bale and similar pastoral areas of Harerghe (West and East Harerghe zones).

Furthermore, the famous fattening techniques of Harerghe farmers, irrigation and water harvesting techniques of pastoralists and agro-pastoralists were treated in the training contents. Thus, training needs assessment was not carried out in the study area. The assumption is farmers can make appropriate choices of training contents and topics that have relevancy and harmony with their farming systems. In this study it was revealed that, farmers didn't face problems with the selection of appropriate training topics from the menu offered. However, this doesn't mean that TNA is not needed at all.

Box 3: Summary of results of key informants interview and discussion on TNA

1. TNA process helps determine the priority of changes in knowledge, skill, attitude and behaviour that will provide the greatest impact on achieving individual goals of farmers.
2. Conducting TNA on massive bases is an exhaustive, time - consuming, and expensive process that is unaffordable to undertake all over the nation.
3. It was designed instead, to conduct TNA in such a way that, all agro-ecological zones of our country can be represented.
4. Training materials were designed and developed based on the results of assessments conducted on type, depth, and scope of problems and needs, area and diversified characteristics of farmers, i.e., education, age, experiences, etc.
5. A series of trainings and workshops were held with regional bureaus, ATVET officials and improvements were made to the mother curriculum document under the leadership of MoARD and Ethiopian Curriculum Development Institute (ECDI).
6. Accordingly, Regional Bureaus have taken their responsibilities of translation to the local languages, duplication of the curriculum guidelines and courses materials, and distribution to FTCs. Monitoring and evaluation of the programme is the joint-responsibility of Federal MoARD and regional bureaus.
7. Modifications, refinement and enrichment to the contents of the training are based on the feed-backing systems established from the grassroots to the ministerial level. The current report reveals the programme progress is promising.

Source: MoARD & OBoARD (2009).

However, Stephen (2000) emphasized that, an effective training effort involves assessment of training needs of adults compared to children and teens. Adults have special needs and requirements as learners and their needs constantly change. Thus, it needs a constant identification of participants' needs and priorities. This was not done in the study area. This was also in line with the findings of Kefyalew (2006), indicated that, training are offered for farmers in most of the cases without undertaking a systematic needs assessment.

4.2.2. Content of the modular training

In this study, trained sample households were asked to disclose their opinions on the content of modular training offered in the study area. Table 4 shows the results of analysis.

Table 4 Trained farmers' responses on the contents of the modular training

					(No=70)	
No.	Item	Freq.	%	Chi-sq- value	p-value	
1.	Were the contents of the training relevant to your need?			44.8****	0.000	
	a) No	7	10			
	b) Yes	63	90			
2.	Were the contents of the training relevant to your farm operations?			35.7****	0.000	
	a) No	10	14.3			
	b) Yes	60	85.7			
3.	Were the contents of the training harmonious with your farm operations?			51.4****	0.000	
	a) No	5	7.1			
	b) Yes	65	92.9			

Source: Own survey output, 2009,

*** Significant at $p < 0.01$

The results of the analysis on the content of the modular training offered in the study area showed in Table 4 above trainings offered in three topics were relevant and need-based as 90% of sample respondents suggested significant at $p < 0.01$ and. Similarly, 85.7% of trained respondents suggested that the contents of the training topics were relevant to trainees' circumstances and farm setting. This is consistent with the principle that, adults are relevancy-oriented; they must see a reason for learning something, as Knowles *et al.* (2005) noted. Learning has to be applicable to their work or other responsibilities to be of value to them.

This indicates, the theories, concepts and examples of the topics offered were related to the setting which they are familiar with. Quite higher number of respondents, 92.9% suggested that training contents were having harmony with current farm operation. This indicates that, agro-pastoralists in the area need improved technologies of livestock production (dairy and beef) and soil and water conservation to improve their productivity. As presented in the table above, the statistical analysis in the three items resulted in significance differences at $p < 0.01$ between suggestions of sample respondents.

On top of this, as evidenced also by DAs, woreda experts and people in the study area, the woreda often experiences erratic rainfall coupled with recurrent drought; thus, most people in the area give more emphasis for livestock production, fattening and dairying, soil and water conservation measures to reduce the risks associated with drought. Therefore, these technologies are highly demanded by agro-pastoralists in the study area. As Malkon (1989), noted training contents have to be related to the setting familiar to participants. This need can be fulfilled by letting participants choose projects that reflect their own interests. The findings of this study revealed that, farmers can make appropriate choices of training contents and topics that have relevancy and harmony with their farming systems, even though, sometimes procedural needs assessment is not carried out.

However, this does not mean that a systematic and deliberate TNA should be compromised. The main reason to conduct a needs assessment is to be as sure as possible that the content of the training activity, the methods, and the level at which we teach the subject will be the most appropriate and relevant to minimize the chances of having to make major changes as more information becomes available (FAO, 1991).

4.2.3. Duration of modular training

The main aspects of duration of related to the modular training include, the length of time planned for the training, the actual duration taken to cover the training courses selected, the convenience of the selected time in relation to the trainees and the sufficiency of the time taken to offer the training. Data on duration were analyzed and the results are presented in Table 5 below.

Table 5. Trained farmers' responses on the duration of modular training (N=70)

No.	Item	Freq.	%	Chi-sq.	p-value
1.	What was the length of time taken to cover training topics selected?			58.5***	0.000
	a) Three months	3	4.2		
	b) Six months	67	95.8		
2.	Was the length of time allocated for training topics offered adequate?			11.2**	0.010
	a) It was adequate	21	30		
	b) It was not adequate	49	70		
3.	Was the time taken to offer training topics selected sufficient?			11.2**	0.010
	a) It was sufficient	21	30		
	b) It was not sufficient	49	70		
4.	Was the time (season) selected for the training convenient for you?			25.2***	0.000
	a) It was convenient	56	80		
	b) It was not convenient	14	20		

Source: Own survey output, 2009

, * significant at $p < 0.05$, $p < 0.01$

As shown in Table 5 above, quite significant number of trained sample households (95.8%) replied that, the duration of modular training offered in the FTCs was six months to cover the selected topics with two rounds. This is consistent with the length of time planned for the training as indicated on the guidelines, i.e., 300 hours or about six months. However, with regard to the adequacy of duration of the training, 70% of respondents significant at $p < 0.05$ replied that, the time period allotted to offer the training was not adequate.

Since, the duration of the training has a major effect on training effectiveness, it was attempted to hold FGDs and informal interview with DAs, experts and trained sample households on issues related to duration of the modular training. Accordingly, participants of discussions and interviews pointed out that, there is a need to receive training on various topics and technologies; this is because farmers often use a number of practices and techniques as coping strategy to minimize risks resulted from recurrent drought. Therefore, the time allocated for certain training topics becomes inadequate to cover a number of training areas based on farmers needs.

In this study, respondents were asked to suggest on the sufficiency of training time, for this 70% of respondents replied the time taken to offer the training selected was not sufficient. Three months are not sufficient to cover the comprehensive training topics which are highly demanded by the trainees. Trainers also opined that, they often encounter difficulty in offering training for a diverse audience with mixed age and educational background within the allotted duration. With regard to the convenience of training time for participants, 80% of sample trained households significant at $p < 0.01$ responded that, the training time was convenient to receive the training because the months selected for the training were of off-season.

The timing of appropriate season for training will ease the implementation of the programme. Farmers often prefer to participate in training during slack periods. In the study area trainings were offered in off seasons of the year (i.e., December through to mid March), with the result that they responded the time of the training was convenient.

Other issues related to duration of the training discussed with trained sample households were, whether they have been consulted for fixing the duration of the training before, and the appropriate duration and time they prefer for the future training programmes. The results are summarized in Table 6 as follows.

Table 6 Trained farmers' responses on preferred duration for modular training (N=70)

No.	Item	Freq.	%	Chi-sq.	p-value
1.	Have been consulted for fixing duration of the training before the training?			48.0***	0.000
	a)No	64	91.4		
	b) Yes	6	8.6		
2.	What is the preferred duration for the future programs?			35.7***	0.000
	a)Three to six months	60	85.7		
	b)Three months only	10	14.3		
3.	What is the preferred style of training for the future programmes?			48.0***	0.000
	a)Continuous	6	8.6		
	b)With interval	64	91.4		

Source: Own survey output, 2009

*** Significance at $p < 0.01$

As Table 6 clearly depicted, 91.4% of sample households significant at $p < 0.01$ responded that, they were not consulted for fixing training duration. However, they suggested the appropriate duration of training preferred for the future. For this, 85.7% of trained farmers responded (significant at $p < 0.01$) the duration to be from three to six months based on the training topics. Furthermore, the preferred style of training appropriate was also suggested by sample respondents. For this, 91.4% replied that the training content should be covered in relation to farm activity with intervals by following farm activities which might help farmers to implement the training into practice.

It was also suggested during FGD held with sample and non-sample respondents that training with intervals is preferred to continuous style. The training has to be offered at different seasons of the year and the contents of the training need to follow the working calendar and the type of operation on which the farmers are engaged on. For instance in the study area, as evidenced by DAs and participants of FGDs held in each PA, as moisture unreliability is a common phenomena, households provide emphasis for livestock production and cropping of staples as sedentary farming.

Both livestock and crop production systems are entirely dependent upon rainfall that comes out for a few days in two rainy seasons, which run from mid March to mid April and from mid June to September. This indicates that rural households will be engaged in farm operations not less than eight months including harvesting. Thus, as trained sample households indicated above, farmers can conveniently participate in trainings and show interest during the months of December, January, and February and sometimes in March also when there is no rainfall.

However, trained and untrained sample households revealed they need practical training and technical support from experts and DAs on improved technologies while performing their farm operations in the field and at home during production seasons. This is in line with Phil (2007) as cited in Ranjan (2008) noted that ,the aim of farmers training is not just to impart knowledge and skills in short intensive training courses, but to involve rural people in the development activities through a continuous process of learning week after week.

4.2.4. Methodology of the modular training

A training method is a strategy or tactic that a trainer uses to deliver the content so that the trainees achieve the objective. Selecting an appropriate training method is perhaps the most important step in training activity once the training contents are identified. Trained farmers responses to the methodology that was followed by trainers at FTCs were also evaluated in this study. The data collected on methodologies were analysed by using descriptive statistics of frequency and percentages and chi-square test. The output of the analysis is summarized in Table 7 as follows.

Table 7. Trained farmers' responses on methodology of modular training

(N=70)

No.	Item	Freq.	%	χ^2	p-value
1.	Which training methods were used during the training?			117.5****	0.000
	a) Class room lecture	45	64.4		
	b) Field practice	9	12.8		
	c) Demonstration and field visit	1	1.4		
	d) Peer group learning	4	5.7		
	e) a & b	7	10		
	f) All	4	5.7		
2.	What was the proportion of theory and practice?			47.1****	0.000
	a) Too much theoretical session	49	70		
	b) Too much practical session	18	25.7		
	c) Both were proportional	-	-		
	d) Proportions were not considered	3	4.3		
3.	What is the preferred training method?			14.6****	0.000
	a) Class room lecture	10	14.3		
	b) Field practice	20	28.6		
	c) Demonstration and field visit	20	28.6		
	d) Peer group learning	8	11.4		
	e) All	12	17.1		
	a) Class room lecture	10	14.3		
	b) Field practice	20	28.6		
4.	What was the level of participation of trainees during the training			30.2****	0.000
	a) Low	12	17.1		
	b) High	58	82.9		

Table (Continued)

No.	Item	Freq.	%	Chi-sq- value	p-value
5.	Level of experience sharing			48.0***	0.000
	a)Low	6	8.6		
	b)High	64	91.4		
6.	Level of use of indigenous knowledge			51.4***	0.000
	a)Low	5	7.1		
	b) High	65	92.9		

Source: Own survey output, 2009

*** Significance at $p < 0.01$

As shown in Table 7 above, training methods adopted during the training session as respondents mentioned were class room lecture, field practice, demonstration and field visit and peer group learning. Significant frequencies of respondents 64.4% (at $p < 0.01$) indicated class room lecture was used more than other methods; 12.8% of trained respondents also replied that field practice was used, following class room lecture. In the case of peer group learning very few respondents seemed to prefer this methodology. It was also suggested that, classroom lecture and field visit together were used as evidenced by 10% of the trained respondents.

Different views were observed during discussions and informal interview with woreda level experts, DAs and trained households on training methodologies employed. Trained respondents perceived lecturing, methods and results demonstration techniques shown in classroom either through video cassettes or by trainers alone, they all considered as class room lectures. This is because, in trainees' opinion, unless they manually exercise and perform these techniques by themselves, they consider as classroom lecture rather than practical session, since it starts and ends up in the classroom without their involvement.

The other reason suggested was, since the majority of participants were unable to write and take lecture notes, they only believe in training that if they are demonstrated with practical learning and be able to perform by their own. Respondents also suggested that field practice in FTC compound and outside areas is the most preferred method. On the other hand, demonstration and field visits on model farmers' fields outside FTC are also appreciated.

Over all, trained respondents' views and suggestions underscored that practical training conducted in FTCs in all topics has resulted in visible improvements in performance of trained respondents productivity and income. As can be seen in Table 7 above, higher proportion of trained respondents 70%, significant at $p < 0.01$ perceived, the theoretical part of the training was too much; whereas, 25.7% responded the proportion of practical session was much. DAs also suggested that, as FTCs are not equipped with training facilities and materials, the proportion of theoretical sessions becomes too much, yet practical training is provided with the support provided by IPMS project to the extent possible.

However, as Knowles (2005), suggested adults are practical, focusing on the aspects of a lesson most useful to them in their work. Respondents were also asked about the methodology they preferred for the days coming, practical demonstration and field visit were equally important as responded by 28.6% of sample households ($p < 0.01$). Class room lecture and peer group learning were the least preferred methodologies. As indicated in the previous paragraphs, the reason behind for least preference of class room lecture was due the fact that most participants were unable to take lecture notes and read materials.

Thus, they most prefer to learn practically in the field than in the class room. Peer group learning is also a better method to scale out the best experiences of model farmers on groups bases. Table 7 also portrayed that, the proportion of trained sample respondents who suggested on the level of their own participation during training sessions, for this, 82.9% responded that the level of participation was high, significant at $p < 0.01$. This demonstrates the training topics and contents were interesting and had strong relationship with trainees' current farm operations.

If adult training is experience-based, their level of participation would become higher. This is consistent with Stephen (1991), noted that an effective training effort involves understanding how adults learn best. This study also revealed that, the extent of experience-sharing among participants during the training was high as 91.4% of trained respondents indicated significant at 0.01. This indicates that contents and methods of the modular training were found participatory and enabled trainees to share their experience with other participants. This is consistent with Holton (1996), experiential learning approaches have the dual benefit of appealing to the adult learners experience base as well as increasing the likelihood of performance change after training.

Data gathered on the extent of use of indigenous knowledge during the modular training in the study area, results shown 92.9% of trained respondents (significant at $p < 0.01$), indicated local indigenous knowledge was incorporated and dealt with the topics of training and enhanced the knowledge trainees have on different topics offered. This suggests that, the need for more consideration of the local knowledge of farmers in the training content and methodology will help to improve training effectiveness and enhance the local adaptability of technologies and appropriate refinement would be possible only if due consideration is given to indigenous knowledge of participants.

4.2.5. Frequency of use of training aids

Teaching materials are teaching aids used during training to facilitate effective communication and learning. Table 8 below presents frequency of use of training materials during training. As can be seen from the table below, 91.4% of trained sample respondents suggested that, they have frequently used handouts and books to aid the training. Video and films have been used seldom as 81.4% of respondents suggested. The findings also showed that, OHP & LCD have never been used throughout the training session, and models of UMMB, seeds, fertilizers and others have been used rarely as 91.4% of sample respondents replied. On the other hand, field equipments of SWC and others have been frequently used during the training.

Table 8 Frequency of use of training materials

(N=70)

No	Aids	Frequencies							
		Never		Rarely		Often		Always	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
1.	Handouts & books	-	-	-	-	64	91.4	-	-
2.	Video & films	-	-	57	81.4	-	-	-	-
3.	OHP & LCD	70	100	-	-	-	-	-	-
4.	Models	-	-	64	91.4	-	-	-	-
5.	Field equipments	-	-	-	-	65	92.4	-	-
6.	Demonstration tools	-	-	66	94.3	-	-	-	-
7.	Board and chocks	-	-	-	-	-	-	62	88.6
8.	Posters	-	-	65	92.9	-	-	-	-

Source: Own survey, 2009.

Overall, the training offered was dominated by classroom lecturing, handouts of the trainers and boards and chocks. Moreover, trainees haven't been given any reference material or handout after the training for further reference during farming practice.

4.2.6. Criteria for trainees' selection

In this study, criteria for selection of participants for the modular training were assessed. The trained participants' perceptions on trainees' selection criteria before implementation were analyzed and the results are displayed in Table 9 as follows.

Table 9. Trained farmers' responses on trainees' selection criteria

(N=70)

No.	Item	Freq.	%	Chi-sq.	p-value
1.	Who has selected you for the training?			68.7***	0.000
	a)Development agent	56	80		
	b)Farmers' groups	8	11.4		
	c)WoPRD	6	8.6		
2.	What do you think is the perceived criteria for trainees' selection?			7.0**	0.029
	a)Literacy	33	47.1		
	b)Being model	22	31.4		
	c)Being PA cabinet member	15	12.4		
3.	What was the nature of farming experience of participants?			38.6	0.000
	a)Heterogeneous	61	87.1		
	b)Similar	9	12.9		
4.	What was the level of women participants in the training?				
	a)Low	70	100	-	-
	b) High	-	-	-	-
5.	What do you think is the reason (s) for low level of women's participation?			56.6***	0.000
	a)Cultural influence				
	b)Fear of male participants				
	c)Occupied by household work				

Source: Own survey output, 2009.

, * Significant at $p < 0.05$, $p < 0.01$

As shown in Table 9 above, higher number of 80% of trained respondents significant at $p < 0.01$ indicated they had been selected by DAs and 11.4% perceived as selected by farmer groups. Only 8.6% of trained respondents perceived they had been selected by WoPRD being model farmers. It was evident during group discussion with FTC management committee, trainees selection criteria employed at FTC level entail literacy, being model farmer who is interested in experience-sharing for colleagues and influential to persuade others to pursue his/her way of improving own life.

Nevertheless, farmers' personal motivation for achievement is still crucial ((Dunn and Griggs, 1988). On the other hand, trained respondents suggested the preferred criteria for trainees' selection. For this, 47.1% of respondents suggested literacy, significant at $p < 0.05$; 31.4% preferred model farmer to be selection criteria. It was found that there is agreement between DAs, FTC management and trained respondents suggestions on trainees' selection criteria. This indicated that literacy is a crucial factor for participation in modular training and literacy programme which currently being implemented in FTCs in the study area needs to be enhanced.

Being a model farmer is also important criteria for selection, because there are intelligent people who have the ability to learn concepts, facts and skills better than other people. Model farmers are also known for sharing own experiences for colleagues so that others can learn from them. The nature of farming experience of trained respondents was assessed, and it was found heterogeneous as responded by 87.1% of sample households, significant at $p < 0.01$. This could show that the participants may have different degrees of farming attitude, experience and indigenous knowledge. This can create the opportunity to share their indigenous experience and knowledge among the participants during trainings if participatory learning is facilitated.

The indigenous knowledge of participants may become the base for research and development in that; indigenous knowledge is closely associated with the environment in which agro-pastoralists are living for centuries. This helps development of location-specific technologies that can adapt to the area by reducing mistakes and costly resources. Obviously, differences in participants' farming experience have their own impact on the effectiveness of training.

Assessment of women's participation in modular training was also carried out in this study. As can be seen from the table above, the number of women participants in the modular training was low as suggested by sample respondents. They were asked to suggest probable reasons behind low level of women participation in the training. As suggested by 75.7% of trained sample respondents ($p < 0.01$), the reason was cultural influence in a sense that preventive cultural outlooks and tradition that relegates women only to household work might be responsible; 12.8% of trained respondents suggested to be fear of male domination during training sessions. Only 11.5% opined that the reason might be load of house hold work.

However, it was evident during informal discussions with women that, they are responsible for livestock management in the household. Dairying, milking, feeding and marketing of live animals and milk and milk products are all their duties. This was similar to the reports from the Borana plateau, that milk product marketing and processing in the household are under the control of women (Coppock, 1994). Kedija (2007), also noted that, women in the household are responsible for cow milking, feeding and milk marketing.

It was also stated in the extension system document (MoARD, 2007), equal emphasis will be given to women to build capacities to enhance their participation and empowerment in the socio-economic systems. However, the actual situation on the ground does not prove the claim. There no is visible attempt designed to support special needs and problems of rural women in the study area. DAs also opined that outlooks, practices and even proverbs are some of impediment for women participation in the modular training.

4.2.7. Competence of trainers

A trainer (resource person) is one who facilitates active learning in adult training in which participants will get the general picture about what topics to cover, and they reflect their interests and help achieve their goals. In this study, trained sample respondents were asked to suggest on competency of trainers, in this case, DAs. The results are summarized in Table 10 as follows.

Table 10 Trained farmers' responses on competency of trainers

(N=70)

No.	Item	Freq.	%	χ^2	p-value
1.	How do you evaluate the competency of trainers?			54.0***	0.000
	a)Not competent	4	5.7		
	b)Competent	66	94.3		
2.	How do you evaluate the communication skill of trainers?			48.0***	
	a)Poor	-	-		
	b)Average	6	8.6		
	c)Very good	64	91.4		
3.	How do you evaluate facilitation skill of trainers?			35.7***	0.000
	a)Poor	-	-		
	b)Average	10	14.3		
	c)Very good	60	85.7		
4.	How do you evaluate the familiarity of trainers to the area and farmers?			44.8***	0.000
	a)All are familiar	63	90		
	b)Only some are familiar	7	10		
5.	How do you evaluate the approach of trainers			48.0***	0.000
	a)More friendly	64	91.4		
	b)Friendly	6	8.6		

Source: Own survey output, 2009.

*** Significant at $p < 0.01$

As can be seen in Table 10 above, 94.3% of trained sample households at $p < 0.01$ significance level suggested that trainers were competent to train the farmers on contents of the topics of modular training. This indicates trainers have the ability to offer theories, concepts and examples of the topics to participants effectively. Similarly, with regard to the communication skill of trainers, 91.4% of the respondents ($p < 0.01$) suggested very good. This indicates, trainers were competent to convey theories and concepts of the topics clearly so that the learners can understand and grasp the knowledge to the desired level. Trained sample households also provided their opinion on the facilitation skill of the trainers.

Accordingly, 85.7% of respondents ($p < 0.01$) replied that, the facilitation skill of trainers was very good. This indicates trainers have assisted adult trainees to connect learning to their own knowledge and experience through participatory processes. On the other hand, trained sample households' response on familiarity of trainers indicated, 90% (significant at $p < 0.01$) perceived all were familiar with the local situation and trainees. A resource person is usually not seen as someone whose task is to suggest alternatives, point out contradictions, draw attention to relationships of dependence, or prompt painful, critical scrutinize of assumptions, value frameworks, or behaviours.

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, grants a substantial measure of control to learners, and places learning directly in the context of learners' own experiences (Sullivan, 1998). Trained sample respondents also suggested on the approach of trainers of the modular training. For this, 91.4% (significant at $p < 0.01$) responded that the approach of trainers' was friendlier during the training sessions. This indicates that, trainers were open to trainees' ideas, encourage participation and have good personal appearance during training sessions.

4.3. Knowledge, attitude and practice test scores

Training programmes are designed to change the knowledge, attitude and skill of participant trainers. Evaluation is a process to determine the relevance, effectiveness, and impact of activities in light of their objectives. This sub-section presents the attempts made to measure the effectiveness of modular training in the study area.

As mentioned in the methodology part of this thesis, of the total training topics offered in the last three years in the study area, three training courses were selected to measure the effectiveness of the modular training in terms of improvements in trained respondents' knowledge, attitude and practice levels for enhancing their performance. In this sub-section findings of analysis on knowledge, attitude and practice tests carried out are presented by aggregating the findings together.

4.3.1. Knowledge level of trained and untrained sample respondents

Knowledge is acquired facts and information that are available for recall and an understanding of the meaning of facts and information. Primary data collected on the knowledge of trained and untrained respondents was subjected to statistical techniques of frequency, percentage and t-test for analysis. The output of knowledge test on three training topics was added together and compared between trained and untrained respondents. Respondents were categorized into three groups based on the knowledge score each individual obtained on a knowledge scale. The results of analysis are presented in Table 11 as follows.

As can be seen from Table 11 below, the mean scores of knowledge of trained and untrained respondents were 34.77 and 14.80 respectively. This is out of the expected potential mean score of 33 with standard deviation of 7.629 for trained, and 4.21 for untrained respondents. There was a significance difference ($p < 0.01$) between the knowledge level of trained and untrained sample respondents on IBCPM, IDCPM and SWC. Minimum knowledge scores for trained and untrained groups 16 and 7, whereas, the maximum scores were 51 for the former group and 33 for the latter one.

Table 11 Knowledge level of trained and untrained sample households

Categories	Trained		Untrained		Total		t-value	p-value
	Freq.	%	Freq.	%	Freq.	%		
Low	4	5.7	62	88.6	66	47.1	20.0***	0.000
Medium	45	64.3	8	11.4	53	37.85		
High	21	30	-	-	21	15.01		
Total	70	100	70	100	140	100		
Mean	34.77		14.8					
Std. Dev.	7.629		4.21					
Minimum	16		7					
Maximum	51		33					

Source: Own survey output, 2009

*** Significance at $p < 0.01$

The findings also shown, of the total trained sample respondents, 64.3% (n=45) were categorized under middle category, whereas, only 11.4% (n=8) of untrained households were found in medium category. Moreover, only 5.7% (n=4) of trained respondents were under low category, while 88.6% (n=62) of untrained respondents found in this same class. The findings indicated farmers participated in modular training in the study area are better than untrained farmers in their level of knowledge about improved practices and information on IBCPM, IDCPM and SWC. The modular training is effective in creating the opportunity for trained households to improve their level of knowledge on the aforementioned training topics.

The training helped farmers improve their knowledge and this helps trained agro-pastoralists for better performance. The study also shown that the mean score of trained farmers is greater than the potential obtainable mean score, thus the training programme has attained its objective in terms improvements in knowledge of trainees.

4.3.2. Attitude of trained and untrained sample households

Attitude measures the degree of liking or disliking of individual towards an object, idea or practice. Primary quantitative data collected on attitude of trained and untrained respondents was subjected to descriptive statistics of frequency distribution, percentages, mean, standard deviation and t-test for analysis. Both trained and untrained sample respondents were categorized into high, medium and low groups based on attitude score each individual obtained on attitude scale. The findings of analysis are presented in Table 12 below.

Table 12 Attitude level of trained and untrained sample respondents (N=70)

Categories	Trained		Untrained		Total		t-value	p-value
	Freq.	%	Freq.	%	Freq.	%		
Low	–	–	8	11.4	8	5.71	17.2***	0.000
Medium	29	41.4	62	88.6	91	65		
High	41	58.6	-	-	41	29.3		
Total	70	100	70	100	140	100		
Mean	133.11		97.47					
Std. Dev.	8.447		15.849					
Minimum	133		54					
Maximum	150		125					

Source: - Own survey output, 2009

*** Significance at $p < 0.01$

Mean distribution of attitude scores of trained and untrained sample respondents indicated 133.76 and 97.47 respectively. This is out of potential obtainable mean score of 108 with standard deviation of 8.447 for trained, and 15.849 for untrained farmers. The minimum attitude score of trained respondents is 113, whereas, untrained respondents scored 54. Similarly the maximum score of trained respondents is 150 and untrained respondents scored 125.

There is significance difference ($p < 0.01$) between trained and untrained respondents attitude towards improved beef, dairy cattle production and soil and water conservation technologies. The results indicated, the modular training programme is effective in terms of improvements in attitude of trained farmers towards improved technologies of the mentioned topics, as the mean attitude score of trained farmers' group is greater than the expected mean score, it can be said that, the modular training programme is effective in changes in positive attitude of farmers towards improved technologies.

The findings revealed that, of the total trained respondents 58.6% ($n=41$) were categorized under high class, while, untrained farmers couldn't be categorized in the high group. On the other hand, the proportion of trained and untrained sample households categorized under medium class were 41.4% ($n=29$), and 88.6% ($n=62$) respectively. This indicates, untrained farmers also made efforts to acquire information from various sources on improved technologies of beef and dairy cattle and soil and water conservation, although they didn't get the opportunity to participate in the modular training. This also has an implication that improved technologies of beef, dairy and soil and water conservation are highly demanded by the farmers in the study area.

4.3.3. Practice levels of trained and untrained sample respondents

The transfer of skills is much more important than just the transfer of knowledge. Attained information must be put into practice in an effective and efficient manner. In other words, the knowledge acquired must be expressed in skills (Standaert and Troch, 1987). Primary quantitative data gathered on practice levels were analyzed by using descriptive statistics of frequency, percentage, mean, standard deviation and t-test for analysis. Table 13 presents the results of the analysis as under. As can be seen from the table below, the mean score distribution of trained and untrained sample respondents practice patterns was 21.41 and 12.64 respectively. This was out of the potential obtainable mean score 18. The minimum score of sample households was 13 and 3 for trained and untrained farmers respectively, whereas, 32 was the maximum score for trained and 26 for untrained ones.

Table 13 Practice levels of trained and untrained sample households

Categories	Trained		Untrained		Total		t-value	p-value
	Freq.	%	Freq.	%	Freq.	%		
Low	–	–	24	34.3	24	34.3	11.5***	0.000
Medium	51	72.9	45	64.3	96	68.6		
High	19	27.1	1	1.4	20	14.3		
Total	70	100	70	100	140	100		
Mean	21.41		12.64					
Std. Dev.	4.598		4.597					
Minimum	13		3					
Maximum	32		26					

Source: - Own survey output, 2009

*** Significance at $p < 0.01$

The t-test showed significance difference ($p < 1\%$) between practice level of trained and untrained sample households. This indicates the modular training is effective in improvements in practice level of trained sample households to enhance their performance. The findings also indicated that, 27.1% (n=19) of trained, and only 1.4% (n=1) of untrained sample households are in the higher category. However, the majority of both trained and untrained households, 72.9% (n=51) and 64.3% (n=45) are located in middle class respectively. However, none of trained respondent is found in the lower category, whereas, 34.3% (n=24) untrained farmers are categorized in this group. The results of analysis demonstrated that, the number of untrained sample respondents located in middle category is not negligible; this indicates untrained rural households in the study area made ample efforts to put improved technologies into practice, although they didn't the opportunity to modular training.

4.3.4. Registration, dropout and completion of modular training

As tried to mention in the methodology section of this thesis, the modular training was offered in six training topics. This sub-section discusses efforts and achievements made in the implementation of the modular training programme in study area. Table 14 below presents targets and achievements of the training programme from 2007-2009.

Table 14 Registration, dropout and completion of the training

No	Participants	Registration (No)			Dropout (No)	Completion(No)		
		T	A	%		T	A	%
1.	Total households	1800	356	19.7	137	1800	219	12.6
	-Male	1440	321	22.2	114	1440	207	14.4
	-Female	360	35	9.7	23	360	12	3.3

Key: T: Target A: Achievements

Source: WoPRD (2009).

As can be seen from table 14 above, of the total eight FTCs in the woreda, only five were fulfilled with basic materials and facilities and started modular training in the last three years (2007-2009). According to the guideline for implementation of modular training programme (2007), an FTC should train 120 farmers a year. Thus, five FTCs have planned to train 1800 households in three years (1440 males and 360 females). Data obtained from WoPRD (2009) indicated that, 356 farmers registered and started their training since 2007, which is 19.7% of targeted. Due to several reasons, 137 households dropped out the programme (36.4% of registered). Reasons mentioned were, lack of household labour, lack of motivation due to lack of supply of improved technologies and credit service, etc. Finally, 219 participant trainees have successfully completed the programme, which is 12.6% of targeted for three years.

However, Green certificate was not given for those trainees successfully completed their training. The reason mentioned was that, the Green certification system is not started in Ethiopia, as most of the trainees cannot fulfil the minimum requirement established for Green certification (i.e., education level of Grade 8 and above). The WOPRD have provided recognitions and certificate for the trainees in order to encourage other farmers to participate. Other reasons behind lack of participation of farmers in the modular training programme in the study area are discussed under the following sub-sections.

4.4. Institutional, Organizational Management and Linkage Mechanisms

Training is not given for simply upgrading know-how unless attached to planned task. Provision of training alone cannot bring about the required improvement. The contributions of institutional, organizational and linkages with other institutions are indispensable for the success of modular training programme. This section briefly discusses institutional, organizational management and linkage mechanisms with which FTCs are functioning under their current circumstances.

4.4.1. Institutional aspects

The usefulness of a systems approach for understanding and analyzing agricultural technology generation and dissemination is widely acknowledged (Elliott *et al.*, 1994 as cited in FAO, 1998). In his study, institutional aspects of FTCs emphasized the current state of inputs supply, credit service, product marketing and cooperatives working with FTCs at grassroots level.

4.4.1.1. Inputs supply

Farmers need inputs to increase production, but access to these is a key factor (FAO, 1998). The major inputs that farmers often use in the study area include, improved fodder crops, concentrates, improved varieties of food crops, fertilizer, breeds of dairy and goats, vaccines and pesticides etc. It was found that, the main inputs suppliers in the study area are, WoPRD, IPMS project, cooperatives and private dealers.

During FGDs and KII made with sample and non-sample farmers, DAs, and woreda experts that, despite farmers in the area have appreciations and often show their demand for improved technologies, lack of timely supply, lack of financial power to purchase inputs and high prices of inputs constrained the adoption of improved technologies. The other problem also raised during discussion was lack of supply of improved technologies compatible to agro-ecologies having unreliable moisture. For instance, early and medium maturing sorghum and maize varieties are lacking.

On the other hand, secondary data of this study found that, of the total trained sample households (N=70) of the modular training in sample FTCs only 55.7% (n=39) used improved technologies in the last twelve months. The types of improved technologies used were, improved seeds sorghum, forage, concentrates and onions. Respondents also indicated the reasons were lack of timely inputs supply, lack of credit and high market price of inputs and low price of livestock products. As respondents indicated they purchased the above mentioned inputs from private sources. Inputs supply was not undertaken by WoPRD and WoCP in 2009 production year.

In the study area, smallholder farmers produce food and forage crops under unreliable rain-fed conditions. Thus, farm operations need to be implemented at the right time in order to compete for early on-set of rainfall. This requires the necessary farm inputs must be made available at the right time and with sufficient quantities. Timely supply of improved technologies also determines the continuity of modular training in the study area. Habtemariam (2007), also reported that, there is a problem of timely delivery of the very common and traditional inputs like fertilizer and cereal seeds in many areas of the country. Regarding fertilizer and improved crop seeds, the constraint today is not that of knowledge and skills in most of the areas in the country but of input supply.

4.4.1.2. Credit service

Access to credit is one way to improve producers' access to new production technologies and increase productivity. Farmers' ability to purchase inputs is particularly important. In this study, attempt was made to see the existing credit service in the study area.

Accordingly, two credit sources were identified as formal and informal sources of credit. Formal sources include, WoPRD and WoCP, IPMS project, and cooperatives; where as, the informal sources include, local lenders, relatives/neighbours and private dealers. As this study indicated, in the last production year, the only source of credit was found the informal one to access credit for farmers. IPMS project has provided credit for six cooperatives in six PAs. IPMS project was the only formal source of credit in 2009 production year. Discussions with trained households revealed that, of the total trained sample respondents, 42% (n= 29) received credit from local lenders or traders for the purchase of seeds of food crops, onion, concentrate feed.

Trained sample house holds also complain that trainings programme at FTCs is not accompanied by inputs supply, credit and other supports such as marketing for produce from the government side. Rural credit service can help farmers in solving capital problem to buy farm oxen, modern farm inputs, entry to trade, entry to profitable none and off-farm activities, and further enhancing use of technologies etc.

4.4.1.3. Product marketing

Agricultural markets play a key role in the lives of poor people in rural areas. Rural households, however, are subjected to a number of constraints that make their participation in the market both costly and risky. In this study, the main marketing problems agro-pastoralists faced in the last production year (2009) were put by participants of FGD as, high price of food items, lack of market and low price of livestock in general, lack of credit service and poor performance of cooperatives and unions.

The other marketing problem in the area was low market price of livestock and lack of market for milk, fattened bulls and goats even from the nearer large towns of Mojo, Awash, Metehara and Chiro coupled by intermediaries which often claim benefits at the mercy of producers. Kedija (2007), also reported in her MSc Thesis project conducted in the same area that, seasonal price fluctuations and consumer interference in price setting are the major problems in milk marketing in Mi;eso worda.

4.4.1.4. Cooperatives

In this study, it was attempted to assess existing cooperatives in the study area with special emphasis on their contributions for FTCs functioning, the results of discussions and information from WoCP are summarized in Table 15 as follows.

Table 15 Membership and capacity of registered cooperatives

No	Cooperatives	Members			Capital (Birr)	Number of PAs
		Male	Female	Total		
1.	Multi-purpose (N=13)	953	18	971	102,334.34	13
2.	Saving and Credit (N=13)	668	252	920	118,144.60	13
	Total	1621	270	1891	220,448.94	-

Source: WoCP, 2009.

Table 15 showed that, there are only 13 multi-purpose cooperatives organized in the woreda with a total membership of 971, and capital of Birr 102, 334.34. Out of the total 46 PAs in the woreda multi-purpose cooperatives were organized only in thirteen PAs (28%). In other words, from the total rural households residing in the woreda only 4.4% were made to come into collective organizations. For instance, only 25 and 27 households are members of cooperatives in the two PAs of Gorbo and Tokuma FTCs capital of Birr 1,500.00 and 1,760.00, respectively. The other 13 cooperatives are working on saving and credit. They seldom work on agricultural inputs supply and credit services, rather they emphasize on social aspects of farmers.

Secondary data analysis and information obtained during discussions indicated multi-purpose cooperatives would play crucial roles in accessing improved technologies, credit and facilitation of product marketing etc as they are given the rights according to the proclamation of cooperative.

However, at present these institutions suffer from, lack of capital, skilled cooperative promoters, and marketing challenges and other supports from the government.

Moreover, the participation of women in the development of cooperatives is very low. However, women have better participation in dairying and livestock marketing. It was found that, there are no micro-finance institutions operating in the area.

It was also revealed during discussions that, as the area is drought prone, farmers often demand improved technologies adaptable to the area, yet these technologies are rarely available, as the available technologies have wider adaptation to areas with reliable moisture. Hence, rate of credit return is very low. These factors weakened cooperatives and their performance. Over all, assisting producers to organize themselves so that they can play an active role in the extension system has not been given due attention in the study area.

4.4.2. Organizational management aspects

Organizational development intervention aims to promote and assist local institutions to become more effective, viable, autonomous and legitimate to make decisions on local affairs. In this study, assessment of management aspects of FTCs focused on formal and informal institutions available for functioning of FTC- management committee at farmers' level. It was tried to see FTCs as organizations exist formally on paper, and the actual setting by which FTCs operate currently. One way to do so was to assess formally stated purposes of the centers and how members of organization (FTCs) describe these purposes.

KII and FGDs were held with FTC management, FTC management consists of PA chairman, PA manager, 3 DAs, representatives of women, youth and other two model farmers. These form PA level extension unit. Discussions with members resulted in that, FTC level management doesn't have clearly defined mandate bestowed from government to effectively authorize its mandate to carry out the perceived responsibilities at FTC level. However, at present, the FTC management in both sample PAs is trying to serve the local community to the extent possible with own initiatives.

Human resources in an organization likely to consist of any person who is in any way connected with it: management, staff, members, volunteers, constituents, donors, and other members. Obviously, members working at FTCs must have the skills, motivation, and the opportunity to make the best contribution to the organization they can. They also need to be organized and relate to each other in ways that best achieve productive outcomes. How the staff makes decisions, resolve conflicts, communicate, and conduct meetings is as important as how the work is designed, how jobs are organized in relation to each other, and how the work is allocated. However, it was evident during secondary data analysis and FGDs made with FTC management that, there is no clearly stated formal record that reveals task and performance management, salary administration, team development and conflict management or coordination system established to serve as institution local level.

At present, FTC management works with no or insufficient capacity, budget, skilled administration personnel, etc. For instance, DAs are recruited, sent to colleges for training of some years and return back, again assigned, evaluated, rewarded and salaried by WoPRD. To put it in a nut shell, they are directly accountable to WoPRD. This indicates that, DAs and other representatives of local community are working based on their own interest rather than formally devised constraints that shape their action and interaction. Thus, local people need to own their own development endeavors and control over their destiny. This helps to bring about improvement in their life and effectiveness of development programmes.

On the other hand, what an organization can achieve depends to a certain extent on the financial resources available and procedures how to manage these resources. A viable organization should have systems and guidelines in place to regularly plan or budget to meet financial needs, ensure that FTCs have on hand the necessary funds to purchase the goods and services they needs for their activities, record and account for financial transactions, and monitor and report on their financial status. However, secondary data analysis and discussion with woreda officials and field level DAs demonstrated that, there are no formal financial systems and procedures to be administered at FTCs level.

Moreover, there is no regular plan or budget allocated from woreda to meet financial needs to ensure that FTCs have on hand the necessary funds to purchase the goods and services they need for their activities; despite financial resources obtained at FTCs, such as, revenue from income-generating activities of own compound are informally administered by FTC- management for such purposes as, monthly payment for security service, purchase of seeds and other inputs for the next cropping season, etc. An FTC which has basic materials and facilities, like class rooms, offices, residence, exhibition center, workshops, electricity, clinic, telecommunication, water etc. will perform better training.

However, it was observed that, there are no residence houses for DAs in both Tokuma and Gorbo FTCs. The DAs need to travel daily on average an hour to reach the FTCs from their residence in Asebot and Mi'eso towns. This affected effective use of working hours of the day since the DAs are required to spend two hours a day to travel on foot. Habtemariam (2007) also noted that, to provide skills training along with the required information, the DA needs to be equipped with the necessary facilities such as, the seed, fertilizer, tie rigger, scoop, treadle pump, planting material, chicken hay box, burdizo, energy saving stove etc., He shall not quit the training up on completion of the theoretical part.

4.4.3. Incentive mechanisms

An organization should aim for an optimum match between the human resources, their skills and expertise and the tasks they are assigned to perform. In addition, it is desirable to have a mechanism in place which helps them to upgrade their skills or develop new ones required by the work. There is no single force which motivates people to work in an organization. Secondary data (proclamations and directives) and discussions were held with woreda level management to assess incentive mechanisms currently functioning. The incentive mechanisms are steamed from the current extension strategy document, which recognized the importance of incentive mechanism in the growth of agriculture.

One of the many incentive mechanisms being operational in the woreda is, designing better salary scales and grade for DAs, which is operational since 2007. The other incentive mechanism is the opportunity created for DAs to participate on the Annual Farmers and Pastoralists Festival, which is functional since 2007. This was the national and regional level farmers' and pastoralists' festival celebrated annually during which farmers, pastoralists and DAs with outstanding performance are awarded gold medal and endowed recognition from higher government officials.

Another form of incentive mechanism is, the opportunity created for competent DAs to upgrade educational qualification is also operational as of 2008. In this opportunity, several development agents have improved their educational level from college diploma to B.Sc degree. At this juncture, the role of IPMS project is indispensable; the project has been supporting woreda and zonal level experts to upgrade their educational status in both first and second degree fellowship to enhance organizational capacities.

Over all, during discussions with DAs on the current management state of FTCs, DAs indicated that they often engage in non-extension activities and they are burdened with other jobs other than they are formally assigned for sometimes up to 40% of the annual time budget is spent on non-extension activities. They implicitly reflected that it is not known what has to be done and has not to be done at FTCs level. Currently, a large number of DAs are pursuing other streams qualifications than have been previously trained and assigned with. This issue needs to be scrutinized further in order to design appropriate intervention mechanisms.

4.4.4. Coordination and linkage mechanisms

Collaboration and networking between actors is a necessary condition for successful introduction of agricultural technologies; whereas, linkage mechanisms refer to organizational arrangements (e.g., meetings or administrative relationships) that help to link up the parts of the system. Coordination (e.g. mutual adjustment of activities), or resource transfers (perhaps credit, salary payments or shared labour) are important for effective extension work (Salomon and Engel, 1997).

Studying linkages can show whether (or how tightly) actors are connected to each other, how actors communicate and work together, and which actors and relationships are most important to the functioning of the system, FTC-based extension. When actors whose resources complement each other work together, the collaboration increases the effectiveness of all. Each actor then achieves more than they could alone. In this study, a rapid (or relaxed) appraisal of agricultural knowledge systems (RAAKS) tools were used to assess coordination and linkage mechanisms existing among the relevant actors that are assumed to work for effective functioning of FTCs in the study area.

As was tried to mention in the methodology section of this thesis, the main reasons behind the use of RAAKS tools in this study were, lack of active participation of rural households in the modular training programme, and lack of coordination between research, extension, agro-pastoralists, NGO and other relevant institutions in the study area. FAO (1998) noted that, the way research is structured and organized, and the planning and management of research-extension linkages, can limit or enhance extension's effectiveness. In this study, prior to task analysis, actors or institutions were identified and selected based on relevance with the roles and responsibilities they are expected to perform, and importance in terms of their contributions for effective functioning of FTCs as summarized in Table 16 below.

Table 16 Summary of task matrix of relevant actors

No.	Tasks Actors	TTR	ADV	TRG	IS & CR	RES	FMS	MARK
1.	WoPRD	✓	✓	✓	✓	-	✓	✓
2.	WoCP	✓	✓	✓	✓	-	-	✓
3.	Schools	-	-	✓	-	-	-	-
4.	IPMS	✓	✓	✓	✓	✓	✓	✓
5.	Research	✓	✓	✓	-	✓	-	-
6.	REFLAC	-	✓	-	-	-	-	-
7.	FGs	✓	✓	✓	-	-	-	✓
8.	Cooperatives	✓	✓	✓	✓	-	-	✓

Source: RAAKS and FGDs result, 2009.

Key:

TT	Technology transfer	AD	Advice /consultancy/
TRG	Training	IS & CR	Input supply and Credit
RES	Research	FMS	Financial and material support
MARK	Marketing		

Actors:

WooPRD	Woreda Office of Pastoral & Rural Development
WooCP	Woreda Office Cooperatives Promotion
IPMS	Improving Productivity and Market Success

HU	Haramaya University
OARI	Oromia Agricultural Research Institute
REFLAC	Research- Extension- Farmers Linkage Advisory Council
Cooperatives	PA-level basic cooperatives
FGs	Farmers' Groups
Schools	Elementary schools PA level.

Following the identification of relevant actors and tasks, “who does what and how in the system” data were analysed and illustrated in task matrix as shown in Table 16 above. The procedure for representing the task analysis is putting on the X-axis the knowledge related tasks and actors who perform these tasks on the Y-axis. The result of the task analysis indicated that, the potential actors working on knowledge generation are research agencies of MARC, MWARC, OARI and HU; and IPMS project, whereas, institutions found to work on technology transfer, extension/ advice/, training are WoPRD, WoCP, IPMS, FGs, REFAC, cooperatives and research agencies. The role of FGs is important in mobilizing indigenous technical knowledge and linking local people with outsiders.

Schools are also crucial institutions at grassroots level to indoctrinate the discipline of agriculture to rural youth and students to pursue modular training at FTCs after completion of their elementary schooling, as this segment of the community is intended to be the future educated farmers of the nation who adopts improved technologies and becomes competent in markets. Actors working on inputs supply and credit service in the study area were also identified as, WoPRD, WoC, IPMS and basic cooperatives. WoPRD and IPMS project are potential supporters of FTCs finance and material resources. Finally, WoPRD, WoCP, IPMS, FGs and basic cooperatives serve rural producers linking with markets.

The above task matrix also indicated there are functional linkages between actors performing different but complementary tasks. For instance, WoPRD, WoCP and IPMS. The other focus of analysis was on how the different actors are connected to each other, the linkages existing between these institutions, formal or informal and whether the linkages are strong or weak (frequency and intensity of contact) were also analysed. As mentioned in the previous paragraph of this sub-section, the linkage metrics was modified to incorporate the perceived importance of actors in their contributions to effective functioning of FTCs, to serve as source of knowledge/information/, technology or finance were identified and evaluated. Summary of the linkage analysis are illustrated in Linkage matrix as in Table 17 below.

Table 17 Linkage matrix of relevant actors working with FTCs

No	Actors	Linkages with FTCs				Importance* as a source of		
		Formal	Informal	Strong	Weak	K/I**	Technology	Finance
1.	WoPRD	Yes	No	Yes	-	3	3	3
2.	WoCP	No	Yes	No	Yes	2	2	2
3.	IPMS	No	Yes	Yes	-	3	3	3
4.	Research centers	No	Yes	Yes	-	3	3	1
5.	REFLAC	No	Yes	-	Yes	2	2	1
6.	Cooperatives	No	Yes	-	Yes	2	2	2
7.	FGs	No	Yes	Yes	-	3	3	1
8.	Schools	No	Yes	Yes	-	2	2	1

Source: RAAKS and FGDs result, 2009.

Key:-

Linkage: - Formal: - Administration/resource

-Informal: - Communication/ cooperation/

Contact: Intensity of contact among actors.

Importance*: Rate on “1” for less important, “2” for important, “3” for very important

****k/I:** source as knowledge/information/, technology or finance.

As results of the Linkage Matrix indicated, formal linkage only exists between WoPRD and PA level FTCs. This formal linkage is of administrative or resource, whereas, the other linkages between FTCs and other actors were found to be informal or communication/cooperation. The linkage matrix also depicts there is strong linkage between PA level FTCs and WOoPRD, research centers, IPMS project, FGs and schools; while, linkage between WoC, REFLAC and basic cooperatives was found weak. It has to borne in mind that, the strong linkage between FTCs and research centers in the study is not the result of deliberate and coordinated communication; rather it comes about by coincidence. Research agencies such as, MARC, MWARC, OARI and HU have been working on own research programmes since longer times in the area, and have frequent contact with FTC level DAs.

The DAs have taken the opportunities to intensively exploit the research agencies for FTCs functioning. With regard to importance of actors in terms of their contributions for FTCs, the linkage matrix shown that, WOoPRD, IPMS project, research centers and FGs were found to be very important sources of knowledge/ information and technologies. Furthermore, WOoPR and IPMS project are sources of finance for FTCs. WoCP and basic cooperatives were found as important sources of knowledge/ information, technologies and finance. Research centers, REFLAC, FGs and schools are less important in financial contribution for FTCs.

Over all, summary of the results of analysis on coordination and linkage mechanisms existing are summarized below.

- WoPRD and IPMS are potential actors working for effectiveness of FTCs in the study area.
- There are functional linkages between actors performing different but complementary tasks. For instance, WoPRD, WoCP and IPMS.

- In the study area, the perception of the main actors revealed that there exist poor coordination, and participants identified that absence of coordinating body as responsible for poor performance and structural missing link between actors.
- There are no formally established mechanisms to coordinate tasks between actors. WoPRD considered itself as the current coordinator of relevant actors in the woreda. However, WoPRD doesn't have the required technical and financial resources to coordinate the actors thereby achieve effective functioning of FTCs.
- Research-Extension- Farmers-Linkage Advisory Council (REFLAC) was assumed to be used as a linkage mechanism and learning platform in joint activities and reflection on problems and their solutions, however, this study revealed that the council is not more than an ad hoc committee with poor performance in the study area.
- Proper definition of roles and established clear line of authority among government institutions is lacking in the study area. Without putting relevant institutions in place, promoting farmers training alone cannot make a difference in the rural transformation process.
- Relevant actors such as, research, extension organization, inputs supply, credit, marketing institutions, NGOs, schools do not formal contact or line of authority at woreda level. Rather they cooperate sometimes one another when they need informal communication for organizational purposes.

4.5. Positive Deviances

In this study, it was attempted to assess the positive deviances which were accomplished in sample FTCs of the study area. Data were collected from respondents of trained agro-pastoralists, DAs and other key informants in the area, and subjected to qualitative analysis by using thematic transcriptions and narrations.

The summary of findings is presented below.

4.5.1. Adaptation of improved technologies

Mi'eso woreda is known for its unreliable moisture, and people in the area often suffer from recurrent crop failure and drought which significantly reduces animals and crops productivity. The probable reason for this may be lack of improved technologies of food and fodder crops that can adapt the environment and able to give yield. One of the many positive deviances observed and revealed during interviews and discussions with DAs and people in Tokuma and Gorbo sample FTCs, attempts were made to make trials of thirteen improved varieties of food and fodder crops to adapt to the area on individual farmers fields under the support and supervision of FTCs. This was done in collaboration with IPMS project in 2008.

Improved seeds of maize, haricot beans, buckwheat, cough pea and many others were supplied by the project. Trainings were provided, seeds sown, and trials were supervised by DAs. During harvesting, field days were organized and farmers, researchers, extension workers and other people were invited. Finally, improved seeds with higher adaptability were evaluated and disseminated for people in other PAs. Promisingly at present, seedlings of grafted mango, avocado, elephant grass and alpha-alpha are raised and distributing to neighbouring PAs. For instance, Gorbo FTC had raised 450 elephant grass seedlings and distributed to three neighbouring PAs in the summer rainy season of 2008. Tokuma FTC, on the other hand, distributed cuttings of alpha-alpha to 500households in the same year.

In both FTCs, perennial fodder and fruit trees, vegetables, hot paper and sweet potatoes are produced yearly with the purpose of demonstration and income generation. It was revealed that, incomes of farmers raising seedlings and sale to others are benefiting much from their efforts.

The other interesting positive remark observed in the area is the adaptation and adoption of sweet potato as risk reducing mechanism in drier areas through its drought tolerating ability; which at present nearly 50-60% of households are growing. This crop was not adapted to the area since the last three years.

4.5.2. Video show on natural resources management

Obviously, the purpose of any extension organization in a given area is to provide information to target beneficiaries. The efforts exerted to provide rural households with information on natural resources management and wild life conservation were observed as a positive implication in Gorbo FTC of the study area. According to the data obtained from DAs and people in this PA, IPMS-project has provided a 29 inch colour television, cassette recorder and generator as to other four FTCs including five desk top computers with printers and accessories.

The development agents took the opportunity to aid the modular training programme offered in natural resources management, they rent and purchase the cassettes from towns and display to the rural people in the FTCs. The video show is offered to rural households during night and leisure time. The participants disclosed that, as the area is moisture unreliable and drought and crop failure is recurrent phenomena, learning soil and water conservation practices and wild life conservation through video show has contributed much to introduce innovative techniques of water harvesting and increased awareness about their environment.

4.5.3. Animal fair

Animal fair is exhibition often held twice a year in Tokuma PA, at which farmers show their fattened bulls and goats to potential buyers and inform other farmers the methods and techniques they used. The fair is organized jointly with IPMS project and Tokuma FTC two times a year. The first one is organized immediately after harvesting of crops, during which the fattened goats and bulls body performance objectively exhibits the results of adoption of improved technologies and practices. The second one is conducted in May, during which the market price of livestock becomes higher because of the effect of longer dry winter season on cattle and goats. The purpose of the fair is twofold. First, it helps to demonstrate farmers with the results of improved technologies used in times of longer dry periods; and the second advantage is to inform agro-pastoralists to avail the high market prices come about before the summer season.

These programmes were initiated by IPMS project before a few years, up on its multiple effects; the project still assists the fair jointly with Oromia regional pastoralist development commission and FTCs. On the animal fair rural households, administration, potential buyers from Metehara, Awash, and officials are invited. Farmers with outstanding performance present their fattened bulls and goats and will be awarded in public and recognition is given for their achievements. Brochures, pamphlets and other information are provided for the participants. This forum creates the opportunity for producers to acquaint with traders and private companies.

The other positive remark of the fair was the opportunity created for farmers to become suppliers of inputs required for preparation of Urea-molasses multi-nutrient blocks (UMMB). This technology is a convenient and inexpensive method of providing a range of nutrients for animals. This UMMB consists of Molasses, UREA, cereal bran and meals, etc. yet, the inputs are not available in the area. Thus, some people upon the demand for these inputs started to supply from Awash, Metehara and Adama and sale in small towns in the woreda.

4.5.4. Market information for rural households

Long before transition became a burning issue, Johnson (1982) eloquently wrote, “Modern agriculture is very dependent upon its economic relations with the rest of the economy, through its use of nonfarm purchased goods and services and its need for efficient, reliable, and low-cost marketing services.” One reason for the marketing margins in developing countries to be high is that farmers have little information about current prices in nearby markets. Even traders have incomplete information about market conditions.

If farmers had better market information, trading would be less risky, so their risk premium would fall. The government and farmer organizations can play a useful role in collecting and disseminating prices and other marketing information. An encouraging initiation to be appreciated and scaled out was observed in study area. Tokuma and Gorbo FTCs are providing market information for the farmers on weekly bases.

The FTC level extension agents and farmers collect market information on major food crops of sorghum, sesame, maize, etc; and livestock prices of fattened bulls, goats, caw etc, during the market days of Mi'eso, Kora, Bordode and Asebot towns and they report to DAs, DAs check, compile and attach it on the wall of the FTCs where people can observe. Farmers, residents, traders and other interested people will look at the current market prices before making decisions on sales or purchases of items they want. This opportunity serves rural people residing in remote areas from main road and market with update market information.

4.5.5. Literacy among rural people

Encarta (2009) defines literacy the ability to read and write at a designated level of proficiency. Literacy is more precisely defined as a technical capability to decode or reproduce written or printed signs, symbols, or letters combined into words. Although definitions vary, functional literacy typically means the ability to read, write, and calculate figures well enough to carry out activities that many people consider necessary to function in society. Such activities include reading newspapers, reading training manuals in the workplace, understanding a highway map, and balancing a checkbook.

Agro-pastoralists competence in literacy is crucial to attend written type of training offered in FTCs. In this study, encouraging efforts were observed in sample FTCs, Tokuma and Gorbo that, collaborating with elementary schools in the PAs a program was designed to teach adults and youth (men and women) in FTCs during slack periods to help them read, write and identify signs, symbols, letters, figures etc, when they appear together in a written papers, books and printed items.

The main objectives of the literacy programme was to enable agro-pastoralists learn the subjects treated in modular training and get further understanding of improved technologies and practices. Currently, adults participated in the literacy programme have become active participants of modular training. It was also revealed that this programme will continue even in the future as the majority of agro-pastoralists, who are active actors in economy, are illiterate.

Thus, this programme needs to be strengthened in order to help rural households take the advantages of available technologies and become competent enough in the market. Overall, attempt was made to analyze strengths, weaknesses, opportunities and threats based on the findings of this study to offer a picture of existing challenges and opportunities in implementation of FTC-based modular training in the study area (see table 18). And it is hoped that, relevant institutions would give emphasis to strengthen collaborations and linkages to contribute for effective functioning of FTCs at grassroots level.

Table 18 Challenges and opportunities exist in implementation of modular training

No.	Attribute	Perspectives			
		Training	Trainees	Trainers (DAs)	FTCs
1.	Strengths	<ul style="list-style-type: none"> -Modular-based in design with menu of topics for selection based on needs & interest; -Based on crop & livestock commodity having a comparative advantage in a specific area; -Relevancy of training content with farmers needs and farming practices; -Ease of adaptation to local language (Afaan Oromo); -Warranted by the Green certificate; - Flexibility for local adaptation; -Incorporation of local indigenous knowledge; 	<ul style="list-style-type: none"> -Motivated to attend in the training on diversified topics selecting from the menu, -Interest to apply knowledge and skills acquired; -Accumulated indigenous technical knowledge, in fattening, dairying, water conservation practices, etc. -Market-oriented & having demand for improved technologies; -Good tradition of cooperation, transparency and experience-sharing; 	<ul style="list-style-type: none"> -Having ability to convey and impart knowledge and skills for trainees; -Ability to demonstrate skills in the field and classroom; -Good command of local language for ease of communication; -Determination to help farmers within a short slack periods & leisure time; -Creative and positive deviants (Gorbo & Tokuma); -Ability to collaborate & work with other stakeholders; 	<ul style="list-style-type: none"> -Situating at the center of rural PAs, serve as, focal points for farmers a pathway to enlightenment for improved technologies & information; -Center for support services; -Center for classroom & practical trainings; -Center for local adaptations of specific technologies; -Center for Kebele-net ICT ;

Table (Continued)

No	Attribute	Perspectives			
		Training	Trainees	Trainers (DAs)	FTCs
2.	Weakness	<ul style="list-style-type: none"> -Designed with out TNA processes, and hence, failure to design appropriate duration & training methods that fit to illiterate farmers; -Agro-ecology based, failure to address location-specific needs; -Lack of consideration of actual capacity of FTCs; -Little flexibility for local adaptation; 	<ul style="list-style-type: none"> -Illiteracy; -Reluctant to participate in the modular training; -Termination after registration; -Lack of innovativeness; -Sticking at backward production techniques; -Lack of commitment to take risks of adoption of improved technologies; 	<ul style="list-style-type: none"> -Limited involvement of trainees in practical demonstrations; -Focusing on classroom lecturing; -Limited skill in business plan preparation for new farm establishment; -Limited skill in communication skills; -Lack of periodical training of trainers; -Lack of technical backstopping from upper level SMSs; - Two-bosses problem; 	<ul style="list-style-type: none"> -Poor quality of building; -Lack of facilities, materials, infrastructure, demonstration plots, workshops, clinic, library, ICT, etc -Lack of required compound area & good fencing; - Lack of clearly defined mandate for FTC-management committee; -Lack of rules and procedures for performance management and resources and salary administration. -Lack of regular plan of budget support from government.

Table (Cont...)

No	Attribute	Perspectives			
		Training	Trainees	Trainers (DAs)	FTCs
3.	Opportunities	<ul style="list-style-type: none"> -Presence of training policy and strategy; -Construction of FTCs in each rural PAs; -Delivery of training course materials from government; -Limited flexibility for adjustment of training contents; -Delivery of menu technology-packages which have comparative advantages in a given agro-ecology (pastoral & agro-pastoral areas); 	<ul style="list-style-type: none"> -Existing indigenous technical knowledge on diversified production techniques to reduce risk; -Accumulated experiences in shifting production methods following the variable and erratic rainfall; -Existing underground water resources for irrigation; -Proximity to main markets (Chiro, Awash, Metehara, Mojo, Addis, etc.); -Suitable position to avail advantages of railway and asphalted main road crossing the woreda; -Emerging interventions in livestock development, marketing and infrastructure expansion; etc. 	<ul style="list-style-type: none"> -Current emphasis in strengthening local institutions; -Existing incentive mechanisms for promotion, up-grading educational status and award; -Attractive marketing prices for livestock & livestock products; -Emerging cooperation and networking among local government institutions; -Existing research programmes in the woreda; 	<ul style="list-style-type: none"> - Encouraging training policy & strategies of the government; -Consensus on the need for strengthening local institutions and hence, supports from GOs & NGOs; -Centers for training on small-rural industries; -Income generation from own services; -Coordination among development institutions;

Table (Cont...)

No	Attribute	Perspectives			
		Training	Trainees	Trainers (DAs)	FTCs
4.	Threats	<ul style="list-style-type: none"> -If not systematic TNA conducted before designing trainings; -Lack of continuity of the modular training due to absence of inputs supply and credit service; -Lack of timely supply of appropriate technologies or strengthening local innovation systems; -Lack of SMSs technical support and continuous monitoring of the training; -Lack of continuous and induction training for DAs (trainers). -Failure to incorporate local indigenous knowledge; 	<ul style="list-style-type: none"> -Failure to convince & mobilize rural youth, women and students to attend the training; -If much practical training sessions are not arranged for illiterate farmers; -Lack of cooperatives to wrestle the challenges of supplying improved technologies, credit & marketing; - Lack of in development of water point & irrigation; -Failure to see the results of training efforts on own operations and life; -Lack of special intervention to encourage women participation; 	<ul style="list-style-type: none"> -Lack of clearly defined job descriptions and roles at FTC level; -If not refrain from non-extension and regulatory activities; -Lack of continuous monitoring and backstopping; -If not two-bosses problem is resolved; -Lack of regular trainings and orientation on business planning; costs & benefits analysis, comparative/competitive advantages of commodities; -If not trainings are given on communication, gender, etc. 	<ul style="list-style-type: none"> -Lack of clearly defined mandate to authorize the power; -Failure to have basic materials, facilities, demonstration site and required area; -Failure to have regular budget plan and support from government; -Lack of coordination and strong linkages with relevant actors; -If not a conducive exit strategy is designed for project supports;

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary and Conclusions

A rapid and more sustained small holder agricultural development could be ensured through an on-going process of technology transformation and farmers' training together with other support services. The current concerted efforts of Ethiopian government for farmers training emphasize on providing trainings in a well- equipped fashion in farmers' training centers at grassroots level. Modular training is one of the many functions of FTCs. The training programme consists of several courses while a training course is composed of several sessions. The study area, Mi'eso woreda is one of the pastoral and agro-pastoral woredas of West Harerghe Zone of Oromia region. In the area, modular training has been offered for rural households since 2007.

This study focused on measuring effectiveness of modular training programme in terms of improvements in farmers' knowledge, attitude and practice levels, and exploring the current state of institutional and organizational management, coordination and linkage mechanisms with which FTCs are operating in the woreda. A multi-stage sampling procedure was followed to select sample PAs (FTCs) and sample respondents. Both primary and secondary sources were used to gather quantitative and qualitative data. A semi-structured interview schedule and checklist used for data collection after pre-testing and refinement. A "Teacher-Made Test" for measuring knowledge, Likert type of attitude scale and practice test for measuring practice level of sample households was adopted.

Moreover, FGDs, KII, RAAKS windows were also employed for the collection and on-the field-analysis of qualitative data to fulfill the objectives of the study. Descriptive statistical techniques of frequency, percentages, t-test and chi-square tests were used for analysis of quantitative data and test of significance, whereas, qualitative data were analyzed by thematic transcription, narration and observation. The findings of the study revealed that, the modular training offered in the study

area has achieved its objectives in terms of improvements in farmers' knowledge; attitude and practice levels that helped them enhance performance.

The findings of the study also reveal that, systematic and deliberate training needs assessment was not conducted before designing the modular training course materials. However, the content of training topics was found relevant and need-based with farmers and farming situations. Theories, concepts and examples offered in the training course modules were familiar to and harmonious with farming operations of training participants. The length of time planned to cover the training topics was found inadequate, and the total time taken to cover the training topics offered was also found insufficient as the analysis of this study revealed; despite the fact that, the time or season of training was convenient to the farmers. In the area, no consultation was made with rural households to fix the duration of the modular training. Training method mostly employed during the modular training was classroom lecture, and the proportion of theoretical session was too much when compared with practical one.

However, field practice and demonstration are more preferred instructional methods as significant proportion of trained households demonstrated. In addition to this, the study found that, the appropriate style of training preferred by sample respondents was, offering trainings with intervals following calendar of farming operations in the area. Furthermore, high levels of trainees' participation and experience sharing, as well as use of indigenous knowledge were observed during training sessions. It was also found that, trainees were selected for modular training by development agents. The preferred criteria for trainees' selection for future programmes suggested literacy and being model farmer.

The age composition and nature of farming experience of participants was heterogeneous, whereas, the educational status was found similar. Trainers were found competent, by having very good communication and facilitation skills, approachable and having familiarity with farmers and the area. The study also clearly showed that, women's participation in the modular training was very low.

However, women's productive role in livestock production and marketing was found substantial in the household. This was due to preventive cultural influences that prohibit emphasis for women.

This study clearly shown that, institutional services presumed to support the functioning of FTCs at grassroots level, inputs supply, credit, product marketing and cooperatives have poor performance and farmers suggested that continuity of the modular training programme in the area is constrained by lack of timely supply of improved technologies, lack of credit service and problems of product marketing. The only sources of credit in the last twelve months were private dealers and IPMS project. The role of middlemen affected producers to sale their products on market prices. Findings with regard to organizational management aspects of FTCs demonstrated that, there is no clearly defined mandate given to FTC level management to effectively authorizing its mandate to carry out the perceived responsibilities.

Moreover, FTC level management doesn't have formal record that reveals staff roles, task and performance management, staff development, salary administration, team development and conflict management or coordination system. This study found that, FTC level management is working with no or insufficient capacity, budget, skilled administration personnel, etc. DAs are recruited, assigned and evaluated by WoPRD. In addition to this, no formal financial systems and procedures are in place to be administered at FTC level. There are no a financial rules and regulations that would meet the requirements of the providers of the financial resources whether they are donors, lenders or clients who pay for goods and services received at FTCs level.

Furthermore, there is no regular plan or budget allocated for FTC level management from the government to meet financial needs to ensure that the FTCs have on hand the necessary funds to purchase the goods and services they need for their activities. FTCs do not have residence houses for DAs, workshops, electricity, clinic, telecommunication and water. The current incentive mechanisms existing at FTCs level are, improvements in better salary scales and grade, opportunities created for invitation to take part in the national and/or regional farmers' festival celebrated annually on which DAs with outstanding performance are awarded gold Medal and recognition is provided from the government.

Another form of incentive mechanism existing is the opportunity to upgrade educational qualifications and the subsequent salary improvement. With regard to coordination and linkage mechanisms revealed that, there is poor coordination, and absence of coordinating body as responsible for poor performance and structural missing link between actors. WoPRD and IPMS project were found potential actors working with FTCs at grassroots level. Functional linkages also exist between actors performing different but complementary tasks. REFLAC was assumed to serve as current linkage mechanism in the area; however this study revealed that, the council is not more than an ad hoc committee with poor performance with any formally established structure.

This study also demonstrated the positive remarks that have been achieved in FTCs. Accordingly, adaptation and dissemination of improved food and fodder crops that can better meet climatic needs of specific agro-ecology of the area was implemented by FTCs. Moreover, facilitating video show for rural households on natural resources management, organizing animal fair and exhibition; providing timely market information for rural people and literacy programmes are currently functioning in FTCs in the area. These are the prominent positive deviances practiced in the study area.

5.2. Recommendations

The following recommendations are made based on empirical findings that were discussed in the previous sections of the study:

- This study revealed that, modular training in the study was implemented without the prior studies of training needs and interests of farmers. This resulted in the design of inadequate duration and instructional methods which failed to meet the realities of households in the area. Therefore, systematic training needs assessment processes should be conducted to plan effective training programmes based on type, depth, and scope of problems and needs and diversified characteristics of farmers. Furthermore, training needs of rural households on diversified types of improved technologies should be addressed based on the nature of farming systems.

- The results of analysis in this study demonstrated that, trainings offered on improved technologies of livestock production and soil and water conservation were relevant and need-based. The content of trainings on these technologies was found harmonious with farming operations and farmers' circumstances. Therefore, woreda and PA level institutions need to access these technologies for farmers by minimizing the impact of institutional and infrastructural barriers; i.e., strengthening farmers' groups, cooperatives and rural credit, financial and other institutional support services.
- Training methodologies employed in the modular training were dominated by classroom lecture and theoretical sessions, as evidenced by this study. One of the main reasons behind this was lack of availability of basic materials and facilities at FTCs level. Therefore, resources have to be mobilized from relevant institutions (government and non-governmental organizations) to fulfill the training centers with the necessary materials and equipments to enhance effective functioning at local level. Efforts and supports being made by IPMS project should be enhanced and strengthened by other actors too.
- It was evident in this study that, FTC level management doesn't have formal record that reveals mandate, performance management and resources administration rules and procedures to be exercised at the grassroots level. Currently FTCs are working with no or insufficient capacity, budget, skilled administration personnel, etc. DAs working at FTCs level are accountable to woreda office not the local community. The government should give emphasis to strengthen and support the centers so that, they can serve as a center for transfer of improved technologies and information for local people. Empowering the local people with resources and institutions could help ease the situation and paves the way for exploitation of local development opportunities.
- Institutional coordination and linkages analysis in this study revealed there is poor coordination, among relevant institutions that are supposed to work with FTCs, and absence of coordinating body was identified as responsible for poor performance and structural

missing link between actors. Therefore, the government should design alternative coordination mechanisms either by creating a system linking relevant institutions to harness their resources and expertise for effective functioning of FTCs, or creating coordination mechanisms within individual institutions, so that, they can discharge their responsibilities to the extent possible.

- Illiterate farmers need to be demonstrated with best practices and be able to learn practically. Concerted efforts should be exerted to wrestle with preventive socio-cultural influences against women, and emphasis has to be given to women to enhance their capacities through training, credit and other institutional supports. Women need to be assisted with low cost, energy and time saving technologies. Similarly, the local government and non - governmental organizations can launch adult literacy programs and basic skill trainings with minimum costs for rural women and youth. The literacy programme already started in some FTCs should be extended and strengthened.
- The role of schools in rural areas is crucial for convincing and preparing students to pursue modular training at FTCs after the completion of elementary education. Because these rural youngsters are the future educated farmers who will be able to read written notes, understand and implement new agricultural technologies in scientific manner. This study found that, especial emphasis was not given to recruit rural youth and students for modular training. Thus, woreda and PA level administration must start to convince and recruit rural youth and students to pursue the modular training and graduate with Green Certificate.
- The positive deviances accomplished in the study area, providing market information regularly on weekly bases, literacy classes, fairs, use of audiovisuals like video show, and adaptation of improved varieties etc, should be scaled out to another areas, since they are not common in other FTCs in the country.

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7. APPENDICES

Appendix Table 1 Demographic characteristics of sample households

Characteristics	Trained HHs (N=70)		Untrained HHs (N=70)		Total (N=140)	
	Freq.	%	Freq.	%	Freq.	%
Sex: Male	58	82.8	66	94.28571	124	88.5
Female	12	17.2	4	5.714286	16	11.5
Age: 20-35	45	64.2	50	71.42857	95	67.8
36-50	25	35.8	16	22.85714	41	29.4
51-65	-	-	4	5.714286	4	2.8
Family size: 1-4	39	55.7	52	74.28571	91	65
5-8	29	41.5	13	18.57143	42	30
9 & above	2	2.8	5	7.142857	7	5
Education level:						
Illiterate	49	70	47	67.1	96	68.3
Able to read & write	9	12.8	15	21.5	24	17.2
Grade 1-4	4	5.7	4	5.7	8	5.7
Grade 5 & above	8	11.5	4	5.7	12	8.8
Distance from FTC (km.)						
< 1km.	24	34.3	-	-	24	17.1
1-3km.	31	44.2	-	-	31	22.1
>4kms.	15	21.5	-	-	15	10.8

Source: Own survey output, 2009.

Appendix 1 Interview schedule

I/ For Trained Sample Respondents

1. Woreda _____ Name o Interviewer _____
2. PA/FTC/ _____ Signature _____
3. Name of household head _____ Date _____
4. Sex: Male =1, Female = 2. Serial No. of the IS _____
5. Age (in years): _____
6. Marital status: 1) Married 2) Unmarried 3) Divorced 4) widowed
7. Educational status: 1) Unable to read and write 2) Able to read and write
3) Grade 1-4 4) Grade 5-8 5) above 8th grade
8. Family size: Total _____, Male _____, Female _____?
9. How remote is found your household from 1. FTC? _____
2. Woreda town? _____
10. Is there FTC in your PA? Yes= 1, No=2.
11. If yes, which year was the FTC constructed? _____.
12. Have you participated in modular training in the past three years? Yes= 1 No=2
13. If yes, what were the major training topics offered? Specify?
14. Have you been consulted for need on training before the training? Yes= 1 No=2
15. Have you been consulted for need on knowledge training? Yes= 1 No=2
16. Have you been consulted for interest to receive training? Yes= 1 No=2
17. Have you been consulted for need on skill training? Yes= 1 No=2
18. Was the trainings content relevant and need based? Yes= 1 No=2
19. Were the contents of the training topics relevant to your farm operation and farm setting?
Yes= 1 No=2
20. Were the contents of the training topics in harmony with your farm operation?
Yes= 1 No=2
21. If no, what training topics /contents/ you think the training would incorporate? Specify?
21. For how long was training offered? (1) Three months (2) Three to six months
(3) Six months (4) More than six months

22. Was the time planned to cover training topics adequate? Yes= 1 No=2
23. Was the time taken to cover training topics sufficient? Yes= 1 No=2
24. Was the training time convenient for you? Yes= 1 No=2
25. Have you been consulted for fixing the duration of the modular training? Yes= 1 No=2
26. In your opinion, what is the appropriate duration to for training?
 (1) Three months (2) Three to six month (3) Six months (4) More than six months
27. In your opinion, which months of the year are appropriate for training?
 (1) September - November. (2) December - February (3) March - May (4) June - August
28. In your opinion, how many days of a week are preferred for training?
 (1) Two (2) Three (3) Four (4) Five
29. In your view, which period of the day time is appropriate for training?
 (1) Morning 2:00 - 4:00LT (2) Morning 3:00-5:00 (3) Afternoon 8:00 - 10:00LT
30. In your opinion, what is the preferred style of training? (a) Continuous (b) With interval.
31. In your view, what was the proportion of theory and practice in modular training offered?
 (1) To much theoretical session (2) To much practical session
 (3) Theoretical and practical session proportional (4) such proportions were not considered
32. Which method(s) of training were used during the training?
 (1) Class room lecture (3) Visiting demonstration fields
 (2) Field practice and practical demonstration (4) Peer group learning
33. Which method(s) of training you think is most appropriate?
 (1) Class room lecture (3) Visiting demonstration fields
 (2) Field practice and practical demonstration (4) Peer group learning
34. Have you been given any training materials? (1) Yes (2) No
35. If no, why not? Specify. _____
36. Did you terminate the training? (1) Yes (2) No
37. If yes, what was the reason?
 (1) Shortage of labour in the HH (2) Irrelevance of training topics
 (3) Difficult to understand (4) Unable to read & write (5) other, specify
38. How did you evaluate the participation of trainees during the training?
 (1) Low (2) High

39. How did you evaluate the extent of experiences sharing during the training?
 (1) Low (2) High
40. How did you evaluate the extent of use of indigenous knowledge during the training?
 (1) Low (2) High
41. Who has selected you for the training?
 (1) DA (2) Supervisor (3) Farmers' group (4) WoPRD (5) other, specify
42. In your opinion, what were the criteria for trainees' selection?
 (1) Literacy (2) Being model farmer (3) Being cabinet member (4) other, specify
43. In your view, what is/are/ the preferred criteria for trainees selection?
 (1) Literacy (2) Being model farmer (3) Being cabinet member (4) other, specify
44. What was the nature of age composition of participants of the training?
 (1) Heterogeneous (2) Similar
45. What was the nature of participants' educational level?
 (1) Heterogeneous (2) Similar
46. What was the nature of participants farming experiences?
 (1) Heterogeneous (2) Similar
47. In your opinion, what was the proportion of male and female participants?
 (1) More males and few females (2) More females and few males (3) proportional
48. If female participants were less than males what do you think was the reason?
 (1) Cultural influence (2) Lack of motivation (3) Lack of awareness
 (4) Lack of advice from DAs, (5) Fear of male participants (6) Occupied by HH activities
49. How do you evaluate the competence of trainers during training?
 (1) Not competent (2) Competent
50. How do you evaluate the communication skill of the trainers during training?
 (1) Poor (2) Average (3) Very good
51. How do you evaluate the facilitation skill of the trainers during?
 (1) Poor (2) Average (3) Very good
52. How do you evaluate familiarity of the trainers with you and the area?
 (1) All are familiar (2) Only some are familiar (3) All are not familiar
53. How did you evaluate the approach of trainers during training?

(1) More friendly (2) Friendly (3) Not friendly

55. Where do you place the use of the following training aids used during the training?

N.B:- Rate “0” for Never, “1” for Rarely, “2” for Often, “3” for Always for frequency of use of materials and aids during training.

1. Textbooks and handouts _____
2. Video and Slide films _____
4. Models (fertilizers, seeds, soils, seedlings, trees, etc) _____
5. Field equipments _____
6. Demonstration materials _____
7. Black board and chocks _____
8. Posters, brochures, etc. _____
10. Other, specify _____

56. Knowledge test on Beef Cattle Production and Management

1. What is name of the known local breed most preferred for beef production in Harerghe zone?
2. Mention three important criteria should be emphasized before beef farm establishment?
3. How much area of a house is required to fatten two bulls?
4. Name two factory by-products extracted from oil crops?
5. How many days will it take to fatten a bull with a balanced feeding system?
6. List three symptoms of an animal affected by Rabies?
7. What will be the daily weight gain of a bull of Borena breed if provided with 7.5kg of roughage?
8. Mention three measures taken to recover an animal affected by from foot and mouth disease?
9. How many kg of concentrate should be provided for a bull daily in improved beef farm?
10. Name two techniques used to castrate fattening bulls?
11. Vaccination helps to prevent than control of animal diseases. 1) True 2) False
12. Mention two merits of castrating growing calves?

57. Knowledge test on Improved Dairy Cattle Production and Management

1. Name three local cattle breeds known for high production of milk in Oromia region?
2. How many kg of roughage should be given daily for a matured dairy cow weighing 450kg?
3. Mention the name of one exotic dairy cattle breeds widely found in Ethiopia?
4. How much UREA fertilizer should be applied on ten hectares of pasture land?
5. A young bull of one year is preferred for breeding purpose? 1= True 2=False
6. List three criteria to be focused on during establishment of a new dairy farm?
7. What is the area of a house required for a matured dairy cow?
8. Name a sugar-plant by-product used as a concentrate?
9. List the two forage types required for silage preparation?
10. How many kg of concentrate feed should be given to a lactating cow to gain an additional milk yield of two liters per day?
11. List three procedures that must be performed during hand milking?
12. How many hours the cow should be withheld from mating or insemination since standing heat sign?

58. Knowledge test on Soil and Water Conservation Technologies

1. Mention three major advantages of flood water diversion?
2. How many centimeters of depth should be dug to construct stone bund?
3. Name three renewable energy resources that can be used in Mi'eso woreda?
4. Mention an energy saving technology that can be used in areas where there is large number of livestock?
5. Name one of a fuel saving technologies most used in west hareghe zone?
6. How many hectares of a watershed area is recognized as micro-catchment?
7. Name a water harvesting technology most appropriate for areas receiving annual rainfall of below 500mm?
8. The diameter of a large semi-circular bund is _____?
9. List three important materials used to prepare compost?
10. Mention four types of biological soil conservation methods?

11. What is the ratio of forest soil, sand and compost required respectively to raise seedlings in a nursery?

12. List four major stages of soil erosion?

59. Read the items in the following Table and put a tick (✓) mark in one of the five boxes which indicates best your attitude on improved beef cattle production technologies.

Attitudes of Farmers towards Improved Beef Cattle Production Technologies

No	Indicators	Level of Satisfaction				
		SA	A	Ud	D	SD
1.	Improved bull fattening greatly increases income of pastoralists.					
2.	Consideration of hay availability in beef farm planning is not worthy.					
3.	Modern fattening reduces the duration than needed to fatten in traditional methods.					
4.	Use of Borena breeds for fattening has high rate of return than Ogaden.					
5.	Improved forage development will enhance beef cattle productivity.					
6.	Hygiene and sanitation practices don't help to recover an animal affected by FMD.					
7.	Castration of growing bulls doesn't have any effect on weight gain.					
8.	Cut and carrying system of forage is not required in abundant moisture areas.					
9.	Travelling of fattened bulls on foot for long distance has a positive effect on animals.					
10.	Observation of the body of beef cattle during purchase is enough for identification.					
11.	Vaccination doesn't have any positive effect on recovery of animal affected by FMD.					
12.	A loose housing doesn't have any problem on feeding of beef cattle.					

Key: SA = Strongly Agree, A = Agree, UD =Undecided, D= Disagree, SD = Strongly Disagree

60. Read the items in the following Table and put a tick (✓) mark in one of the five boxes which indicates best your attitude on improved dairy cattle production technologies.

Attitudes of Farmers on Improved Dairy Cattle Production Technologies

Sr. No	Indicators	Level of Satisfaction				
		SA	A	Ud	D	SD
1.	Milk yield record keeping is good in dairy farm.					
2.	Use of cake meal reduces productivity of dairy cattle.					
3.	An improved method of milk churning reduces yield loss.					
4.	Vaccination prevents introduction of diseases into a dairy farm.					
5.	Use recommended dairy package is waste of money.					
6.	Spraying pesticides twice a month has a negative effect on dairy farm.					
7.	Providing concentrates for a dairy cow enhances milk yield.					
8.	Ear tagging of dairy calves doesn't have any benefit.					
9.	Focusing on pasture land availability is not feasible in modern dairy farm.					
10.	Urea block multi-nutrient doesn't have any advantage for cows.					
11.	Lucenea and susbania trees are important for shedding purposes.					
12.	Use of loose housing is feasible in areas where there are only few cows.					

Key: SA = Strongly Agree, A = Agree, UD =Undecided, SD = Strongly Disagree

61. Read the items in the following Table and put a tick (✓) mark in one of the five boxes which indicates best your attitude on soil and water technologies.

Attitude of Farmers towards Soil & Water Conservation Technologies

Sr. No	Indicators	Level of Satisfaction				
		SA	A	Ud	D	SD
1.	Soil conservation is very important for fertile soil management.					
2.	Stabilization of Gullies increases area of pasture land.					
3.	Intercropping of rough pea with sorghum will decrease both yields.					
4.	Growing multi-purpose trees doesn't contribute for soil conservation					
5.	Use of fruit trees plantation has advantage of income generation along with SC.					
6.	Livestock production and soil conservation strategies can't go hand in hand.					
7.	Controlling overgrazing of cattle enhances the conservation of soil.					
8.	Use of strip grass is not a feasible recommendation.					
9.	Biogas technology extension helps to increase afforestation practices.					
10.	Biological methods of S&WC have a negative effect on income of rural HHs.					
11.	Use of Mirxi middijja doesn't have any contribution to forest conservation.					
12.	Community forest development efforts contribute to create communal ownership.					

Key: SA = Strongly Agree, A = Agree, UD = Undecided, SD = Strongly Disagree

62. Practice Test on Improved Beef Cattle Production Technologies

Can you perform the following practices properly? If yes, explain briefly the steps to be followed during implementation. (Mark "1" for 'Yes' and "0" for No responses)

1. Cattle shed trees planting? _____

2. Spraying insecticides? _____

3. Silage pit preparation? _____

4. Construction of beef cattle house? _____
5. Feeding beef cattle? _____
6. Record keeping? _____
7. Grading fattened beef cattle? _____
8. Ear tagging? _____
9. Carrying out marketing research? _____
10. Castrating male animals with burdizzo? _____
11. Restraining bulls? _____
12. Production of improved forage? _____

63. Practice Test on Improved on Dairy Cattle Production technologies.

Can you perform the following practices properly? If yes, explain briefly the steps to be followed in implementation. (Mark “1” for ‘Yes’ and “0” for No responses)

1. Silage preparation? _____ .
2. Carrying out a layout of loose house? _____
4. Dehorning? _____
5. Butter churning from cream? _____ .
6. Wrapping and storage of butter? _____ .
7. Deforming of parasites? _____
8. Recording animal purchase and sale? _____
9. Drenching? _____
10. Manuring a pasture land? _____
11. Hoof trimming? _____
12. Open castration? _____

64. Practice Test on Soil & Water Conservation Technologies

Can you perform the following practices properly? If yes, explain briefly the steps to be followed in implementation. (Mark “1” for ‘Yes’ and “0” for No responses)

- 1. Check dam construction? _____
- 2. Carrying out layout of cut-of-drain? _____
- 3. Trimming of seedlings with scissors? _____
- 4. Construction of large semi-circular bund? _____
- 5. Designing of seedling beds on own farm? _____
- 6. Measuring land gradient? _____
- 7. Micro-basin construction? _____
- 8. House hold pond construction? _____
- 9. Planting seedlings of wind break? _____
- 10. Surveying vertical interval? _____
- 11. Tie-ridging? _____
- 12. Intercropping of feeds? _____

65. Have you ever used any improved technologies during the past twelve months? Yes=1, No=2

66. If yes, which types of inputs? (1) Food crops seeds (specify) (2) Fertilizers (sp.)
(3) Cattle breeds (sp.) (4) Forage seeds (sp.) (5) Concentrates (sp.)
(6) Vaccines (sp.) (7) Pesticides (sp.) (8) other specify

67. If no, why not? (1) No timely supply (2) Lack of input(s) supply
(3) Lack of money/credit (4) Fear of drought
(5) Lack of quality input(s) (6) High inputs price (8) other, specify

68. Have you ever received any formal credit in the past twelve months? Yes =1, No=2

69. If yes, what was/were/ the source(s) of the credit? Rank

1. Cooperative/Union	_____
2. Credit institution (Specify)	_____
3. Woreda office of A/PRD	_____

4. NGO(s) specify _____

5. Others, specify _____

70. Have you ever received any informal credit in the past twelve months? Yes =1, No=2

71. If yes, what was/were the source(s) of the credit? Specify?

72. Did you face any marketing problem(s) in the last twelve months? Yes =1, No=2

73. If yes, what is/are the problem(s)? Specify?

74. What are the major changes you have achieved after the training? (Specify).

(1) Increase in productivity (2) decrease in defects (3) cycle time reduction (4) Other, specify

75. Please, provide any suggestion to improve effectiveness of trainings at FTC level? (Specify).

Interview schedule for household survey

I/ for untrained Sample Respondents

1. Woreda _____ Name o Interviewer _____

2. PA/FTC/ _____ Signature _____

3. Name of household head _____ Date _____

4. Sex: Male =1, Female = 2. Serial No. of the IS _____

5. Age (in years): _____

6. Marital status: 1) Married 2) Unmarried 3) Divorced 4) widowed

7. Educational status: 1) Unable to read and write 2) Able to read and write
3) Grade 1-4 4) Grade 5-8 5) above 8th grade

8. Family size: Total _____, Male _____, Female _____?

9. How remote is found your household from 1. FTC? _____

2. Woreda town? _____

10. Have you ever been contacted by a development agent? Yes= 1, No=2

11. If yes, how often the DA contacts you?

(1) Once every week, (2) Once every two weeks (3) Once every month
(4) Once every three months (5) Once during farm operation (6) Once in a year.

12. By which mode of contact the DA approached you?

(1) At home (2) At farm place (3) In the market (4) In the office (FTC) (5) During meeting

13. Have you ever contacted the DA for advice in the past twelve months? Yes= 1, No=2.

14. If yes, how often do you contact the DA for advice?

- (1) Once every week, (2) Once every two weeks (3) Once every month
(4) Once every three months (5) Once during farm operation (6) Once in a year.

15. For what purpose you often contact the DA? (1)Advice and information (2) Need for Inputs
(3) Whenever disease/insect pest occurs (4) other, specify

16. Did you find the advice helpful to your farm operation(s)? Yes= 1, No=2

17. If no why not? (1) Don't know the presence of DA, (2) remoteness from DA house, (3) doesn't worth more than my own effort, (4) other, specify

18. Have you ever attended any demonstration or farmers' field day arranged by a development agent within your PA? Yes= 1, No=2.

19. If yes, on type of activities did you attend? _____, _____, _____

20. Have you ever visited areas outside your PA, such as other communities, towns etc? Yes=1
No=2

21. If yes, how often do you visit the areas?

- (1) Every week (2) Every month (3) Rarely (4) Do have interest (5) other, specify

22. If you visit frequently, what is the purpose of your visit (1) Marketing (2) Purchase of inputs

- (3) Social issues (4) to see physician (5) Information (6) Recreation (7) other, specify

23. Do you have access to agricultural inputs? Yes=1, No=2

24. If yes, to which types of inputs? (1) Fertilizers (2) pesticides (3) improved varieties (4) Feeds

- (5) Vaccines (6) Cattle breeds (7)other, specify

25. If no, why not? 1)Lack of knowledge of inputs (2)Lack of money (3) Remoteness from market /FTC/
(4)Lack of credit (5)Do not have land (6)Shortage of HH labour

26. Have you ever used any improved technology during the past twelve months? Yes=1, No=2

27. If yes, which types of inputs? (1) Food crops seeds (specify) (2) Fertilizers (sp.)

- (3)Cattle breeds (sp.) (4) Forage seeds (sp.) (5) Concentrates (sp.) (6) Vaccines (sp.)

- (7) Pesticides (sp.) (8) Other specify

28. If no, why not? (For those who can have access) (1) No timely supply
(2) Lack of input(s) supply (3) Lack of money/credit (4) Fear of drought
(5) Lack of quality input(s) (6) High inputs price (7) Low output price (8) other, specify

29. Have you ever received any formal credit in the past twelve months? Yes =1, No=2

30. If yes, what was/were/ the source(s) of the credit? (specify)

31. Have you ever received any informal credit in the past twelve months? Yes =1, No=2

32. If yes, what was/were the source(s) of the credit? Specify?

33. Did you face any marketing problem(s) in the last twelve months? Yes =1, No=2

34. If yes, what is/are the problem(s)? Specify?

Reminder: Untrained sample households should be asked all of knowledge, attitude and practice test items mentioned above in Appendix1.

Appendix 2: Checklist for FGD and KII

I) Farmers' Training Center Management Committee

1. Total number of HHs in the PA being served by extension.
2. Objectives (purposes) of FTC;
3. Major services offered by FTC currently;
4. Mandate of FTC management committee;
5. Modular training offered in the past three years;
6. The level of participation in the processes of modular training design & implementation.
7. Important components of training processes, training needs assessment (Who, how, when, where, what).
8. Potential and relevant actors assumed to work closely with FTC management.
9. Tasks and roles of the actors/institutions/(technology transfer, training, advice, inputs supply, credit, research, marketing, financial and material support etc).
10. What and how the actors work in the system?
11. Linkages and contacts (formal/ informal), strengths and weaknesses, important sources of knowledge and information, technology,
12. Coordination mechanisms, collaboration and networking,
13. Evaluation of modular training, flexibility and feedbacking;
14. Curriculum change and/or incorporation of new knowledge and information based on the feedback in MT in the past three years.
15. Frequency of curriculum changes.
16. Functions of marketing and other support service institutions (such as, inputs supply, credit, information etc)?
17. Marketing problem(s) farmers face in the last twelve months?

18. Formal institutions /rules and procedures/ for human, financial and material resources management/administration, incentive mechanisms / at FTCs level;
19. Management & controlling mechanisms of budget, fund receipt and internal revenue, and fund allocation and expenditure of your FTC?
20. Human resources of FTC, currently working since the last twelve months, Name, sex, years, qualifications, service years (total/ at this FTC), field of training, etc
21. Technical and financial support(s) offered by woreda and above level offices/institutions to your PA level FTC?
22. Registration, drop out and graduation of trainees of modular training.
23. Major changes after modular training and positive deviances?
24. Major challenges and opportunities exist in implementation of modular training?

Appendix 3: Checklist for individual interview with DAs

1. Which year was MT started? _____
2. Who has designed the modular training? _____
3. Training needs assessment procedures, curriculum development methodology, duration;
4. Farmers selection criteria for modular training, training approach;
5. Women participation, special mechanisms for encouraging women;
6. Competence of trainers, communication and facilitation skills;
7. Role of schools in inducing youngsters towards modular training or (FTC);
8. Demonstration fields, basic facilities & materials;
9. Technical backstopping of woreda level SMSs, incentive mechanisms; other challenges;
10. What are the major weaknesses of the modular training programme?
11. What training methods and practices do you use during training?
12. What training materials and aids do you use during training?
13. Has the availability and use of these materials and aids improved over the past 3 years?

14. List your important source of knowledge and information (both technical and non-technical) for your training activities?

15. What are the new ideas you introduced in your FTC, which (in your view) are not common in other FTCs?

16. What are the major challenges and opportunities exist in implementation of modular training? (Please, specify strengths, weaknesses, opportunities and threats on training, trainees, trainers and FTCs perspectives).

Appendix4: Checklist for study of current status of FTCs

1. Year of construction: _____
2. Who constructed the FTC? (Budget source)
3. What is the total area on which the FTC building is constructed (in sqm?) _____
4. What is the estimated total land area reserved for demonstration (in sqm) _____
5. Material(s) for wall construction _____
6. Material(s) for roof construction _____
7. Material(s) for floor construction _____
8. How many rooms does the FTC have? _____
Class rooms, offices, store, workshops, toilet, meteorology, residence houses.
9. How many farmers does the FTC accommodate at one time during training session?
8. Does the FTC have fence? _____
9. Materials were used for fencing? _____
10. Does the FTC have access to the following infrastructure facilities? telecommunication, electricity, water and ICT etc .
11. Estimated distance from the FTC to woreda town in Km. _____
12. Does the FTC have demonstration plots for?
13. When was the FTC started offering MT (year) _____
14. How many farmers were trained so far? MT Total _____, Male _____, Female _____
15. How many number of farmers graduated with “Green Certificate”: _____
16. What types of support were offered by non- government organizations during the last three years?
19. What are the critical gaps/problems for effective functioning of the FTC?
20. What are the critical supports (technical, financial) you think required from the government?
21. What are the critical supports (technical, financial and material) you think required from the non-government organizations?

Appendix 5: Checklist for FGDs & KII

1. TNA procedures, designing and development of modular training programme;
2. Delivery of the modular training;
3. Monitoring and evaluation, flexibility for local adaptations;
4. Human resources management, incentive mechanisms, etc.
5. Financial resources management (rules and procedures);
6. Presence of regular budget plan & other supports from government & other sources;
7. Information on cooperatives; PA level extension units (strengths and weaknesses)
8. How are the tasks coordinated between relevant actors and FTC level agents?
9. Information on REFLAC and the role of farmers;
11. Collaboration and networking;
12. Coordination and linkages among relevant institutions;
13. Means of communication and information access, including ICTs;
14. Means of transport for field level extension agents;
15. In-service training of DAs, experts (SMSs), salary and incentive mechanisms;
16. Responsibilities and accountability of DAs, etc.