

TRANSFER OF LEARNING: Factors Influencing the Transfer of Learning in Training Smallholder Farmers by Agritex Extension Workers in Zimbabwe on Moisture Conservation Innovations.



'You can take a horse to the river but you cannot force it to drink the water'.

A Research Project Submitted to Van Hall Larenstein University of Applied Sciences in Partial Fulfillment of the Requirements of Degree of Master in Management of Development, Specialisation Rural Development and Communication

By

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Abbreviations

AEW	– Agricultural Extension worker
AES	- Agricultural Extension Supervisors
Agritex	– Agricultural Technical and Extension Services
AMID	- Ministry of Agriculture, Mechanization and Irrigation Development
DAEO	- District Agricultural Extension Officer
NGO	- Non-Governmental Organisation
PAEO	- Provincial Agricultural Extension Officer
GMB	-Grain Marketing Board

Abstract

Zimbabwe is a country where rainfall is unreliable and its frequency and intensity has decreased for the last ten years now. This is affecting the growth of crops especial for most smallholder farmers who are depending on rain fed agriculture. In order to improve maize productivity in the areas affected by dry spell Agritex and support from NGOs and other organisations are training smallholder farmers on new moisture conservation innovations. This helps to improve moisture availability to crops when there is a dry spell during the growing season. The aim of training farmers the new innovations is to transfer learning so that they use the knowledge and skills in their farms thereby improve crop productivity. This research has identified the factors that influence the transfer of learning in training small holder farmers on the new moisture conservation innovations by Agritex. Different training approaches used by Agritex extension workers were identified and how they can support and hinder transfer of learning on new innovations.

This study used a case study where 3 AEWs from Agritex department and 6 small holder farmers who are trained on the new moisture conservation innovations were interviewed. The training sessions were observed and also the farmer practices were observed. The farmers interviewed were selected from the list of farmers who are being trained on new innovations in Marondera district. AEWs were also randomly selected from the different wards where the new innovations are being promoted.

Interviews were done using semi structured interview guided by a checklist. The respondents were narrating their stories guided by the researcher. Data analysis was done by analysing the narrative stories and the observed farmer practices by grouping, sorting, editing and summarising.

From desk research there were many factors in transfer design influencing transfer of learning such as farmer participation during training, AEW to farmer coaching, farmer involved in planning, giving farmer feedback and farmer to farmer coaching.

The information collected from this research showed that Agritex to certain extent gave farmers some chance to participate during training especial in carrying out demonstrations, field days and during look and learn tours. The look and learn tours were appreciated by many farmers as they were saying they can learn much from by visiting other farmers. Feedback was not given as was expected by farmers and this was found to discourage farmers in practicing the trained innovations. AEW were mostly giving positive feedback to those farmers who had been found to perform better in practicing the trained technologies. Agritex should train AEWs on how to give feedback to farmers as this can improve the transfer of learning among farmers. Also it was found out that farmer to farmer coaching was not being done in training moisture conservation innovations.

Visual aids were used by extension workers during training, but their dirtiness and torn flip chart made it difficult for AEWs to effectively use them. Also the shortage of clear markers which farmers could clearly see aided the problem of using the visual aids to expected standards.

AEWs did not help farmers in coming up with their goals. Extension workers made blanket goals and objectives for all the farmers in training them. This was found to affect farmers in accepting the trained innovations. Extension workers should have group meetings where farmers can come up with their goals and objectives together. This can help in coming with objectives similar to those of farmers.

This study therefore shows where Agritex can further improve its training to improve transfer of learning in training farmers. The study gave some recommendations on training design which can help in the improvement of training for farmers to improve on practicing what they are trained.

Key words: Learning, Transfer of learning, Training

CHAPTER 1: INTRODUCTION

1.1 Background

Zimbabwe is a country with an economy which depends on agriculture. Generally, there are two main agricultural sectors which are the smallholder sector and the large scale sector. The smallholder farmers are found mostly in the communal areas where agriculture potential is low mainly due to low rainfall. Rainfall is unreliable and the frequency and intensity of dry spell has increased for the last ten years now (Twomlow, et al., 2008). The smallholder farmers are mostly affected as they depend on rain fed agriculture. The dry spells affects crop yields because the rain stops for some time at the critical period when the crops need moisture.

The Ministry of Agriculture, Mechanization and Irrigation Development (AMID) together with Non-Governmental Organisations (NGOs) are providing relief inputs of maize seed and fertilizers to smallholder farmers where the dry spells frequency and intensity are high (Twomlow, et al., 2008; Salam, 2011). This is to reduce the impact of the dry spells to the smallholder farmers as they cannot afford to buy maize seed and fertilizer for the farming season. However, because of inappropriate moisture conservation innovations, the relief inputs provided by the government do not improve in productivity and the smallholder income, suggesting that the input relief intervention does not provide sustainable gains, (Rohrbach, 2005 in Twomlow, et al., 2008).

1.2 Research Problem

In order to improve maize productivity in the areas affected by dry spell the department of Agricultural, Technical and Extension Services (Agritex) which is under AMID in Zimbabwe is training the smallholder farmers on new moisture conservation innovations. Moisture conservation innovations help in extending moisture availability to crops when there is dry spells during the growing period of maize crops. These innovations trained to farmers includes, agronomic practices mainly planting and weeding on time, keeping the soil covered with crop residues from previous season which will act as mulch and crop rotation.

NGOs, private companies, farmer unions, agricultural colleges and universities and research stations work together with Agritex in providing financial and material assistance in training the farmers. The stakeholders train Agritex extension workers who in turn train smallholder farmers or the other stakeholders directly train the smallholder farmers.

The main goal of the trainings is for farmers to practice the moisture conservation innovations they have learnt and therefore improve maize productivity. Every new innovation, inspite of its importance, has little or no value in improving productivity of any enterprise unless it is used or practiced by farmers. Again the innovations change has limited impact to the rural communities unless the innovations are appropriate to the farmers. However, inspite of the trainings and support by Agritex and other stakeholders there are little practices of the promoted moisture conservation innovations and low maize yields (Twomlow, et al., 2008). The assumption of this research is that, the failure of practice of new innovations by the farmer is not the shortcomings of the technology but rather the approach to the transferring of the technology and failure to acknowledge the farmer participation by extension staff.

1.3 Justification

The proverb, 'one can take a horse to the river but cannot force the horse to drink' is important. The literal meaning of this proverb is that one can direct a horse to the river but cannot make

the horse to drink the water if it is not thirsty. Therefore there is need to find out whether the horse needs water, how to make it thirsty or why does it not drink the water before one spent time and energy to walk the horse to the river. The same with Agritex training programs, extension workers need to find out what the farmers are thirsty for how they can be made thirsty to learn and to attend the training program.

The main goal of training is to transfer learning to farmers so that they apply the acquired knowledge and skills in their farms. So, the goal of training is not achieved until farmers practiced what they have learnt, (Caffarella, 2002). Elwood, et al.(2000) said 'that organisation aiming to improve their investment from learning or training investments must understands the factors that affect transfer of learning and then intervene to improve factors inhibiting transfer'. The government of Zimbabwe through Agritex is spending a lot of resources time and effort in training the smallholder farmers and there is aiming to improve its investments on new agriculture technologies.

Agritex as one of the main organisations in the innovations transfer, it is vital to have appropriate innovations which are accepted by the famers so as to improve maize productivity. The researcher is currently working within the department and is the provincial coordinator of the moisture conservation innovation and will be happy to see improvements in the transfer of learning of the trained technologies by farmers.

It is therefore important to question the way we used to do things always in which the transfer of learning happens as it affects the transfer of new innovations both within Agritex and at the farmer level. This therefore justifies why there is a need to identify the factors which affects the transfer of learning from Agritex to smallholder farmers so as to improve learning process.

1.4. Research objective

The main objective of this research is to contribute to improvement of learning processes in Zimbabwe by gaining insight into factors which affect transfer of learning on moisture conservation innovations trained to smallholder farmers by Agritex extension workers of Marondera district in Mashonaland East province.

This research followed the steps as stated below:

- Step 1: What does transfer of learning mean and what factors are of influence on it.
- Step 2: What could be the ideal standard of successful transfer of learning in a case like Agritex situation in Marondera district
- Step 3: What are the indicators to measure that success of transfer of learning in Marondera district?
- Step 4: What is the difference between the transfer of learning in Agritex Marondera and the set standard of indicators.

CHAPTER 2: LITERATURE REVIEW ON TRANSFER OF LEARNING

This section begins with a review of the definitions to help understand the concepts and also on the model of transfer of learning. This is then followed by the modified theoretical framework of transfer of learning and factors which influence transfer of learning.

2.0 Definitions and Models

2.1 Transfer of learning concepts

Transfer of learning is defined as 'the successful and ongoing application by trainees to their performance of jobs knowledge and skills gained by participating in training program. When transfer of learning occurs, it is in the form of meanings, expectations, generalisations, concepts, or insights that are developed in one learning situation being employed in others' (Merriam and Leahy, 2005).

Caffarella (2002) defined transfer of learning as successful putting into practice by trainees of what they learned by participating in a training program. For transfer of learning to happen trainees and all the stakeholders involved in the training process should have the skills of planning, translating, negotiating, adaptation and decision making. Transfer of learning is observed in behaviour changes that is, what is to be transferred can be seen in observable changes in knowledge, skills and attitudes. There is an assumption that when trainees knows what is to be transferred well in advance and how this will be accomplished transfer will happen with little or no interventions. However, this assumption is not true in some instances as transfer of learning is more complex than simply knowing the learning needs to be applied and to plan about it. The application of the innovations is considered to be multidimensional and complex and needs knowledge, skill, endurance and artistic.

Also, Ford and Weissbein (1997) in Ruona, et al. (2002) defined transfer of learning as the application, generalisation and maintenance of new knowledge and skills.

In this research the definition of Ford and Weissbein was adapted and transfer of learning is taking learning out of the training room or trial plots to the actual farm or the home. This research also takes the idea of Caffarella (2002) that application of innovations is complex requiring knowledge and skills. This has systems of influences which can hinder or support transfer to happen.

2.2 Learning

Gieskes and Hyland (2003) defined learning as a continuous process resulting in the increase and improving knowledge through processing information and adapting to changes in the environment. It is the acquiring of new or modifying existing knowledge, skill, and behaviour and putting it into practice. The organisation is considered as the entities of processing, distributing, interpretation and storage of information and knowledge.

Learning is the change in behaviour or potential behaviour that comes from experience and it cannot be seen but can be observed from the practices of the trainee (Rollinson, 2008). According to Pretty, et al. (2002) learning can not only come from formal training but from the

progression of developing oneself through experience. Training is therefore the creation of the learning environment where all participants are involved to share their ideas, views and experience. Pretty (2002) also suggested that for learning to be successful there is need to actively involve the trainees before, during and after training processes.

Race (2010) said that, 'it is the learners who learn'. Race went on to say that it is the trainees who do the learning for themselves, but the trainer only creates the condition suitable for the learner to learn called the learning environment.

Leeuwis (2004) talked of social learning in the rural communities where farmers voluntarily learn and it is connected with human interests and changes in professional practice. These are also adults who are into farming and other livelihoods activities. The learning is different from the classroom situation of teachers and students.

Adult learning is defined by Pretty, et al. (2002) as learning which is mainly informal and is not done under the school curriculum. Adults are voluntary learners if the environment is unfavourable they stop from learning. This is mainly based on participation of the trainees. For adult learning to be successful trainees need to be actively involved in the learning process.

According to Merriam and Leahy (2005) the goal of all learning is to make information useful, so that learning travels with the learner to the working area. In the working area, the learning is transferred and applied in novel, interesting, and innovative ways and this is referred to as transfer of learning. From the definitions in this research it is concluded that where successful learning is happening transfer of learning is also happening. The two concepts cannot be easily separated in reality and what affects learning also affects the transfer of learning.

2.3 Theoretical Models

In training farmers there are many factors which influence learning many of which lie outside the actual training program itself. Many researchers have come out with models on the transfer of learning. Baldwin and Ford (1988) in Merriam and Leahy (2005) came with a model composed three sets of factors influencing transfer of learning (a) professional /trainee characteristics including ability, personality and motivation (b) content and design of the training program and (c) the work environment which includes support and opportunity to use the new innovations. In developing a framework to find out the factors that influence transfer of learning Geilen (1996) in Lim and Johnson (2002) came out with a model similar to that of Baldwin and Ford which are training design, trainee characteristics and work environment characteristics. In proposing the matrix to analyse transfer of learning Broad and Newstrom (1992) in Merriam and Leahy (2005) came out with partners in the transfer process who are the managers, trainers and trainees. The partners can employ the strategies for transfer before, during and after training.

Also Hucynski and Lewis (1980) in Lim and Johnson (2002) in developing the transfer of learning model to show the relationship of the content of the training, individual motivation and work environment came up with three phases which are the (a) Planning stage where training needs assessment done and motivation initiation are done (b) the learning phase where delivery of instruction are done and (c) post training phase where management of the work environment is done to promote transfer of learning.

This research focused on the three factors of learning in Baldwin and Ford model which are training design, trainer & trainee characteristic and work environment. It also looked at the three phases of training in Hucynski and Lewis model planning, learning and post training. The reason

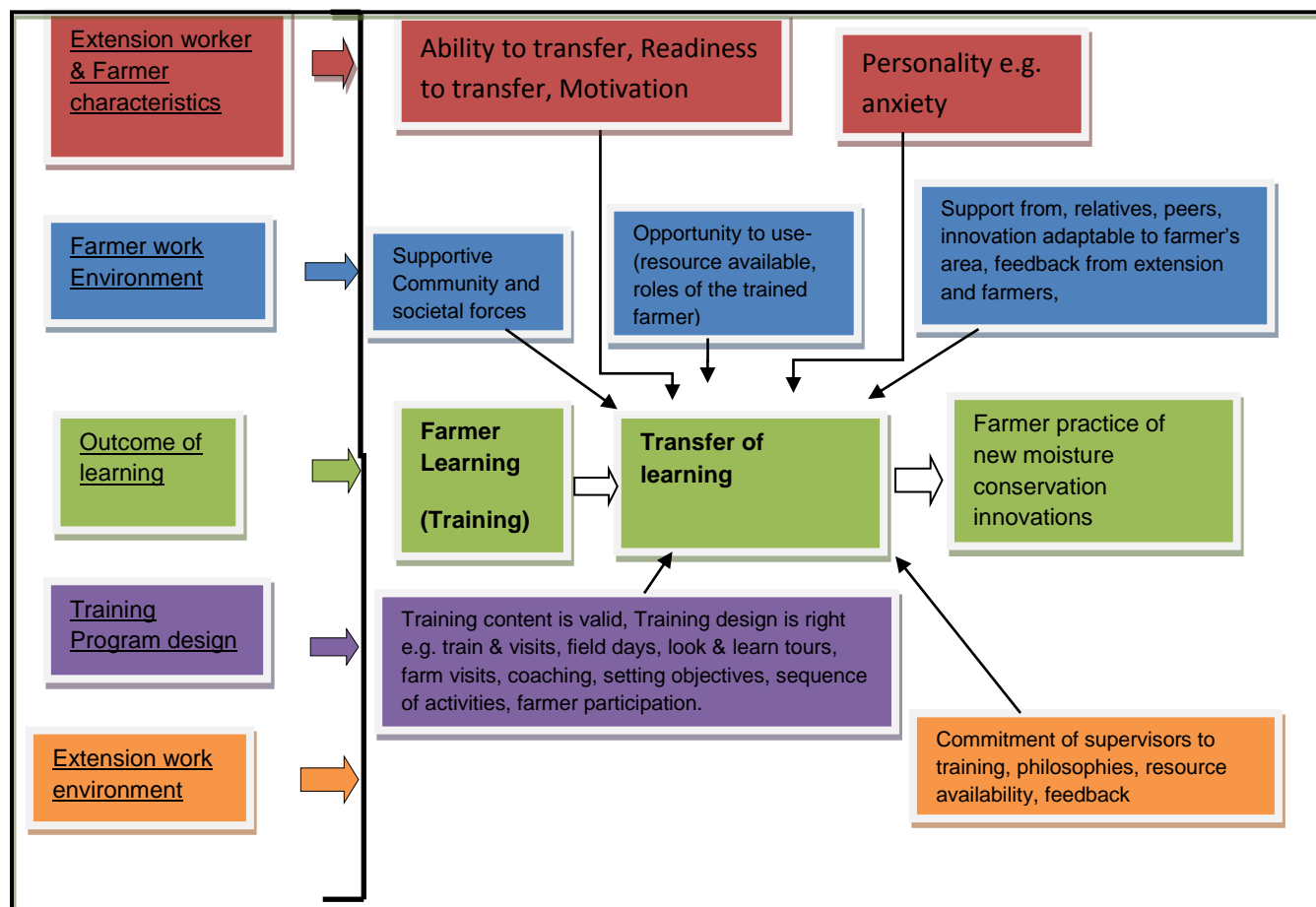
of considering the above factors is that even though learning can happen during the actual training the transfer of learning is influenced by what happens around the training such as the work environment, training planning and the character of the trainer and trainee. This therefore means that transfer of learning can be understood by looking at the whole systems beyond the actual training of the farmer and these are the main factors which influences transfer of learning.

2.4 Theoretical model for an ideal transfer of learning

This section describes the ideal situation where transfer of learning takes place in an optimal way, in innovations such as the moisture conservation case. This has been compared with other experiences of transfer of learning in other practical situations.

Basing on the models cited in Merriam and Leahy (2005) and Lim and Johnson (2002) as stated above, a modified theoretical model has been used as a model for transfer of learning on moisture conservation innovations. The model shows the factors that has influence on transfer of learning in Agritex department. The modification includes the change of the words so that they fit well with the situation of Agritex which is under the study of this research. Trainer and trainee characteristics were changed to extension worker and farmer characteristic respectively. The work environment is categorised into extension work environment and farmer work environment. The model reflects the thinking that the learning outcome (which in this case is the farmer practicing the moisture conservation innovation) is as a result of training the farmers who then transfer learning into their own farms. For this to take place the extension work environment, farmer work environment, extension and farmer characteristics and training program design influences transfer of learning. The extension and farmer characteristics that were identified to affect transfer include motivation, ability to transfer and personality such as anxiety to learn. The farmer work environment includes supportive community and societal forces, opportunity to use, support from peers, and feedback from extension workers and farmers. The extension work environments which also influence transfer are commitment of supervisors to training, support of the supervisors and resource availability. Training program design which includes the validity of the content and transfer design which are the instructional methods used also influences transfer. These factors influence the learning outcome by impacting on the farmer learning or trainings thereby hinder or support the farmer to practice the new innovation of moisture conservation. This forms as a guideline to the transfer of learning review in this research. This is as shown in fig 2.1 below. The colours of the figures show the factors which is under the main characteristic which influences transfer of learning. The arrows show the linkage to transfer of learning in the training process of farmers.

Fig 2.1 Modified model of Ideal transfer of learning.



Source: Modified from Elwood, et al., (2000)

2.5 Factors influencing transfer of learning

This section is looking at the factors influencing transfer of learning basing on practical experiences from different situations. Basing on the models of Baldwin and Ford's as stated in part 2.3 above and following the modified model fig 2.1 this section has the following subheadings; Farm work environment and Extension work environment, Training program design, Extension worker and farmer characteristics as factors influencing transfer of learning. Most of the books reviewed are research work published from year 2000 to 2010.

Learning has been looked at from many disciplines some of which are social psychology, adult education studies, innovation studies, policy science and complex systems thinking. This means the learning concepts covers different groups of people in societies, (Wals, 2009). In this review the focus is on the issues which deals with rural developmental and technology aspects of adult farmers in societal background rather than those at formal education settings.

2.5.1 Farm work environment and extension work environment

According to many publications work environment is one of the main factors influencing transfer of learning e.g. trainee opportunity to practice the new innovations, incentives to transfer learning, support from supervisors and social support and the climate of the organisation or the

working area. Opportunity for trainees to apply what they have learned is considered as one of the main factor in transfer of learning. The opportunity comes with the availability of resources at the working area (Merriam and Leahy, 2005). This means for the farmers to be able to transfer what they have learned there should be availability of resources such as seed, fertilizers, labour and implements for them to use. Farmers also need support from extension workers to motivate them by visiting their farms and observing and giving them support. When farmers have the desire to learn the extension worker has to initiate them to do or to practice what is to be learnt. Also extension workers have to encourage farmers by providing conducive and friendly learning and working environment for effective learning to take place and farmers cannot get discouraged in doing the work. However, Race (2010) said that 'doing alone is not a guarantee that learning has happened'. For effective learning to take place there is a need to make sense or think about what one is doing. This therefore means that farmers need to process information and turn it into their own knowledge. This can be done by brainstorming, problem solving and analysing situations. If this is not encouraged by extension workers it will reduce the transfer potential of learning.

For extension workers the work environment should be encouraging and motivating so that they do their work whole heartedly. This can be done by giving the needed resources to the extension workers such as the training materials and stationery.

Lim and Johnson (2002) on their studies on the trainee perceptions found out that the primary reason of transfer to happen was the opportunity to use the new innovations at their jobs. This was found to occur through program planning discussions, program development, information system design and instruction. On the other hand the factors which were found to hinder transfer of learning were that of lack of opportunity to apply the trained practices on the job, the information not directly related to the job, lack of understanding, lack of equipment to use for the technology and difficult to use the technologies at work places (Lim and Johnson, 2002). Similarly farmers, can fail to transfer learning for failure to understand the terminologies used during training by extension workers. Also the innovation might not be related to the farm working conditions of the smallholder farmers. The extension workers have to use terminologies which the farmers understand without some difficulties. However, extension workers find it difficult to translate scientific terms into local languages which farmers understand.

In another study to find the factors affecting transfer of learning it was found out that the management style and attitude of trainee's supervisor had significant influence in transfer of learning. Also work overload and crisis at work hinders the transfer. Other factors found to affect transfer of learning were information systems, reward systems, human resource practices, leaders mandate, departmental structures, measurement and control systems, lack of commitment by the supervisors (Clarke, 2002). For extension workers their supervisors should show commitment to the training and in supporting the trained innovations. This can be done by regularly visiting the training session done by the extension workers.

Gieskes and Hyland (2003) in their studies of learning barriers in continuous product innovation found out that, lack of resources that is time to meet deadlines, lack of budgets, lack of knowledge and capabilities hinder transfer of learning. Klein, et al. (2006) said that lack of resources such as time, materials and information affects learning as it reduces the efforts that results in motivation to learn. Farmers' motivation to learn can be reduced if they are not obtaining or purchasing agricultural input before the rain season starts. Also shortage of other basic resources such as food, clothing and school fees for their children reduces their

concentration to learning thereby reducing transfer. When farmers perceive barriers they become frustrated and lower motivation to learn thereby reducing the effort to transfer learning.

Support from managers, friends and family members was considered to be another key factor in transfer of learning. In learning processes supervisors provide a back up support throughout the process or they might not give the support. When the support is usual negative learners fail to find the importance of the subject and it will be difficult to implement what they learnt, (Caffarella, 2002). For farmers to learn and transfer their learning on new innovation they also need support from their relatives, friends, community leaders and the extension workers. Caffarella also argues that many learners need assistance in reflecting changes they must make themselves, before what they have learned can be translated into concrete results.

Social support in the work environment such as the trainee's beliefs about opportunities to use the knowledge, skills as a result of training and support from friends and supervisors have been found to have influence on transfer of learning (Clarke, 2002).

However, Fecteau, et al. (1995) in Clarke (2002) in their studies found out that supervisor support was negatively related to transfer of learning. But Clarke (2002) also said that the management style and attitude of the trainee's boss are important factors in supporting transfer while work load and crisis at work hinders transfer of learning.

2.5.2 Training program design

Lim (2000) in training design two variables were derived from many studies on transfer of learning and these are instructional design and instructional methods. The two variables are called the transfer design of training. Baldwin and Ford (1992) in Lim (2000) said that transfer of learning is maximised through instructional design when there are identical stimulus and response elements in training and transfer settings and when a variety of relevant training stimuli are employed in the training content.

On instructional methods Lim found out that teaching, explaining and coaching helps to support the transfer of learning. This help to deepens learning of the trainees. The trainees can explain what they have done to other students and it helps to process the information into their own knowledge. There are two types of coaching which are, peer coaching and one to one coaching. Peer coaching is where colleagues who work together reflects on the current innovations refine and build new skills and share the ideas and teach one another. The colleagues first have a meeting and discuss what is to be monitored and then observe and then another post meeting. For instance at schools teachers can observe ones lecture and then discuss it later. This was found to foster development among the peers committed to share their knowledge and encourages people to learn from each other hence improves on transfer (Beverly,1994; Sherman & Freas, 2004). This can be done by farmers when they are arranged into groups and observe what the other farmers are doing at their farms. They can record what to observe on the farm and discuss it later. They can also explain to other farmers what can be improved in the trainings and on the innovations. This can be planned by farmers together with the extension workers. Observing other farmers can improve learning and keep the innovations in their minds and use it in their own fields hence improving transfer. This will improve their understanding hence transfer of learning. Another type of coaching is when the trainer coaches the trainee on one to one level. In some studies it was found out that training which were followed by one to one coaching improves transfer of learning. In a study of 31 managers who were trained in managerial skills the author found out that training alone increase the managers productivity by about 22%, while coaching which included feedback, setting of goals, involving supervisors and practical increase their productivity by about 88% (Merriam and Leahy, 2005).

In this case the extension workers can discuss with the farmer after the training or on individual farm visits. This can be arranged by both the extension worker and the farmer. The extension workers can coach the farmers at their farms where they will involve their spouses giving feedback and practicing the innovations in their fields. The extension worker has to know the individual farmer's abilities and limitations at hand and how they can help each other to solve the problem so the farmer can learn new innovations. Visiting farmer's fields by the extension workers can support transfer of learning especially if they give positive feedback and also considering their plights. This is where the extension worker can coach individual farmers to practice the new innovation hence supporting transfer.

The research by Lim and Johnson (2002) on the influence of content on transfer of learning at work places found out that there are several characteristics which influence transfer of learning. The hindering factor of training design Lim found were: lack of sufficient time to preview the training content, lack of thorough needs assessment for each trainee, not enough practice and exercise session, lack of clarification of technical terminology. Lim and Johnson (2002) also found out that without strong match between the training and the trainee's work roles transfer of learning is hindered. The supporting factors were participatory learning method, use of visual material during training. Also trainer ability to coordinate in guiding the trainees with appropriate suggestions were found to be supporting transfer of learning and the training identical with the work requirements of the trainees (Lim, 2000) but the trainer has to understand the trainees' work environment. Also assigning the work roles that are related to the training content before, during and after training were found to promote transfer of learning.

Trainee participation during training was found to enhance transfer of learning. Trainees' participation can be improved through the use of visual aids during training. Visual aids make learning lively and improve the attainment of the training objectives and support transfer. They also help to explain complex ideas and capture attention of the trainees. Some of the visual aids which can be used include chalk boards, flip charts, handouts films and slides. Also the trainee should write neatly and legible and use bright colours which can be seen from a distance (Agritex training manual, 2006; Pretty, et al., 2002). In Agritex farmers can be made to participate when the extension workers uses the chalk boards, flip charts and hand outs to train farmers. This can make them to see what they are trained. Lecturing without use of some visual aids can be minimised to make them participate.

The planning of the training program should be done by the farmers themselves as this improves transfer. This will also help them to own the program than it is planned by the extension workers themselves. With farmers involvement in the planning program there should be an agreement that farmers lack certain innovation skills so that the extension workers then organise the training activities or courses directed towards transferring specific knowledge or skills. Training therefore is creating an environment where knowledge, skills and experiences are shared. Also training improves the skills, knowledge, performance and organisation results. (Leeuwis, 2004; Pretty, et al., 2002). The farmers should also be involved in the selection of the training date, venue and the topic to be trained as this encourages to select what is best of them hence supports transfer of learning.

Some research on training design suggests that the designed training should be similar to the transfer tasks and also that the training content should be consistent with job requirements (Elwood, et al., 2000). In a study to find out how training design affects trainees the author find out that students who were informed about the training in advance by the organiser outperformed other students to make decision during the training and they were observed to participate better. For farmers this can be done by individual visiting the farmers and inform

them about the training and its main goals. This can help them to think about the importance of the training and to search for other information before the actual day of training.

Giving feedback to trainees during training program improves transfer of learning. Positive feedback motivates the trainer and encouraged to do the work hence support transfer. Negative feedback affect negatively to transfer as it discourages the trainer and leads to less learning hence reduce transfer. In a research of students in studying aircraft landing skills, the researcher found out that those students who were given feedback during training were able to transfer their training to the real flying situation than those who were not given feedback (Merriam and Leahy 2005). According to Agritex training manual (2006) feedback gives knowledge of the results and guides the farmer in his or her own efforts. This is rewarding to the trainee and encourages further efforts and interests in practicing the new innovation. Farmers can also be given feedback during the training by the extension workers and from other farmers. This can be done by openly discussing with the extension workers during training and after training that is at individual farm visits.

The age of an individual may affect the hearing and sight of the person. The trainer should design training to allow for a variety of training approaches and strategies such as visual aids, discussions and demonstrations (Agritex training manual, 2006). This can improve the understanding and learning hence support transfer of learning.

For transfer of learning to be effective the extension workers should include in the program methods which encourage the transfer of learning. The methods should be implemented not only during training but even before and after the training programs. The content should be related to the farmers work environment and must be accepted by the farmer. For this to happen, the extension workers should include the farmers in designing the program and to find out the goals, expectations and interests of the farmers. Extension workers should not impose what to train farmers instead it should come from the farmers themselves. Studies have shown that where trainees set the training goals and objectives have a greater chance of transfer learning than when the goals are set by the trainers only. When the goals are set by the trainers the trainer or extension workers only facilitate learning so that the behaviour of the farmer changes contributing to their own goals and objectives. Farmers can set their own goals of the training with the facilitation of the extension workers before and after training. According to the Agritex training manual (2006) the objectives are set after training need has been identified from the farmers. The objective should describe what transfer of technology is expected and able to do at the end of the training. Lim and Johnson (2002) said that trainees with specific goals to apply learning at their job had a high chance of transferring learning than those without specific goals.

When training farmers the sessions should be timed so that they follow the sequence of activities in the field. For instance the digging of basins should be trained when it is time for digging basins. This avoids training farmers the technologies which farmers do not want to use in the near future as this discourages the participation of farmers during training. Also this avoids overloading farmers with too much information thus giving them time to take what they need at the right time (Farming for the future guide, 2009). From this review it can be concluded that transfer of learning is influenced by the factors surrounding training program design. Activities such as coaching, goal setting, and farmer participation during training and planning, feedback provision help to support transfer of learning by trainees.

2.5.3 Extension worker and farmer characteristics

Frazis, et al., (2000) as cited in Merriam and Leahy (2005) said that the motivation of the trainer and trainee influence transfer of learning. Giving the opportunity to provide input into the training decision will help improve the motivation of trainees.

Motivation to learn is the need or wish of the trainee to participate and learn the content of the training program. This is influenced by the trainer and the situational conditions of the training (Klein, 2006). This is the factor which influences the trainee to decide to attend to and persist in learning activities. Rollinson (2008) said that in motivation theory people chose a course of action which is influenced by ones expectations that results in profitable gains. There is a relationship between rewards and the effort one applies to the job. As farmers are adult they attend training voluntarily because of their expectation they will get from the training and this will influences transfer. Forcing farmers to attend trainings might not encourage the transfer of learning.

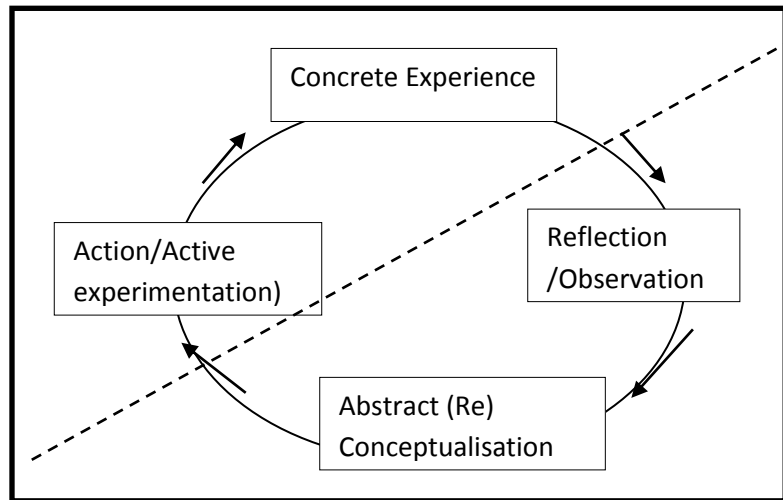
The research on the adoption of new innovations is also relevant as perceived hindering and supporting factors have been shown to impact attitudes toward and the use of new innovations. Attitudes toward the innovations are influenced by its alleged usefulness, ease of use, and availability of technical and personal support by the trainee (Griffith, 1996; Martins & Kellermanns, 2004 in Klein, et al., 2006). This also suggests that if the trained innovations to farmers are perceived difficult and not useful transfer of learning is limited.

Lim and Johnson (2002) in their studies of the influence of trainee's characteristics found out that those trainees with specific goals in their mind to apply their learning at work perceived a higher degree of transfer than those without specific goals. This was also found to influence the attitude of the trainee towards the trainer and the content of the training. Again technical competence effects were found to affect the transfer of learning. In their studies trainees with high level of technical competence and level of education scores of learning and transfer were higher than those with low technical competences. Learning does not always come from formal teaching, but it is also from the process of self- development through experience. Also many trainers do not give the needed attention to individual capacity of learning. The ability to learn is also encouraged by trainers. For learning to take place there is need to actively involve the learners. This suggests that the process of learning is more important than the subject to be trained. Extension workers and farmers have different personal experiences, diverse backgrounds and different motivational levels. Farmers need to be motivated by the program planners so that they can participate in training with their mind. The motivation will determine the farmers' personal characteristic in training and in transferring the learning in their farms. For extension workers to be able to execute their work perfectly they also need to be motivated by their supervisors through support.

2.6 Adult experiential learning model

Studies of experiential learning together with the concept of reflective practitioner are important issues to consider with regard to transfer. One of the models of experiential learning is the Kolb's cycle explained in Leeuwis (2004). The four stages of the cycle are concrete experience, observation and reflection, abstract concepts and generalisations and then testing the learning in new situations. Experience takes place as first step learning opportunity and is then reflected upon and the new learning or behaviour is then applied in new situation with the cycle. This is a continuous process as shown in fig 2.2 below. Conclusions drawn from the people's own experiences have greater impact than results formulated by others. The model therefore shows that learning occurs from a continuous interaction and iteration between thinking and actions. The model also suggests that learning can be improved by actively supporting the basic steps and translations that take place during the learning process and giving new opportunities for learning.

Fig 2.2 Experiential learning cycle

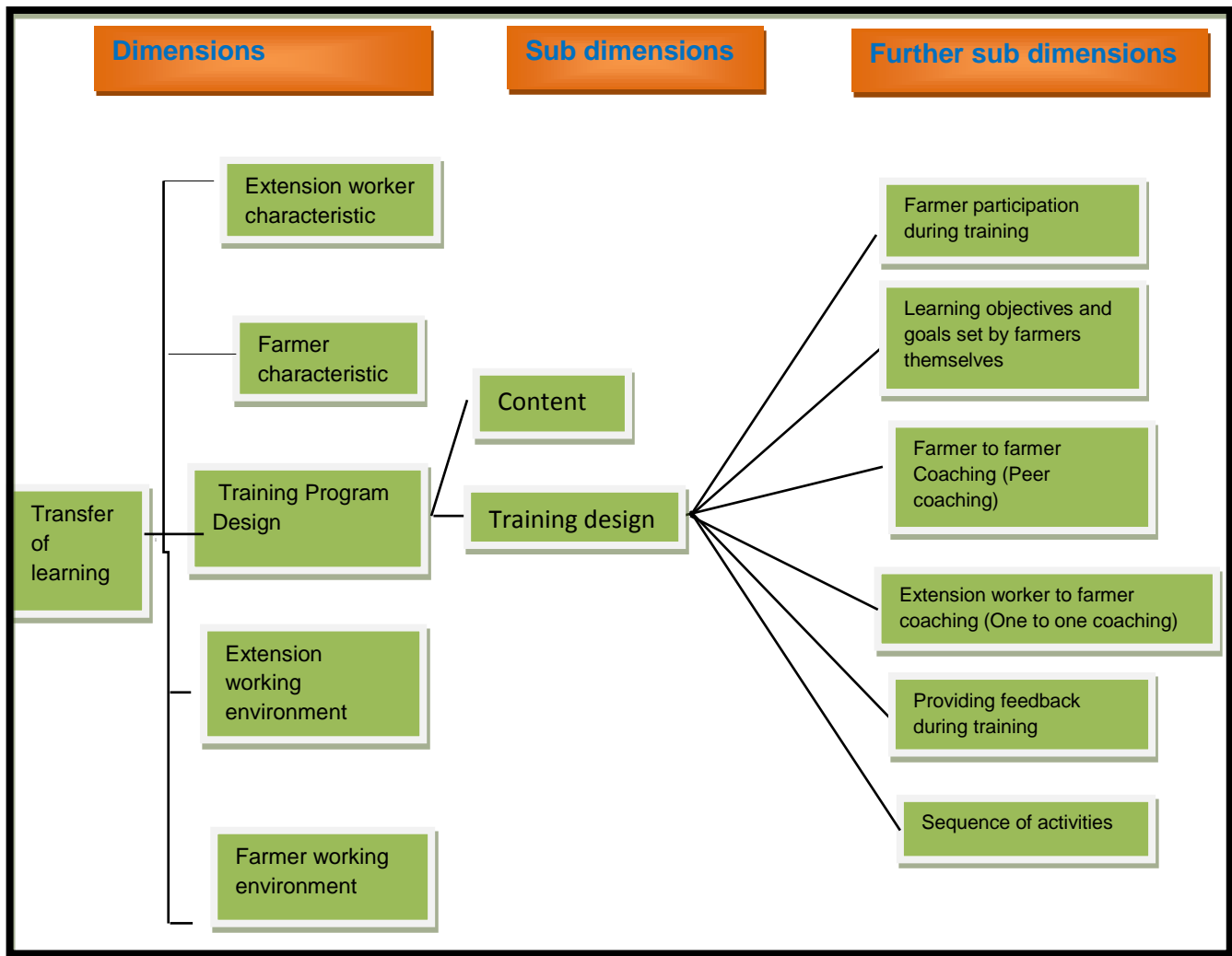


Source: Leeuwis, (2004)

2.8. Operationalisation framework

The literature review discussed on transfer of learning concepts and the factors influencing the transfer and models of learning forms the bases for development of the operational framework as shown in fig 2.3 below. This operational framework helped in the structural analysis of this research study. From the literature review factors influencing transfer of learning were observed and were categorised into four main dimensions which serve as an analytical framework for this study. These are farmer work environment, extension work environment, farmer/ extension worker characteristic and training program design. The training program design was selected to represent the sub dimensions which are content and training design. This is further categorised into the subdivisions which acted as indicators for this research. Training program design is selected as it is one of the main factors which contribute to transfer of learning in many organisations and this suggests that in Agritex it can also have great impact in influencing the farmers to practice the trained technologies. However, this does not underestimate other factors which influences transfer in impacting the farmers to practice what they are trained.

Fig 2.3 Operationalisation framework of the research basing on the literature review



2.8.1 Indicators of the research

This section explains the third level of the subdivisions of the operational framework in fig 2.3 above. These are the indicators which have been used to verify whether or how the dimensions are happening or not by observing and asking the farmers. Table 2.1 below shows the dimensions and indicators which explain the ideal situation of transfer of learning and how this can be measured. These have been used as standard measure of transfer of learning for this

research. In this research the terms peer coaching and one to one coaching as was used in literature review had been replaced by farmer to farmer coaching and extension worker to farmer coaching in that order. This has been done so that it suits the Agritex terms and situation which is under this study

Table 2.1 Indicators and means of verifications

Further dimension	sub	Indicator	Means of verification
Farmer participation during training		<p>Farmers to contribute their experiences/ideas during training and to make conclusion on their own.</p> <p>Farmers are asked and given chance to give answers during training.</p> <p>Training includes many methods of training such as group discussions, brainstorming, use of visual aids, plenary discussions.</p>	<p>Observe during training.</p> <p>Asking farmers what they had contributed in the past meetings</p> <p>Check the methods to be used in the training plan.</p> <p>Asking extension workers the training approaches used.</p>
Learning objectives set by the farmers themselves		<p>Training needs assessments carried out by extension workers and analysed.</p> <p>Check the training objective and the farmer's objectives. Farmers are consulted on the date to be trained, venue and what is to be trained. The goals of training are set by the farmers.</p>	<p>Observed by assessing the training needs reports.</p> <p>Observe by asking the farmers objectives and compare with the training objectives. Ask farmers to find out who selected the training date, venue and setting the goals of training.</p>
Farmer to farmer coaching		<p>Farmers given opportunity to monitor the practice of their colleagues. Meetings of what is to be monitored are done and then visit their counterparts. Also post meetings discussing what was monitored are done. Assignments of roles and then individuals are given chance to explain to others. Farmers can record what they have to observe and the explanations</p>	<p>Observe when farmers visit each other and what is discussed. Check in the farmers records what was discussed observed and conclusion drawn.</p>

	they did to each other. They can also include what conclusions were drawn after the post meeting discussions.	
Extension worker to farmer coaching	Extension workers can discuss with farmers after training and on their farms. The topics to be discussed are recorded. Farmers' limitations are also discussed and giving guidance and feedback on the practices.	This can be verified by the individual farm visits by the extension worker. Observed in the action plan of activities and asking the farmers. Also to check on the record books of extension workers with a list of farmers coached with their individual information recorded such as their limitations to practice the innovations and guidance given to the farmer.
Providing feedback during training	Open discussion with farmers. Non-threatening atmosphere: Farmers are invited to share their mistakes and without losing face. Success and failures are recorded and accessible to anyone else. Allowing the farmers to make mistakes and help to get constructive feedback.	This can be observed during training sessions. Check in the minutes of the meetings with farmers what was said and the feedback given. Asking farmers whether they receive constructive feedback.
Sequence of activities	Training activities should be in a sequence similar to the events on the ground. Personal action plan (what do I need to do before I apply the innovation.	This can be observed in the training planning schedule compared with the activities at the farms. What activities will you do between now and next month. Do I have to discuss with someone which crops are priority?

2.8.2 Main research question

In what ways does design of training program support the transfer of learning among smallholders farmers who participated in trainings in the case of moisture conservation in Marondera district supported by Agritex?

Sub questions

1. What training strategies or approaches are used by the extension workers?
2. How are farmers involved during the training?
3. How are farmers involved in planning the training of moisture conservation innovation?

2.9. Moisture conservation innovation

This section explains the moisture conservation innovations to help understand the scope of this study. The moisture conservation is suitable mainly in regions which receive very little rainfall

during the cropping seasons and for areas where the frequency of drought has increased so that crops can be seriously stressed by low moisture levels. Moisture conservation innovations help to improve the level of moisture in the soil thereby prolonging the availability of moisture to crops in the case of the occurrence of drought during the cropping season. Research has shown that where moisture conservation innovations are practiced the yield of the crops increases than where the innovations are not practiced. Again according to researches done the positive results of moisture conservation innovation are realised in the second to third season from where the innovation was first practiced (Farming for future guide, 2009). Moisture conservation innovation is different from the conventional farming practice which is mostly used by smallholder farmers in Zimbabwe. Conventional farming practice involves tilling the whole land which disturbs the soil thereby increasing moisture loss from the soil.

Some practice to follow in moisture conservation innovations are as follows:

Winter weeding

Winter weeding is the first step in moisture conservation innovations. This is where the farmers weed their fields as soon as they finish harvesting their crops around May to July. The idea of removing the weeds is that weeds remove the soil moisture from deep in the soils thereby reducing the moisture level in the soil which can be used by the crops in the following season. The implements which are used in weeding are hand hoes, machetes and slashes which disturb the soil as little as possible.

Planting basins/furrows

Planting basins are the holes which are dug using hoes during dry season from July to September. The basins should be about 15cm by 15cm by 15cm that is the length, width and depth. The holes should be spaced 75cm between rows and 60 cm within the rows. However, the spacing can vary a little depending on the amount of rainfall received in the region. The holes are dug so that they capture rain water and reduce its runoff. This improves the moisture level in the soil hence improves its availability to crops. The holes are dug by different implements such as hand hoes and the jab planter. Also farmers can make furrows along the field using ox drawn ploughs. The furrows are made in rows where planting is to be done. Both the holes and the furrows reduce soil disturbances which mean it reduces the loss of moisture from the soil.

Mulching/crop residue cover

In moisture conservation innovation the soil must be covered by mulch to at least 30% soil cover. This directly reduces the soil moisture loss from the field. The material used for mulching should be either the past season crop residue or grass litter which is brought into the field from the nearby fields. All these practices require labour than the conventional farming practice which does not require mulching. The mulch material needs to be protected where livestock are also part of the farming household as they feed on this material (Farming for future guide, 2009).

Crop rotation

Crop rotation is where the different crops are grown in the same field at different times of the season. This has great impacts in reducing moisture loss as different crops have different rooting depth meaning that they draw water from different soil levels. Even though crop rotation is practiced in conventional farming system in moisture conservation it is a must that the farmer should include a rotational system so that the innovation becomes complete set.

CHAPTER 3: AGRITEX DEPARTMENT

3.0 Background

This section explains about Agritex department on its structure and the management style. It also gives highlights on the approaches of training used by the department in training the smallholder farmers. The perception of Agritex on extension and training is also discussed in this section to make it easier to understand the scope of this study.

3.1 Organisation background of Agritex

Agritex is one of the government institutions which provide extension services to smallholder farmers in Zimbabwe. The aim of Agritex is to exchange and share knowledge, skills and ideas among farmers and extension workers so that farmers can make informed decision on farming activities. Agritex mission statement is that, 'Agritex will serve the needs of the farmers by generating, providing and promoting agricultural programs which supports competitive and economically viable productivity on sustainable bases'. Basing on this statement extension workers pay attention on the activities:

- (a) The development and management of water resources that contribute to the transformation of drought prone areas of Zimbabwe into productive and inhabitable lands, and enhancing food security and self sufficiency at house hold level.
- (b) The realisation of process of changing rural smallholder farmers from subsistence into commercial farmers by ensuring health families with sustainable economic growth.

To realise the activities as stated there is need for Agritex extension workers to understands and maintains professional ethics and standards and makes these guidelines part of the day to day conduct.

The mission statement and the activities help in addressing the Ministry of Agriculture Mechanisation and Irrigation department's policies of:

- (a) To feed the nation and achieve food self sufficiency at the household level.
- (b) To conserve the soil and water for use by future generations.

This can be done through training of innovations appropriate to smallholder farmers by extension workers.

3.2 District Agritex level

For the department to be able to implement the policies Agritex is designed to provide professional management at different levels in the district. At district office there is the District Agricultural Extension Officer (DAEO) and at ward level there are Agricultural Extension Supervisors (AES). The Agriculture Extension Workers (AEW) is the front line staffs who are in direct contact with the farmers. This structure provides a channel and linkage where knowledge, skills and new innovations are communicated to the smallholder farmers in a way that a relationship among farmers, extension workers and farmers is created.

The DAEO is responsible for giving guidance to the AES and AEW on the activities and the effective functioning of the department. Also the provision of resources are controlled and directed by the district heard of the department. On another hand the DAEO is held responsible of all what happens in the district and report to the Provincial Agricultural Extension Officer (PAEO) who is the head of the provincial office. Each AES has different span of control of the AEWs and ranges from 9 to 15 AEWs depending on the size of the wards. Table 1 below shows the number of Agritex staff in Marondera district.

Table 3.1 Number of extension officers in Marondera district

Level	Position	Number of staff
District office	DAEO	1
	AEO	3
Ward level	AES	6
Village level	AEW	76

3.4 Training and extension approaches

Agritex used different approaches in training farmers and these can be classified into:

- Group approach.
- Demonstrations.
- Train and visit
- Field days and competitions.
- Look and learn tour/ Exchange group visits

3.4.1 Group approach

The group approach is when farmers form groups and these are then trained by extension workers. This helps as extension workers can easily reach farmers where it is difficult and introduce the new innovations and even to introduce other agricultural related developmental programs. The disadvantages of these groups is that it is difficult to reach the needy farmers who are not in these groups as the extension workers only target those in groups (Mlambo, 2002). Extension workers perceive group extension as an important one as it is easier to work with and the farmers already knows each other. The group approach has the assumption that all farmers have the same problems and they work on homogenous farm situations. Farmers who are in the groups perceive Agritex as their friends whom they can work with as they are favoured in many cases when they are receiving free inputs from government and NGOs. But farmers who are not the members of any group are general left out and they are seen as laggard and poor innovators. Also farmers who are not members of these groups perceive Agritex and extension workers as outsiders who discriminate farmers because of being active in groups.

3.4.2. Demonstrations approach

The idea with the demonstrations is that they are problem solving, farmer oriented and interactive. It facilitates farmer to farmer linkages and also to extension workers and researchers. The demonstrations plots are initiated by the researchers while the monitoring at grassroots is done by the extension workers together with farmers. It focuses mainly on the smallholder farmer and is concerned about the use of local available resources and the use of traditional knowledge and skills. According to Mlambo (2002) the approach is more extractive of the resources rather than participatory. In setting out demonstrations extension workers start by

giving a lecture to the farmers after which they practice what they have been trained. This gives the farmer a chance to practice and try the trained technologies.

3.4.3. Train and visit

Train and visit is practiced to reach farmers at their door step and give them advisory services. The idea is to increase the effectiveness of extension workers by well planned training and delivery systems. The extension workers are receiving the research proven innovations from their supervisors through the agriculture officers at district offices. Extension workers then pass the recommended innovations to the farmers at village level who may send the messages to other farmers. The training and farm visiting are done to improve linkages between farmers and extension workers. Studies in Zimbabwe have shown that this was one of the extension approaches which was successful in irrigation schemes but was not successful in the rain fed farming systems. However, the program still lacks farmer participation as it is still following the top down systems. The top down approach results in irrelevant innovation being promoted. Due to limited resources few farmers were visited and these were the only ones who benefited from the extension workers. Again extension workers visited those farmers who are along the roads and those far from roads are left out. This was also called the 'tarmac bias' of professionals by Chambers (2005) when the author said that, 'professionals tend to visit those areas that are more accessible and areas near large cities which are more prosperous'. Also those visited are the farmers who are prosperous and do not need much assistance from extension workers. This means the poor and those who need assistance are left out without support.

3.4.4. Field days and competitions

Field days and competitions are organised in such a way that farmers are gathered at the farmer who have performed better than others in the community. This brings competition among farmers to practice the new innovations. Like the demonstration approach it also brings the opportunity of farmers to meet and share with researchers and extension workers. However, like the train and visit approach there is also a professional bias of visiting farmers who are accessible and prosperous in the community. Also the farmers are concerned about the food and not on the trainings being done. Again the approach is centred on the top down approach rather than the participation of the farmers. Farmers, extension workers and researchers view field days as days to feed and enjoy rather than the day of training. Politicians also use this opportunity to send their messages about their campaigns. Community leaders also take the opportunity to send their messages and announcements to the whole community.

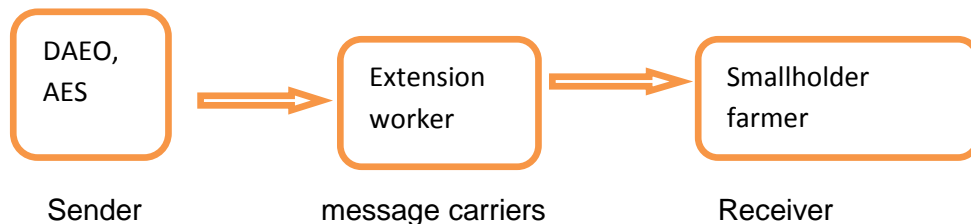
3.4.5 Look and learn tour/ Exchange group visits

This is where farmers visit other farmers or research centres who are training the topic to be trained. The host farmer is given chance to explain to the visited farmers what he/ she is doing in practicing the trained technology. The farmers have a chance also to see the real life situation of the technology. This method gives farmers an opportunity to observe and collect first hand information from the host farmer. Farmers are given time to ask questions to the host farmer and to get more clarification from the extension worker. In most cases such visits are not regularly done because they are costly and require much planning.

3.5 Agritex extension perceptions

Agritex extension workers to a certain extent are considered to be well educated by the Agritex department, who can shed some light to the smallholder farmers. On the other hand the farmers are considered to be living in the dark and need someone to help them. With this idea within Agritex the extension system of training farmers is like that of a teacher and student or a father child relationship. This therefore gives the definition of Agritex to be as a service which assists and shedding light to smallholder farmers through training, in improving their farming methods and giving them new innovation and increasing productivity and bettering their lives. This definition does not acknowledge that farmers have knowledge and skills which can be used to improve the level of knowledge among the farmers. This therefore means that the extension worker is only the messenger who should give information to farmers without listening to their contribution. The extension worker is the sender of information and the farmer is the receiver as shown in fig 3.1. below.

Fig 3.1 Agritex model of information flow



Generally the senders are the supervisors who are in authority as the researchers and officers at district offices while receivers are the farmers who in most cases are considered poor and uneducated. In most cases the senders controls the communication process and select what to send to the farmers. Even though there are some feedbacks from the receiver it is up to the sender to decide whether to accept or to reject the feedback. This model of information flow suggests that the extension workers are the message carriers or link between supervisors or researchers and the farmers.

CHAPTER 4: RESEARCH STRATEGIES AND METHODOLOGY

4.0 Study area and research methodology

This study was done in Marondera district which is under Mashonaland East province. Marondera district was purposively chosen because it is one of the districts where moisture conservation innovations are promoted by Agritex department and other stakeholders such as NGOs, farmer unions and private companies. Marondera ward map is as shown in Annex 4. The district has around 23 000 farmers altogether and about 13 000 are small holder farmers.

The research was done through a case study of Agritex department. A case study was chosen because it looks at in-depth rather than breadth of the research and uses checklist which consists of open topics that help to gather more data which causes the external validity of the results than a survey, (Verschuren & Doorewaard, 2010). The research was mainly qualitative, based on empirical data and literature.

4.1. Agritex organisational context

Agritex has offices at different levels that are at village level, ward level, district level, and at provincial level. Reports from the front line extension workers are found at each level of the offices. At district office there is the District Agricultural Extension Officer (DAEO) and at ward level there are Agricultural Extension Supervisors (AES). The Agriculture Extension Workers (AEW) is the front line staffs who are in direct contact with the farmers.

The offices keep the list of farmers who were trained by extension workers. These offices helped in providing information and documents of reports from the extension workers. The district office contributed to the design of the sampling methods because one of its mandates is to keep the list of farmers who are trained by extension workers, contact details, location and the farming practice of the trained innovations. Also the district office keeps the area planted and number of farmers practicing the promoted technologies of each ward in the district.

The main actors interviewed in this research were:

a. Agricultural extension workers

AEWs were interviewed in this research as they are the main players in training farmers on the new innovations of moisture conservations. The transfer of learning depends on their training approaches. They were asked to explain their training approaches and strategies used. Also their training session were observed. Extension workers training preparations and documents were also thoroughly observed to gather more information.

b. Smallholder farmers

Farmers are the main clients of Agritex and moisture conservation innovation trainings are done for them to practice and to change their behaviour of their farming systems. Farmers were asked how they were involved in the extension program and how they participate during training. Farmers' behaviour during training and their farming practices were observed after the interview. Further questions and clarifications were asked during observation.

The number of respondents interviewed is as shown in the table below.

Table 4.1 Number of respondents interviewed

Respondents	Number	Remarks
AEW	3	These are the front line extension workers who are in direct contact with farmers
Smallholder farmers	6	These are the farmers who attend training on moisture conservation innovation
Trainings	63	Three training session observed with different number of farmers as (a) 23 farmers (b) 21 farmers (c) 19 farmers

Three extension workers were randomly selected from different wards where moisture conservation technologies were promoted. Extension workers were selected on condition that he or she had a planned training schedule on moisture conservation during the period of data collection. Three AEWs were selected as the researcher was to spend two days with each AEW interviewing and observing the training preparations and looking at their documents. The selected extension workers 2 were male and one was female. However, this research does not consider the influence of gender in training farmers.

Six farmers were randomly selected from the list of the trained participants from the district office. The farmers were selected from the wards of the selected extension workers. The farmers list were numbered and then put in a box and then drawn until six farmers were selected. Of the 6 farmers selected 4 of them were female and 2 were male.

4.2. Data collection and analysis

A checklist was developed for both farmers and AEWs and was pretested in the study area where moisture conservations were promoted. This was to be certain whether all the questions to be asked were understandable to the respondents and to be able to collect data which can be qualitatively analysed. After pretesting, the checklist was adjusted at some areas where it was not quite clear to respondents.

Data was collected through semi structured interviews and planned observation with a checklist as shown in Annex 1 & 2. The researcher conducted the interview of all the respondents except for the AEW's supervisors for fear of anonymity. The main objective of the research was explained to the respondents before the interview. Three training session were observed in progress and data was collected from the observed trainee farmers. The researcher also participated in the training as trainee.

Individual farmers were interviewed and then observe their farming operations and duties for 2 days in order to get in-depth information.

During observations some notes were taken as main points and the detailed narratives were compiled after the observation. In observations the researcher participated in the farm activities and duties such as making basins and applying mulch.

Personal experiences of the farmers and extension workers with incidents of what happened during farmer trainings were used. Respondents were asked to narrate their success stories and failures of the trained innovations.

Literature review was done through desk study and forms the basis of secondary data of this research. The sources are from the digital library, books, and journals, annual and monthly reports of the Agritex department.

A qualitative data analysis was done. The data collected from the field was first grouped, sorted, edited and summarised. The differences and similarities in the responses were noted. The findings were then compared with the literature review on factors affecting transfer of learning. Conclusion and recommendations were then given in relation to the findings of the research.

4.2 Limitations of the research

Despite the researcher having a planned itinerary for farm visits, during data collection, this was changed at some point because the vehicle which was used for field work was being used for other business of the department as it was a pool car. This forced the researcher to work during the weekend to be able to cover all the planned visits. However, this time was used for desk study research where some departmental books were used for literature review and starting to group some of the collected data.

CHAPTER 5: RESULTS

This chapter presents the findings of the research results from the interviews with farmers and AEWs. The results were also from observing the AEWs training preparations and actual training sessions. Also the results were from observing the farm activities of the interviewed farmers. Documents and reports results from both farmers and extension workers were used in this research. Farmer's transfer of learning was considered to be effective in cases where there was evidence of whole or partial practice of moisture conservation innovations as explained in chapter 2 section 2.9. The following were farmers and extension workers who were interviewed in this research. Farmers: Mrs. Paudhara, Mr. Mangena, Mrs. Mutomba, Mr. Nyabonda, Mrs. Chimusana, Mrs. Tambudzai. Extension workers: Mrs. Chingonzo, Mr. Gore, Mr. Dzvete. The main headings of this chapter follow the sequence of the Operationalisation framework fig 2.3 sections 2.8 of further sub dimension. The headings are; farmer participation during training, learning goals and objectives set by farmers, providing feedback during and after training, farmer to farmer coaching, extension worker to farmer coaching and sequence of activities.

5.1 Farmer participation during training

The AEWs who work in direct contact with farmers are either certificate or diploma holders from agricultural colleges. In training farmers on moisture conservation innovations, AEWs used different approaches and strategies which were designed to improve transfer of learning. The training approaches were; demonstrations, individual farmer visits, exchange group visits/ look and learn tours and field days. The training environments were found to be friendly and conducive for farmers to learn. All the approaches were found to be used in all the visited wards.

a. Demonstrations

This approach was used at demonstration plots for groups of farmers to train them on new moisture conservation innovations. The AEW initiated and together with farmers set out demonstration plots at the farmer's field. Sometimes the selections of the field were initiated by NGOs and private companies who supported moisture conservation innovations. In most cases the demonstration plots were set along the road for other farmers to observe the results of the demonstrations. When the demonstration plots were set, the new innovations were trained at all the different stages of the innovation. The concepts and practice of moisture conservations were demonstrated by the extension workers while farmers observed and then gave instructions to farmers for them to practice. This method showed how farmers used different implements in making basins and how the basins were made and how plantings were done. Extension workers supported the demonstration approaches as was commented by Mrs. Chingonzo (AEW who joined the department in 2004) and the comments were similar to other interviewed AEWs;

'We demonstrate to farmers the new innovations for them to see how the innovations are done. After that we ask them to practice what we have demonstrated to them. Theory, theory without practice does not help'.

Also farmers were found to appreciate the approach where extension workers demonstrated the new innovations to farmers. This was echoed by Mr. Nyabonda (a young farmer trainee on moisture conservations);

'AEWs are doing true 'chidhomeni' because they showed us what we are supposed to do in the field and we are asked to practice it ourselves. 'Chidhomeni' is a derivative

word from demonstration meaning extension method used by extension agents to train farmers by demonstrations on their farms and then asked to repeat what they have seen and repeat it on their own farms.

Mrs. Chimusana who is in her early forties and has been farming since she was married 20 years ago, had the same sentiments and it was the same with all farmers interviewed.

'These demonstrations help me as I cannot read and write. I am able to observe and practice exactly how the innovations can be done. This makes it easier for me to follow and do the same at my own field. I am also doing exactly, the same in my field as this program has increased my yields compared from the past where I used to plant without applying some mulch'.

In one of the observed training session farmers were applying some mulch as shown in fig 5.1 below. This was found to be the same in all the three wards of the research.

Fig 5.1 Farmers working at a demonstration field



During training at demonstration plot sessions farmers were asked by AEWs to explain to others what they have done. Some farmers said they did not find this easy as Mrs. Paudhara (65 years old and has been farming since her teenage days);

'Extension workers of these days gave us a lot of work to do and we do not have rest when they are training us. I do not understand why they have changed from the old extension system where the extension workers used to show us what to do with little work to do. I am old and cannot afford to do the work and answer their questions which they always ask. This is good for school children not us as we are no longer active enough to do the different exercises'.

Also Mrs. Chimusana said,

'AEWs always ask questions which are difficult to answer. This needs young children not us'.

In one of the observed training session the extension worker asked farmers the following questions:

- a) What challenges are you facing as farmers when applying mulch on the field?
- b) Which time of the year should we start applying mulch in the field?

Farmers gave different answers and some were written on the flip charts and some were not. Of all the 23 farmers who attended the training 15 contributed in answering the questions but the other 8 never attempted to give any contributions to the asked questions neither did they ask anything to the AEW.

Visual aids and writing notes

In all the observed training sessions in the three different wards AEWs were found to write some notes on flip charts and portable chalk board. However, the flip charts and the portable chalk board were dirty and not quite clear for farmers to see. Also some farmers were without books and pens for writing some notes. This is as illustrated in box 5.1 below.

Box 5.1

Mrs Chingonzo said that, *you need to bear with me as there are shortages of stationery at my work place; I struggled hard to get only this single one. You know that in the last training we were not even having these flip charts to write, so this is a great achievement.* (This was met by a great laughter from farmers.)

When farmers were still laughing some shouted from the back seat saying, *'the red marker you are using is not clearly seen from this end'.*

In another training session Mr. Gore (who started working as an AEW since 1998 in Marondera district) asked farmers to take notes which he was writing on the dirty and tattered flip chart with a marker which was not writing well. About half of 25 farmers who were present, said that they do not have books and pens as they were not able to buy them. Some said we cannot afford to buy stationery for our school children and for ourselves as well. When the AEW was still talking there was a shout from the farmers that, *'the pens and books have been taken by school children'.* Some said *we cannot afford to buy stationery for our school children and for ourselves as well.*

As for leaflets and handouts all three AEW said that, they were not receiving enough handouts and leaflets to give their trained farmers. The few handouts they sometimes received were in English language, of which most farmers do not afford to read without help. The few handouts and leaflets were from NGOs and other private companies who sometimes work with them.

Showing results of the innovations

Through demonstrations, field days and exchange visits farmers were shown the positive results of moisture conservation innovations. This was supported by all the three interviewed AEWs and Mr. Dzvete (an extension worker for the past seven years);

'Farmers want to learn by seeing the results not just talking. They are like, Thomas in the bible who believed by touching' (referring to the bible story, when Thomas believed the resurrection of Jesus by touching His wounds.) *Also, our head of department likes us to set demonstrations for farmers to see and they always encourage us to set them along the main roads for many farmers to see'.*

All six farmers supported the idea of learning by observing the positive results of the new innovations. Both Mrs. Tambudzai (one of the trainee farmer on new moisture conservation innovation) and Chimusana had the same thinking.

'We have seen ourselves the true results of moisture conservation innovations on field days and at demonstration plots in the village. This made us believe that the innovations actual works and is worth practicing'.

b. Individual farm visits

The extension workers visited some farmers they trained on moisture conservation innovation. During visiting farmers they encouraged them to practice the new innovations. They also

observed what they were doing and gave them advice on their work. They also discussed their problems and how they can be solved.

All interviewed AEWs said that they visited some trained farmers but they have some limitations as Mr Gore explained in box 5.2 below

Box 5.2

'After training farmers I visit them individually on their farms to see whether they are practicing the new innovations trained and to find out what their problems are. Farmers appreciate a lot when you visited them as this can be seen by the care they always gave us during our visits. Also by visiting the farmers you notice different methods of farming the farmers are using and we learnt also from that. You also can discuss their problems face to face and in their own fields and it help a lot. However, the limitations in visiting the farmers are that, we do not have motor bikes to cover all the farmers who are trained. Some farmers stay very far away from my compound (He was pointing to the other village which he said is under estimating it to be around 8km from his office). Also it is impossible to visit all the 90 farmers that, I train on moisture conservation innovations that are all over the villages because of pressure of work. This season I have managed to visit only 5 farmers out of the total 90 farmers who attend my training.'

The strategy in visiting the farmers is targeting opinion leaders who are active and talkative so that other farmers can learn from them as it is impossible to visit all farmers. This helps as they can teach other farmers and have confidence in what they will be doing.'

Fig 5.2 below shows one farmer's practice. The farmer was applying anthill soil to his field. This she said it helps to improve the moisture holding of the soil.

Fig 5.2 Farmer applying anthill manure



Mr Dzvete had the same opinion in his story.

'You know that our work is to visit farmers, we have trained and find out whether they are practicing what we have trained and to collect information to report to head office. But because some farmers stay far away from my homestead and it is difficult to travel all the distance on foot. My motorcycle is no longer functioning well and the department is not paying arrears for maintenance and other operations costs of the motorcycle. When we ask our supervisors for the maintenance of our bikes they always said that their budget do not includes motor bikes maintenance but still they told us to try our means to visit farmers on their own farms. This makes me wonder how I can manage to visit all farmers on foot.'

This was also supported by Mr. Mangena (who is in his late twenties and has started farming after finishing ordinary school level twelve years ago) and this was similar with the other 4 interviewed farmers.

'The extension worker occasionally visited our farm. During the visit he used to ask us why we were not practicing the new innovation and this has made us to start practicing the moisture conservation innovation. Nowadays the AEW is encouraging us to increase the area under the new innovations. The AEW always correct us when we made mistakes on the new innovations. I started to plant maize on a small area of about 0.2 of a hectare. After realising the increase in yields I increased the area under this technology to about 0.8 of a hectare. My plans are to continue increased the area to cover my entire field'.

However, one farmer said that since she started attending the training program three years ago no extension worker has visited her farm. She had a feeling that maybe it was because she was not a good farmer compared to those who are mostly visited by AEWs. She also suggested that maybe it was because she was staying far away from the AEW's homestead.

c. Field days

Farmers together with the AEWs arranged field days on farms that have performed better in practicing new innovations. Farmers had chance to observe personally the new innovations. The host farmer were given time to discuss and explain how he/ she has managed to practice the new innovations to other farmers. Some pictures of the trained innovations were displayed along the field. Questions were asked about the new innovations by other colleagues and given time to answer the questions. However, not all trained farmers were given enough chance to observe the displayed results as Mrs. Mutomba explained and this was supported by 3 other farmers interviewed;

'Every season there are many field days which are held by extension workers but they select farmers who have performed better than us. However, I always attend as they select me to prepare food for the people. This is because at field days there will be many people, farmers, school children and teachers, politicians and many others. These people need to be fed and there is no time to look on what the farmer has done.

However, the other 2 farmers viewed field days as the time when people had time to share new ideas and learn from one another as was commented by Mr. Mangena

'Field day is a time when we meet with many people from different areas and we enjoy sharing ideas and eating together with them. Again this is the time we are given announcement by our traditional leaders and politician of the issues in the village and they also encourage us to practice the new innovations'.

All interviewed extension workers said that it is mandatory that every year extension workers should hold field days for farmer to see what they have done as this is one of their key result areas. Also the supervisors encourage them to invite other respected persons from the ward for them to see the work done by extension workers through field days.

One field day program for last season was seen among the files of one AEW. This was as shown in table 5.1 below.

Table 5.1 Field day program for last season on moisture conservation innovation

Time	Topic
8.00 - 8.30 am	Arrival of farmers
8.30- 9.00	Introductions
9.00-10.00	Tour of the farm
10.00-10.30	Host farmer explanations and discussions
10.30-11.00	Question and answer sessions
11.00 -11.30	Guest speaker (MP
11.30-12.00	Entertainments (songs, poems, drama)
12.00-12.15	Announcements
12.15- 14.00	Lunch and departure

The program showed that farmers had a chance to tour the field, observing what the host farmer had done. They also had time to ask questions to the host farmer and discussed them. Entertainment and lunch were also part of the training program.

d. Look and learn tours/Exchange group visit

This research has found out that farmer groups from different villages trained on the same innovations visited each other. The arrangements were done by the extension agent together with the farmers. One group was introduced to another group and then given chance to explain and discuss the innovations they are doing and how they were doing it and how they deal with problems they are facing. The date and the topics to be discussed were also planned by the farmers. This was conveyed to the other group before the exact day of visit. All 6 interviewed farmers appreciated the idea of visiting other farmers such as by Mrs. Paudhara when speaking to the researcher, as illustrated in box 5.3:

Box 5.3

'My son, ruzivo moto unogokwa (Knowledge is like fire: you borrow from your neighbour) and chitsva chirimurutsoka (new things are learned from travelling to other places) (These are two local language proverbs meaning one can learn from others by asking them and when you travel to their place.) This was a nice experience because we saw what other farmers are doing...and what challenges they are facing in moisture conservation innovations. I felt sorry for those who failed to attend the discussion because they were from a distant. They could not afford to walk all the way from the far end of the ward. It is good if these visits can be regularly arranged by the extension worker as we can learn from them. You see (pointing at one of the planter in the verandah used on moisture conservation) I was given by the farmer because he is my niece. He was happy when he saw me visiting him during the exchange group visit. In future I will not be absent for any planned exchange visits in this ward'.

Sometimes farmers visited research centres or institutions that have specialists in the topic to be trained. Farmers arranged to visit research centres themselves but were helped by the

extension worker. During training observation of Mrs. Chingonzo the group of farmers arranged to visit Kushinga Phikelela on the 3rd of September 2011. The farmers came out with the date of visitation and the expected topics to be discussed during the visit. Kushinga Phikelela is one of the Agricultural Colleges in Marondera which train school graduates on Agricultural innovations. This was found to help many farmers as *Mrs Chingozo said,*

'This is helping the farmers a lot as I am seeing an improvement in the participation of farmers since we started these visits last season. However, the visits are not frequently done due to financial limitations'.

Poems and drama

During training farmers were encouraged to do dramas and poems to lure other farmers to practice the new innovations. The poems and dramas were done at field days, demonstrations or at other functions. In one of the observed training sessions one of the farmers was given time to recite his poem. The poem was encouraging farmers to work hard and practice new innovations from AEWs. The poem disparages some farmers who were labeled 'laggards' as they were not taking up new innovations. The poem is in box 5.4 below. The poem was recited in local language which was understood by the farmers.

Box 5.4 Poem

What as Farmer are you doing?

What, you laggards, who do not want to see the hoe, the one who always wait for sun to set. The one who is not happy all day long. If greeted you do not respond. What wrong doing have we done. You always say we have magic for farming, but you do not attend trainings, you do not practice new learned innovations, you do not work on your farm.

But we urge you to look for new innovations from AEWs, When it start to rain that is when you start to farm. That will be too late. You should start to work early enough. Make hey when the sun shines, a stitch in time saves nine.

You thought we were playing when we attended training with AEWs. But you listened not, now we are following the intelligence of the AEWs and reaping the rewards. And you start asking where to start and what to do? If you do not learn how to cook you die with hunger. We now have the knowledge on new innovations, and it is now the weapon to destroy poverty and hunger.

The poem was done to encourage farmers to practice new innovations trained through AEWs. This was echoed by all AEWs interviewed as Mrs. Chingonzo and Mr Dzvete illustrate in their statements as illustrated in box 5.5 below

Box 5.5

'Poems encourage farmers to realise that they have to work hard and accept new innovations. This is because we have other farmers who do not want to work on their own farms. They spent most of their time drinking beer while their children do not have something to eat. I have seen the poems working a lot as we are seeing many farmers coming to my trainings. Even though there is no clear evidence that poems and dramas are luring farmers to come to my training I believe their powerful message is contributing farmers to attend and accepting the new innovations. Poems and dramas are a spice to our trainings which are not always attractive to farmers. This can motivate farmers to attend and to practice what we train them'.

In one of the AEWs observations a training timetable was observed in between a stuck of files and is as presented in table 5.2 below.

Table 5.2 AEW training timetable

Time	Objectives	How	Material to be used	Evaluation
10.00-11.00	Land preparation (digging basins, furrows and ripping)	Lecture, discussion, demonstrations, practical	Flip chart, hoe, ripper,	Questioning
Break				
11.20-12.00	Land preparation (digging basins, furrows and ripping)	Practical	Hoe, ripper	Farmer monitoring
12.00-13.00	Recall and explain the best method to use	Discussion, questioning, note taking	Flip chat, handout, notes	

The time table was dirty and tattered. There was no date to show when it was used. However, after asking, it was found out that the AEW always refer to this program when doing some training. The time table shows that, farmers participate during training through discussions, practical and answering questions. It also shows that flip charts and hand outs were used. All the three AEWs were found to be using similar strategies in training farmers.

5.2 Learning goals and objectives set by farmers

This study has shown that, in many training occasions, AEWs were the ones who were coming out with the final objectives for their training sessions on new moisture conservation innovations. There were of the belief that farmers cannot afford to make useful objectives as was noted from Mrs. Chingonzo;

'Mostly it is not important to let farmers make the training objectives as some of them are not able to read and write. Moreover, they do not know what we need to train them so we just do everything for them'.

Some of the farmer objectives and goals were the same with the AEWs training objectives. However, it was found out that AEWs were not helping farmers to come out with their objectives. AEWs set their training objectives directed by their supervisors. This was the same with all three interviewed AEWs.

'we set our goals and objectives basing on the directives of our supervisors if one do not meet the objectives set by your supervisor you get into the black book of the department meaning that one has to follow what is set by your supervisor failure of which you are considered a laggard. The department of Agritex does not punish anyone as long as one meets their needs such as following the objectives of your supervisors'.

From all three AEWs none was found carrying out an individual farmer training needs assessments. Mr Gore and Mr. Dzvetse said,

'We do not have time to carry out an individual farmer training needs assessment. But we observe the farmers during their farming operations at field days and on demonstration plots. These needs we generalise them for all the farmers whom we train on moisture conservations. If we carry out an individual training need assessment there is no time to preview all of them because of pressure of work'.

In checking the reports of the training needs assessments from AEWs, there were no reports on training needs assessments.

It was also found out that farmers attended training for different reason as Mrs. Tambudzai explained;

'I attend these training because my husband asks me to attend. During the farm observation after the interview, Mrs. Tambudzai was found to be a vegetable vendor at a nearby shopping centre. When asked her source of livelihood, she said that, I am able to feed and send my two children to school through vegetable selling. My husband is the one who is concerned about farming not me'. She also said that, her husband always sends her for training to get free inputs when they come from government.

This is also what Mr. Gore said:

'Some farmers attend our training so that they can easily access agricultural inputs when they come through government funding'.

Five of the interviewed farmers pointed out that their main goals is to have enough food to eat with their families and if possible to have extra for the following season or some to sell. They believed that the shortage of food in their area were shortage of rain which has increased these days. This is what Mrs. Paudhara had to say,

'In this entire village what people want is to have food enough for their families. If one gets extra then one has to thank God for that. We used to have good harvests in this area.....and what has caused this suffering is the shortage of rainfall which we thought is punishment from God'.

However, one farmer believed that the main cause of crop failure was due to shortage of inputs such as fertilisers and seed. Mrs Tabudzai had this belief'

'What people are saying that rainfall is the cause of food shortage is not true. The main cause of crop failure is the late delivery of agriculture inputs to farmers by the government. If you want to buy them you cannot afford as they are very expensive. People do not have money to buy these inputs. I have seen this because my husband always fails to get the right variety to grow in this area. He also struggles to get buy fertilisers to use in his crops'.

In planning for other activities such as field days, exchange group visits and selection of some demonstration sites farmers were involved. The date and time of the day for the activities were decided by the farmers themselves.

Mr Gore narrated in the box no. 5.6

Box 5.6

'I know that moisture conservation innovation is a method with several innovations or components involved. Due to that fact, I know there are many practical skills needed to effectively train the farmers. This makes me want to involve farmers in every stage of planning so that they make their contributions. I also involve them in planning of other activities such as selection of venue, date and time of training. Also the selection of the person to host field days and the date is done by the farmers themselves. If you do everything for them you meet a lot of resistance from farmers and that is why we are letting them sometimes to decide for themselves. Nowadays we are now using participatory approach where we involve every farmer rather than the old method where extension worker used to decide and does everything. Through participatory approach we make the farmers' brain to work not to be dormant. This is what we were taught during our participatory workshop last season.

5.3 Farmer to farmer coaching (peer coaching)

According to their responses in individual interviews, farmers stayed far away from each other and did not have planned coaching on each other. Mrs. Mutomba who has been farming since she was married ten year ago said that,

'I stay far away from my colleagues and it is difficult to visit each other without some reasons. When I visit my colleagues maybe it will be during a funeral or when I want to borrow some seeds or food items for my family'.

Mr Dzveti had the same sentiments when he said that;

'It is very difficult to arrange for farmers to visit each other and observe and then discuss the operations of their colleagues as they stay far away from each other. Our farmers are not like those from the developed world where everyone has a vehicle to use when travelling long distances. They can only visit each other when they have something they seriously need such as food or during a funeral'.

5.4 Extension worker to farmer coaching (one to one coaching)

After observing documents and reports of the AEWs farm visits, there were no documents with clear topics discussed and the information of the individual farmers. Again soon after training session, AEWs were found to discuss with some farmers however, the discussion were not planned for coaching. It was found out that farmers were asking AEWs for clarifications on the trained topic. They were also heard to be talking on certain social issues not related to the new trained topics. On individual farm visit Mr. Gore and all the other 2 AEW supported the statement below.

'We cannot afford to visit all the farmers due to transport problems and we do not have stationery for recording each individual farmer report. We cannot afford to regularly visit each farmer and explaining him/her the new innovations. We only select few farmers for visitations. Also our main aim of visiting the farmers is to find out what they are doing and encouraging them to practice the new innovations'.

Mr Dzveti added that;

'Our supervisors encourage us to only visit those farmers who are local leaders, opinion leaders and those who are talkative in the community. This is to make sure that they will support you in spreading the trained technologies'.

5.5 Providing feedback during training

AEW were found to provide feedback to certain farmers who had performed better than others. In all the observed three training session no positive feedback was given to farmers. In asking the interviewed farmers whether they had once received constructive feedback during their training session, Mr. Mangena said that;

'If one performs better in trying the technology that is when the AEWs praises you and tell you to continue doing the same at your farm. If you fail to do as expected, they will be unhappy about the poor performance. They always expect us to perform better in practicing the technology'.

Positive feedbacks were given to farmers who performed better in practicing the trained technologies such as during field days. The feedbacks were given not only by the responsible AEW but by other farmers. Mrs. Mutomba said that;

'During field days the farmer is praised by the AEWs and by other farmers to continue working hard and even to increase the area on the new innovations. Some farmers will be singing songs of praise to the host farmer and the AEWs who work in the area'.

Mrs. Chimusana explained how AEWs felt to some farmers whose crop does not perform as expected.

'Extension workers praise farmers who had a good crop from the innovations. If your crop is bad they will not be happy. They only tell you to pull up your socks and work hard for positive results to come. Truly speaking, extension workers do not like lazy people. They like the one who produce positive results. Sometimes this frustrates us and wants to stop practicing the new innovations'.

(The lazy person refers to someone who does not practice the new innovations trained by AEWs or someone whose crop failed to perform better maybe due to shortage of fertiliser). This was found to be the same to all the extension workers interviewed.

5.6 Sequence of activities

The table below was found in the office of all the interviewed extension workers. This was the moisture conservation calendar which farmers and AEW should follow in practicing the innovations.

Table 5.3 Extension activities on moisture conservation practice

Activities	Time of the year
Winter weeding	May to August
Selections and marking the field for demonstrations	May to September
Digging basins	July to October
Mulching/ residue application	May to November
Pre-planting weeding	October to November
Planting	October to early December
Post plant weeding	November to February
Fertilizer application	November to February
Post top dressing weeding	December to March
Clean weed at harvest time	March to April

All AEWs interviewed were found to follow the schedule as shown in table 5.2 above in training farmers on moisture conservation innovations. From this research farmers were found to be able to state exactly the activities as shown in table 5.3 above but clearly said that they do not follow all the activities as it do not allow them to rest during the season.

Mr. Mangena said that,

'If you follow exactly what extension staff wants, you will not have time to do other duties on your farm. The moisture conservation innovation activities if followed according to what is wanted you die in the field. I need time to rest and visit my children in town during winter time. Sometimes I follow what I feel is practical on the farm rather than sticking to all what you are taught by extension agent. I follow some other operations and leave others'.

This was also echoed by other farmers interviewed when they say that *moisture conservation innovation is so demanding that if followed exactly according to book you grow thin until you die.*

During farm observation we found farmers applying some mulch and digging basin. This was coinciding with the observed training session and with the table 5.3 above. Fig 5.3 a & b below shows one farmer applying mulch and the other one digging planting basins.

Fig 5.3 (a) Farmer applying mulch and (b) farmer making basins



Winter weeding was one of the activities farmers were found not happy about. All the farmers mentioned winter weeding as unnecessary as it takes their time for other households' commitments. All farmers clearly states that there was no need for winter weeding as livestock would graze whatever will be in the fields during winter.

In one of the farmers some cattle were found even grazing the mulch which the farmers had left for the field. This is as in fig 5.4 below.

Fig 5.4 Cattle feeding on mulch



One farmer Mrs. Chimusana had this to say;

In practicing this technology I follow what the extension workers tells us. Sometimes what I do with my family, when extension workers are teaching us on mulching I also apply the mulch during that time. When it is time to plant I also do planting. If you follow that your yield will increase. But there are some operations which they teach us which are not possible to do such as winter weeding. That one is not necessary in this village'.

5.7 Some Success and failure stories

This section tells of some success stories as some evidence that famers have practiced the trained technologies in their own fields. Also failures were included to show what the might also be the problem in training the farmers.

5.7.1 Success stories

According to the interviewed AEWs the training of new moisture conservation innovation in the three wards has made some achievements. In ward 16 of Marondera district there were 65 farmers who were attending the training on new moisture conservations out of the 1500 farmers in the whole ward. Out of the 65 farmers 52 farmers were practicing the new moisture innovations with some modifications on the new innovations. This had been achieved within three years since the new innovation was introduced in the area. In ward 17 the AEW has 90 farmers attending the training on new moisture conservation innovation. Out of 90 farmers 80 had been confirmed to practice the new moisture conservation. In ward 18, there were 110 farmers attending training on the new moisture conservation. Out 110 farmers 80 were said to be practicing the new moisture conservations. This was also supported by the records of farmers at the district office. The table below shows the number of farmers who adopted the moisture conservation farming. This information was from Agritex crop survey report 2011.

Table 5.4 Number of farmers adopted moisture conservation technology

Years	2008/09 season	2009/10 season	2010/11 season
Ward 16	30	43	65
Ward 17	21	39	80
Ward 18	36	63	80

Source: Agritex report, 2011

Table 5.4 above shows an increase in the number of farmers practicing the new moisture conservation technology in Marondera ward by ward. Also the area put to maize in hectares on moisture conservation innovations were said to be having increased for the past 3 years. This was confirmed by the report done by Agritex on cropped area. This was also from the Agritex crop survey report 2011.

Table 5.5 Area of maize put under moisture conservation technology

Years	2008/09 season	2009/10 season	2010/11 season
	Area in hectares		
Ward 16	10	17	40
Ward 17	8	18	38
Ward 18	11	24	34

Source: Agritex report, 2011

Table 5.5 shows also an increase in the area of maize put under the new moisture conservation technology for the past three year.

Of the six interviewed farmers five were found practicing moisture conservation technology. Mrs. Paudhara had this to say

'When I started practicing moisture conservation technology in 2008, things were not easy by then but I worked hard. It was after the extension worker introduced this in this village. That year I managed to plant early because I had already made some basins for planting. From my small field I harvested what was enough for me and my children. That year most families harvested nothing as it was a drought year. From that, year every season I am harvesting more than enough for the season.'

Also Mr Mangena commented the technology as follows

‘Moisture conservation technology is an eye opener to me. It has made my life better now. Since I started using this method of farming my yield has been increasing compared to the past years when I used to borrow some food for my family. Now they are coming to me for help. Now I am the bread basket of this village. Everyone who is practicing this technology is not suffering from hunger’.

In observing his granary it was fully of maize and he also said that this season he managed to sell some maize to the grain marketing board (GMB). This was also shown in the receipts from GMB where he had sold 150kg of maize.

One farmer Mrs. Tambudzai was not practicing the trained technology said that she was surviving through selling of vegetables. She said that maize does not pay more than vegetables.

5.7.2 Failure stories

Despite the continuous trainings done by the AEWs there were some farmers who had stopped attending trainings on moisture conservation innovation in ward 17. Some had never attempted to practice the new innovations. Some had practiced the new innovations for only one season and completely stopped. This was found in the extension worker annual reports to the secretary. In wards 16 and 18 there were only 3 farmers who have stopped attending training this season. This was observed in the training register of the extension workers. According the extension workers the reasons for farmers to stop attending the training were thought to be failure to visit the farmers on regular basis and give them support. It was also a failure to recognise their real problems and try to find solutions to the problems.

CHAPTER 6: DISCUSSION

This chapter discusses the factors influencing transfer of learning in designing training for farmers by Agritex extension workers. It aims to analyse from the preceding chapter, the factors that hinders and that supports transfer of learning in training smallholder farmers on new moisture conservation innovations. It also reveals the challenges in designing the transfer of learning so as to find ways of improving transfer of learning in designing training for farmers.

6.1 Farmer participation during training

a. Demonstrations

Through demonstrations farmers were given lecture by extension workers after which they were demonstrated how to carry the different operations. Then some farmers were then given the time to practice the demonstrated operations and explaining to other farmers. This is similar to what Lim (2000) said that when trainees explain to others it helps them to master the new innovations. It also helps the farmers to improve their knowledge and skills about the trained innovations. Again through practicing farmers will be learning by doing. This makes the farmers to feel how hard or easy the new innovations are. It also helps them to find out where and how they can apply trained innovations. This is similar to what Lim and Johnson (2002) who said that practicing helps in the transfer of learning. Again farmers were found to be asked some questions during training. This helps farmers to start processing the information in their own minds thereby turning it into their own knowledge. This is similar to the conclusion from Race (2010) that for learning to take place trainees has to make sense of what one will be doing. This is done by asking questions and analysing the situations.

However, from this research it was also found out that due to limited time and big groups some farmers were not given enough time to practice the trained innovations. This means some farmers were not practicing and this is what Lim and Johnson (2002) said when trainees are not given sufficient practice and exercise they do not learn the new innovations and it hinders transfer of learning.

Visual aids and writing notes

This research found out that the department has shortage of visual aids such as chalk boards and flip charts. Also most farmers were without note books where to write some notes given to them by AEWs. Again the hand outs were in short supply for the trained farmers. This is against what is explained in chapter 2 sections 2.5.2 that visual aids helps to make learning lively and it also improves the retention of the trained innovation in farmers' mind. Again the minimal use of the visual aids by AEWs means that they failed to capture and maintain the attention of farmers during training. This therefore reduces the transfer of learning. There were no differences in the use of visual aids in all the three wards and among the three extension workers interviewed.

Showing results of the innovations

On field days and at demonstration plots farmers were shown the positive results of the new trained innovations. The results help farmers to accept and be motivated to learn than just explaining the advantages of the new innovations. The results help in creating confidence and also open space for more discussion and interactions with other stakeholders. Showing farmers some results also helps convincing the farmers' real benefits of the new innovations. This was even supported by some farmers who said that they had seen the true results of the new innovations at field days and concluded that it was worth practicing. All three extension workers

in three wards were found to show farmers the results of the trained practices in field days and at demonstration plot.

b. Individual farm visits

From this research it was found out that AEWs visited some farmers and encourage them to practice the new trained innovations. However, only few selected farmers were visited. This means that AEWs are not able to visit all the trained farmers on moisture conservation innovation hence do not get individual support from AEWs at their farms. This might be a limitation in the transfer of learning as farmers who are not visited might think that new innovations are for those who are visited and supported by AEWs. Farmers first tried the new trained technology on their own on small piece of land and later increased the area after seeing and satisfied with the some positive results and encouragement from extension workers. This was found to be the same in the entire three wards as Mr. Mangena said that he increase his area under the new technology after trying it and encouragement from AEWs.

c. Field days

In this research it was found out that AEWs uses field days as a training approach. The farmers are given time to explain and discuss the trained innovations. Questions and answers sessions are done during field days. The host farmer by explaining to other farmers how he/ she had practiced the new innovations gains confidence and skills. This is similar to the demonstrations approach where transfer of learning is supported by explaining and observations of the new innovations. Also during lunch time farmers continue their discussions about the innovations and many questions can be discussed informal. It is also believed that the trained farmers can somehow take charge in answering the questions asked by other farmers during training thereby improving their learning. Again at the field days some pictures which show the new innovations were displayed along the fields. This makes the farmers to have a look and observe how the innovation can be done. This was found to be the same in all the three wards. Also during field days farmers who performed better were given some prize. This was found to encourage competition among farmers and work toward the new innovations. In another way some farmers who fail to get the prizes might feel discouraged and stop participating or attending the field days. However, not all trained farmers were given enough chance to observe and follow all the training during field days due to the assigned duties. This therefore hinders farmers from learning the new innovations.

d. Look and learn tours/Exchange group visit

In this study, group of farmers were found to visit groups trained on the same innovations. This was found to motivate farmers to learn. From other researches it was found out that farmers learn better from their counterparts (Agritex training manual 2006). This was supported by Mrs. Paudhara when she said that learning comes through travelling to other places and also from other people. The look and learn tours like field days and demonstrations were found to be useful and help farmers observing the real life situation of the new innovation. These training approaches were found to give an opportunity to farmers to observe, discuss and get first hand information and how the skills can be applied. Observing is more useful than hearing or reading about it. Like in all the training approaches farmers who share information gain confidence and skills to explain the new found innovation skills and also learn from their own experience. This then was found to support transfer of learning. However, field days, farm visits and other trips were found to be costly and some farmers could not afford to meet the cost at every tour and need a lot of planning. This means that these trips are not regularly done. Also farmers who cannot afford to pay for the cost do not attend the look and learn tours. This therefore is a

hindering factor to transfer of those farmers who fail to attend the tour. The look and learn tours were done to a limited extent in all the three wards due to cost limitations. When simplifying the planning and flow of information through exchange group visits, it can be as shown as in fig 6.1 below.

Fig 6.1 Exchange visit planning and information flow

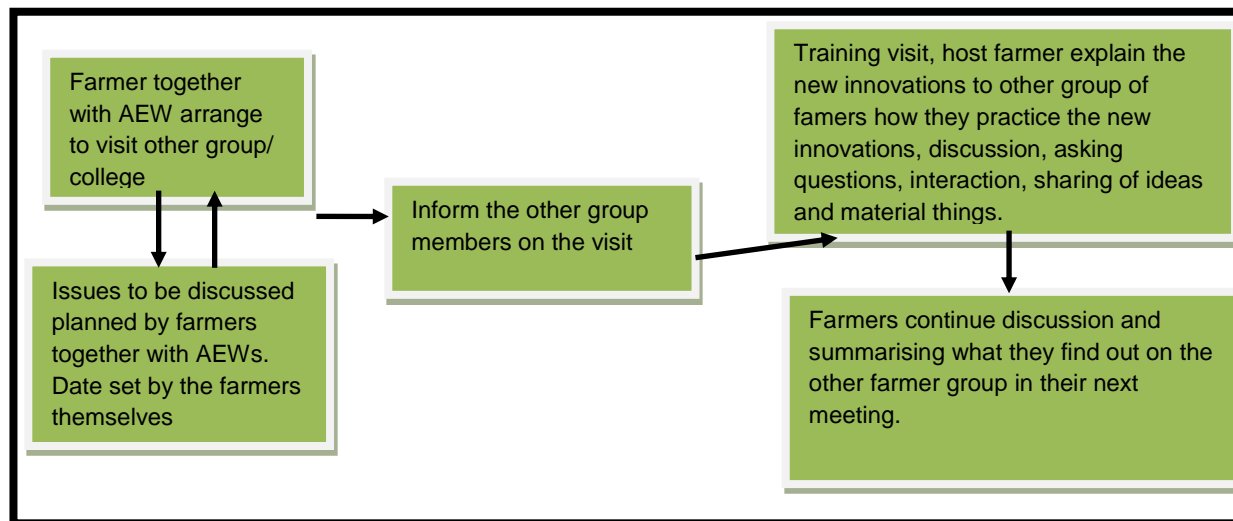


Fig 6.1 above shows that farmers arranged for exchange group visits on the selected topics to be discussed. General, the host farmer was the one who explained to others what he/ she has done. The other farmers observed and asked questions for clarifications.

6.2 Learning goals and objectives

Some farmers were without specific goals and extension workers were not helping them to make their own goals. This made the training goals and farmer goals to be different. According to Lim and Johnson (2002) and Agritex training manual (2006) trainees who do not have specific goals during training reduces transfer of learning. From this research it was found out that, some farmers had objectives not related to the training of the new moisture conservation innovations hence hindering transfer of learning. This was found to be the same in all three wards. This suggests that some farmers' objectives of attending the training are different from extension training objectives. From literature review it is stated that trainees whose goals and objectives are different from the training goals cannot participate the same way like those with goals similar to the training objectives.

6.3 Providing feedback during and after training

In this research it was found out that, some farmers were given positive feedback during training. Some feedback was given by both AEW and farmers. Some praised the farmers who performed well during the training. This was found to motivate and encourage farmers to practice the new moisture conservations. From literature review feedback gives information on the results and helps in guiding the farmer in his/ her efforts thereby improving learning. However, some farmers were ignored to be given positive feedback and some were given negative feedback and this failed to motivate farmers to continue practicing the trained innovations. This is similar to what Clarke (2002) and Merriam & Leahy (2005) said that positive feedback encourages transfer of learning while negative feedback or ignoring trainees' feedback hinders transfer. Fig 6.2 below shows how positive and negative feedback influences farmers to practice the new innovations.

Fig 6.2 Influence of feedback to farmers.

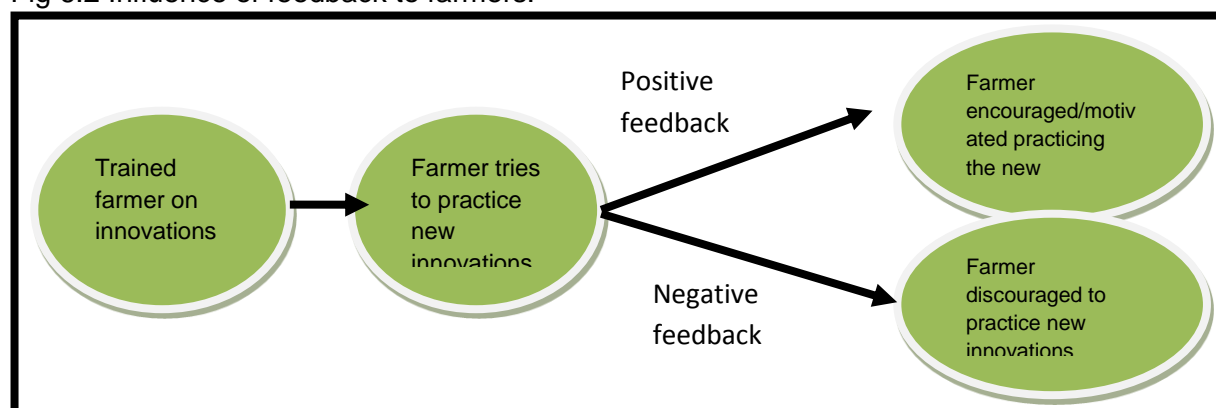


Fig 6.2 above shows that, when feedback is negative it affects the farmers to continue practicing the new moisture conservation innovations hence reduces transfer. If the feedback is positive and supportive the farmers are encouraged to continue trying and learning the new innovations therefore supports transfer. There were no differences in the way extension were giving feedback to farmers in all the wards. All AEWs had the same perception of giving feedback to farmers whose crops have shown to be better than other farmers.

6.4 Farmer to farmer coaching

From the research it was found out that farmers were not visiting each other for the reason of coaching. Most farmers who attend trainings on moisture conservations stayed far away from each other and cannot afford to visit their colleagues regularly only for the sake of observing and discuss what they will be doing. In cases where they visited one another it was for the reason of wanting to share or to borrow food materials, for beer drinking, funerals or other functions. On such cases they may or may not discuss the new trained innovations. The research also found out those farmers who visited each other does not have recorded topics to discuss in relation to the new moisture conservation innovations. There was no recording and discussions of the discussed topic later. This means that farmer to farmer coaching is a hindering factor of transfer in the training of moisture conservation innovations. This is contrary to what Beverly (1994) and Sherman & Freas (2004) said that farmer to farmer coaching promote and encourage learning among them.

6.5 Extension worker to farmer coaching

Basing on the results of this case study it was found out that, AEWs visit farmers and train them as extension worker to farmer coaching. This is a supporting factor to transfer of learning as supported by findings from literature review that training which is followed by one to one coaching improves transfer of learning (Merriam and Leahy, 2005). However, in this research it was found out that AEWs were not able to do coaching of all the trained farmers. To farmers who were visited and coached the information was not recorded so that he/ she can give related support to those farmers. This therefore reduces transfer of learning to farmers who were not visited and coached by extension workers.

6.6 Sequence of activities

From this research it was found out that, the extension trainings were coinciding with the timing of operations in the farmers' fields. This was the same in all the wards and among the extension workers who were interviewed. Even though farmers had mixed reaction on the technology farmers had support on the benefits obtained from the moisture conservation. This is helping farmers to practice the new moisture innovations. However, most farmers find it difficult to follow

what they were trained due to the demands of the trained innovations. This suggested that some farmers were following the sequence of activities planned by the extension workers. This forced farmers to modify or improve the trained technology to suit their farming situations.

Basing, on the discussion chapter, table 6.1 below gives a summary of factors supporting or hindering transfer of learning in the case of Marondera Agritex.

Table 6.1 Factors influencing transfer of learning on moisture conservation practices

Supporting factors	Hindering factors
Farmer participation during training	
Farmers were given chance to explain the trained technology to their counterparts so that they learn from that.	Some farmers were not given chance to explain to other famers due to time limit during training as the trained group are big.
Farmers practiced the trained innovations so that they can learn by doing the exercise.	Some farmers were not having enough practice and exercise due to time limit during training.
Written notes were given to farmers for reference when at their farms.	Some farmers were without books to write the given notes and this means they have nothing to refer to when at their farms.

Supporting factors	Hindering factors
Learning goals/objectives set by farmers	
Some farmers have specific goals which make them want to participate much during training.	Some farmers had no different goals to the training objectives and this reduces their participation and concentration during training of the technology.
	AEWs failed to carry out individual training needs assessment and this makes them to make blankets training objectives which sometimes differ from the individual farmer objectives.

Supporting factors	Hindering factors
Providing feedback during training	
Supportive feedback given during training by AEW and other farmers which motivates farmers to continue practicing the trained innovations.	Negative feedback given during training to and discouraging farmers not to continue practicing the trained technologies.

Supporting factors	Hindering factors
Farmer to farmer coaching	
	Lack of farmer to farmer coaching leading to farmers failing to learn from their counterparts through explaining and discussions.

Supporting factors	Hindering factors
Extension worker to farmer coaching	
Extension worker to farmer coaching done to some farmers so that the farmer together with extension worker can discuss individuals' problems and try to find solutions.	Extension worker to farmer coaching not done to some other farmers leading to farmers having no one to help in guiding them on how to get solutions.

Supporting factors	Hindering factors
Sequence of activities	
The training follows a sequence of activities similar to farmers' activities so that farmers cannot be overloaded with unnecessary information which they cannot use in the near future.	The extension activities are too intense and time consuming for the farmers to be able to follow all the activities.

5.7 Success and failures

From the success stories it was found out that farmers practicing the new technology were increasing and also the area put under moisture conservation was also increasing. This was mainly due to the positive results got from the technology such as increase in yields. However, there was also the failure of some farmers stopping to practice the trained innovations. Some farmers thought that inputs for farming were difficult to get and that the price of maize was low. This discourages some farmers to practice the trained technology.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

This section is a presentation of the conclusions and recommendations taken from the results and analysis of this research. The conclusion will be trying to answers the sub questions of this research on transfer of learning on moisture conservations innovation training.

7.1 Conclusions

This study shows that, there are many factors influencing transfer of learning in training farmers on new moisture conservation innovation. The factors can hinder transfer of learning due to failure of fully practicing what supports transfer of learning during training or other limiting factors. This means there is a need to focus on improving the transfer design so as to improve the learning processes within the extension worker training programs. The information collected on training design from this research such as failure to make every farmer participate in training, the training of large groups, failure to give constructive feedback to farmers and lack of well organised coaching identifies the possible areas which can be improved to further improve transfer of learning. In most cases both AEWs and farmers agree on the transfer design which can support transfer of learning on training of new moisture conservation innovations. However, there are some factors outside the control of Agritex AEWs and farmers which need to be improved so as to improve the transfer of learning. These are shortage of handouts, shortage and poor quality chalk boards and flip charts and shortage of transport to visit famers on their farms.

From these researches most AEWs use a wide range of different training approaches and strategies and most of them are group based and some visual aids sometimes were used to support group trainings.

During training farmers are given chance to teach, explain, practice, observe and to ask questions. This helps farmers to transfer what they are learning. However, not all farmers were given enough chance to participate during training and this limits the transfer of learning. Extension workers should involve every farmer and encourage them to participate during training.

Visual aids such as the flip charts and chalk boards were available and used by the extension workers during training. However, their dirtiness and torn flip chart made it difficult for the extension workers to effectively use them hence limiting transfer. Also the use of unclear markers by the extension workers limited farmers to see clearly what was written and handouts were available but were not enough. The boards were dirty and sometimes not clear for farmers to see what was written on them. It can be concluded that visual aids such as flip charts and chalk boards are not always available and of poor quality. Also hand out and leaflets are also in short supply for the farmers and they need to be in the language understood by the farmers.

Also most approaches such as the look and learn tours, field days and demonstrations were found to be useful to transfer of learning as farmers were given chance to observe the reality of the new innovations. These approaches were found to be one of the methods used to transfer learning to farmers. Extension workers need to continuously improve the use of these approaches so that farmers benefit a lot from them. Again most farmers enjoyed and appreciated the value of these approaches as they need to learn from their counter parts. There is a need to make every farmer to be involved in touring the farm so that no farmer is disadvantaged in observing the new innovation.

Extension workers were not helping farmers in setting their own goals. They only made some blanket objectives without considering the individual training needs. This made some farmers to have different objectives different from the training objectives. It can be concluded that failure to help farmers to make appropriate goals is a hindering factor in training farmers the new moisture conservation innovation.

Some farmers were given positive feedback both by the AEWs and by other farmers. This motivated the farmers to continue working towards improving the new innovations. However some farmers were not given feedback or were given negative feedback because of failing to perform well when practicing the new innovations. This discouraged farmers to take up the new innovation trained.

Farmers were found not coaching each other in training the trained technologies. The reason was that they stayed far away from each other. At some point they could visit each other and may or may not talk about the trained technologies. This was happening at funerals, beer drinking places. So even if they discuss the technologies it was not planned and nothing was recorded and in some way this hinders the way farmers were leaning.

AEWs were found to coach some farmers but not as was expected. They were not able to coach the farmers to the full level and some farmers were not even coached at all. This therefore hinders the transfer of learning in training farmers on new moisture conservation innovation.

Generally, farmers were involved in the planning of training such as the selection of the training venue, time and date of training. At some point farmers were also involved in planning for certain items to be discussed during training. However, at some other times farmers were not involved especially when NGOs and other parties were involved in setting out some demonstration fields.

Extension trainings were planned in such a way that they coincide with the operations on the farmer's fields. This was to make sure the train farmers what they can use at that time. This was found to aid transfer of learning. However, the technology was considered intense by farmers and this might have some negative attitude toward the innovations thereby reduce transfer.

7.2 Recommendations

In all the training sessions and approaches every farmer should be given equal chance and time to practice the new innovations so as to increase specific skills on the new innovation. Extension workers can be trained how they can encourage every farmer to participate during training. It is important if group sizes for training are reduced to a number which is manageable and where every farmer can have equal chance of participating. This can be done by dividing the main group into small subgroups where they can be trained separately.

It is important that individual farm visits be done not only on selected farmers but to every farmer to support the farmers. This can be possible if extension workers follow a list of all the trained farmers without bias of distance and accessibility. This can be achieved when the district supervisor can monitor the progress of individual farm visits. Also Agritex department could avail funds for repair and maintenance of AEWs motor bikes to improve their mobility. Again it is vital if extension workers discuss with the whole farm family members to improve participation as different family members have different thinking of solving problems and different potential solutions.

Farmers have different learning needs at each stage of training of the innovation so it is important to include farmers in planning the training and also in finding the individual training objectives. AEWs can plan for group meeting where farmers can identify their own training needs, create their own objectives and also plan for their own activities in relation to the new moisture conservation innovations. When farmers are involved in this planning they are more likely to have the same objectives with training objectives and this improves transfer of learning.

To improve on encouraging farmers in participation extension workers can avoid making too much negative feedback or ignoring giving feedback to some farmers. Agritex can train its staff how to give feedback and making it constructive even when it is negative because giving feedback is not easy for many people.

AEWs need to improve in coaching farmers. Agritex department can help by training AEWs how coaching can be done and how they can improve on farmer coaching.

There are constraints in the transfer of learning when designing the transfer program. Some of them are illiteracy level of farmer, shortage of financial assistance, fear of the leaders by AEWs.

To reduce the impacts of these constraints in training farmers:

It is important that AEWs use visual aids and demonstrations which do not need literacy for farmers. Also includes dramas, songs, poems, drawings and pictures which do not need literacy level.

In most cases frontline AEWs are responsible for selecting of training approach to use in training farmers on new moisture conservation innovations. It is wise that extension workers select the training approach looking at the use of available resources. This can be achieved when AEW select an approach of training which is less costly but effective for the type of message to be trained. Use materials available or provided by farmers or borrowed or re-used to reduce the cost of some materials. This can be improved by learning from each other among extension workers and networking with other organisations and NGOs. Agritex at provincial and district level can improve the networking by coordinating the different extension workers and also with other stakeholders.

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Annex 1. Check list used for data collection

1. Farmer participating during training

- Observe the training session
- Encouraging farmers
- Limited lecturing. .
- Active participation
- Practice and exercise session
- Expectations of the of farmers needs met.
- Idea contributed
- All farmers contributed.
- Encourage sharing of their experiences

2. Learning objectives set by the farmer

- Goals and objectives of the training
- Objective of the farmer for attending training.
- Observe in the training plan of activities
- Goals set with extension worker and farmer together.
- Evidence of actually utilizing the training in practice
- Farmer reaction to training program/ innovation
- Motivation farmers to participate in training.
- Expectations /hopes
- Fears/ concerns

3. Peer Coaching (Farmer to farmer Coaching)

- Training other farmers
- Field days where farmers share experiences
- Successful coaching topic
- Check with the plan of action
- Observed during training

4. One on one coaching (Extension worker to farmer coaching)

- visiting the farmers at their farms
- Assessment for each farmer
- Topic/issue discussed
- Reaction/responds
- observe in the plan of activities

5. Providing feedback during training

- Feedback given during training
- Observe during training
- Seek feedback from farmers.

6. Sequence of activities

- Sequencing of activities
- check planning schedule.
- Farmer view regarding benefits perceived as a result of training

➤ Other issues to Observations

- Motivation- Do they encouraged to contribute their experience during training.
- Active involvement and participation during training
- Farmers are listening/ concentrating or restless.
- Trainers giving feedback, brainstorming, probing
- Method of training used is it relevant.
- Time spent in training.
- Trainer: Is the training atmosphere of friendly and encouraging to learn.
- Do the teaching methods allow farmers' previous experiences to be acknowledged or used.
- Are you avoiding lectures or limiting them to few minutes.
- Timing of the session

Annex 2. Checklist for specific areas

Sub dimension	Observed in the field	Observed during training	Farmer interview	Agriculture Extension worker	Reports and documents from farmers and AEWs
Farmers participation during training		Practice and exercise session, group discussion, plenary discussions, farmers encouraged to contribute their ideas/ experiences. Limited lecturing. Conclusions drawn by farmers	Farmer contributions and participation during training.	Extension approaches used. Training methods used. Success story of allowing farmers during training	Check training work plan of the approaches used for training.
Learning goals /objectives set by the farmers themselves	Observe what the farmer is doing at the farm (roles, crops grown, interesting farming practices)	Selection of training dates, venue, time, topics to be trained and who to train	Farmer goals/objectives for attending training. Goals of the farmer Selection of training dates, venue, time, topics to be trained and who to train.	Goals/Objectives of extension trainings. Selection of training dates, venue, time, topics to be trained and who to train	Check the goals and objectives of extension training. Check the training needs assessment reports.
Peer coaching (farmer to farmer coaching)	Observe field visits by other farmers		Farmer visits and what is discussed.	Group of farmers visiting each other	Check in the record books what was to be observed, discussed and conclusion drawn
One to one coaching (extension worker to farmer coaching)			Extension farm visits/ open discussion with extension. What was discussed	Extension farm visits/ open discussion with extension. What was discussed	Check on the farm visits plan. What was discussed and the individual farmer problems/limitations.
Providing feedback to farmers during and after training		Feedback during training	Feedback given	Feedback given	Check on the records mistakes done by the farmers and what feedback was given.
Sequence of activities	What activities will you do between now and next month.		What activities will you do between now and next month.	What activities will you do between now and next month.	Personal plan of action

Annex 3. Interviewed farmers and AEWs

Farmers

The names below are true names of the farmers and allowed the researcher to use them in the report.

1. Mrs. Paudhara P who is 65 years old and has been farming since her teenage days.
2. Mr. Mangena J. who is in his late twenties and has started farming after finishing ordinary school level twelve years ago.
3. Mrs. Mutomba H who has been farming since she was married ten year ago.
4. Nyabonda K. who is a young farmer trainee on moisture conservations.

The following are not true farmers' names but were suggested by the interviewed farmers to the researcher.

5. Mrs. Chimusana K, who is in her early forties and has been on the farm since she was married 20 years ago,
6. Mrs. Tambudzai N (one of the trainee farmer on new moisture conservation innovation)

Extension workers

1. Mrs. Chingonzo F an Agritex extension worker who joined the department in 2004.
2. Mr Gore T who started working as an AEW since 1998 in Marondera district .
3. Mr Dzvete M. an extension worker for the past seven years .

Annex 4. Marondera ward map

