



Influence of Training Method on Learning Ability of Smallholder Farmers: Case of Moisture Conservation Farming Training

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Authors' contributions

This work was carried out in collaboration between all authors. Author ME designed the study, wrote the protocol and supervised the work. Authors MN and MVT out all work and performed the statistical analysis. Author GC managed the analyses of the study. Author MD wrote the first draft of the manuscript. Author MN managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

This study sought to identify factors that influence learning during training among small holder farmers on the new moisture conservation innovations (conservation farming) by Agricultural Technical and Extension Services (AGRITEX) and the objectives of the study was to identify the training methods used by AGRITEX officers in training Conservation agriculture and to find the effectiveness of the training methods in transferring knowledge
The study took the form of a case study. Six small holder farmers trained on the new moisture conservation innovations were researched on.
The study showed that AGRITEX to certain extent gave farmers some chance to participate during

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training especially in carrying out demonstrations, field days and during look and learn tours. The look and learn tours were appreciated most by many farmers as they were saying they can learn much by visiting other farmers. However, AGRITEX can further improve its training to improve learning among farmers through participatory course design which can help in the improvement of training for farmers to improve on practicing what they have trained.

Keywords: Learning; training; small holder farmer; conservation farming.

1. BACKGROUND

Zimbabwe's economy depends on agriculture. 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 in terms of the frequency and intensity of dry spells which has increased for the last ten years now [1]. The smallholder farmers are mostly affected as they depend on rain fed agriculture. The dry spells affect 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 [1]. This is a responding strategy to reduce the impacts of the dry spells to the smallholder farmers as they cannot afford to buy maize seed and fertilizer for the farming season. Moisture conservation innovations and relief inputs provided by the government do not improve the productivity and the smallholder income, suggesting that the input relief intervention does not provide sustainable gains [1]. This has led to a call on the need to focus on relief assistance that targets sustainable crop production techniques that also aim at improving soil fertility and environment protection as sustainable land use has become a worldwide issue. One technology option for promoting soil fertility and water management has been the conservation of soil water, nutrients, and farm

power using a variant of conservation agriculture techniques.

Despite the moisture conservation innovations hype, there has been an ambivalent reception of this innovation by smallholder farmers in Zimbabwe [1]. This resulted in many researches focusing on the reasons of low innovation uptake. The researches however were looking on the characteristics of the moisture conservation innovations without focusing on training methods that are used in training the smallholder farmers by the principal agricultural extension organization. They have been using cognitive learning styles like demonstration, field days, lecturing and describing to smallholder farmers as they continue to intensify the actual uptake of conservation farmers.

2. SITE SELECTION AND RESEARCH DESIGN

This study was done in Marondera district of Mashonaland East province. Marondera district was purposively chosen because it is one of the districts where moisture conservation innovations are promoted by Agritex department, NGOs, farmer unions and private companies. The research was done through a case study.

Three Agricultural Extension Workers as shown on Table 1 (AEW) 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.

Table 1. Number of respondents interviewed

Respondents	Number	Remarks
Agritex Extension Worker	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
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Six farmers were randomly selected from the list of the trained participants. The farmers were selected from the wards of the selected extension workers. Of the 6 farmers selected 4 of them were female and 2 were male.

3. DATA COLLECTION AND ANALYSIS

Data was collected through semi structured interviews and planned observation. 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. Collected data focused on effectiveness of the training methods on learning for smallholder farmers.

The data collected from the field was first grouped, sorted, edited and summarized. 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 drawn in relation to the findings of the research.

4. RESULTS

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.

4.1 Demonstrations

These were used at demonstration plots for groups of farmers to train them on new moisture conservation innovations as shown on Fig. 1. The AEWs and farmers initiated demonstration plots at the farmer's field. The demonstration plots were set along the road for other farmers to observe. 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

Also farmers were found to appreciate the approach where extension workers demonstrated the new innovations. This was echoed by 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. The word chidhomeni means the demonstration worker who moves from farmer to farmers demonstrating the proper farming methods.

One of the farmers, who is in her early forties and has been farming since she was married 20 years ago, had the same sentiments.

'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'.



Picture 1. Farmers working at a demonstration field

During training demonstration plot sessions farmers were asked by AEWs to explain to others what they have done.

'Extension workers of these days give 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'. This was supported by another farmer.

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

4.2 Visual Aids and Writing Notes

In all the observed training sessions in 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 below.

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 had no flip charts to write on, 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, AEW asked farmers to take notes 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'.

As for leaflets and handouts all three AEW said that, they were not receiving enough handouts and leaflets to give 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.

4.3 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. One of extension workers for the past seven years said.

'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. Two trainee farmers on new moisture conservation innovation 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 actually works and is worth practicing'.

4.4 Individual Farm Visits

The extension workers visited some farmers trained on moisture conservation innovation and encouraged them to practice the new innovations. 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 one of them explained in below.

'After training farmers I visit them individually on their farms to check progress on new innovations..Farmers appreciate a lot when you visited them as this can be seen by the care they always give during visits. However, the limitations in visiting the farmers are that, we do not have motor bikes to cover all the farmers Some farmers live very far away from my compound around 8km from office. Also it is impossible to visit all the 90 farmers trained on moisture conservation innovations that are all over the villages because of pressure of work. This season I have managed to visit only 5 opinion leaders out of the total 90 farmers who attended my training.

This was supported by some of the farmers, who said,

“Extension workers occasionally visit our farms. During the visits they 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 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 increasing 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 may be it was because she was not a good farmer compared to those who are mostly visited by AEWs. She also suggested that may be it was because she lives far away from the AEW's homestead.

4.5 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 explained by one female farmer 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 two farmers viewed field days as the time when people had time to share new ideas and learn from one another as was commented by one farmer.

‘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.

4.6 Look and Learn Tours/Exchange Group Visit

The extension agent together with the farmers arranged a look and tour in the ward. A date and topics to be discussed were conveyed to members of the group. All 6 interviewed farmers appreciated the idea of visiting other farmers as evidenced by the speech in below.

‘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 .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.

4.7 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 was recited in local language.

4.7.1 Farmers, what 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 starts 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.

4.8 Learning Goals and Objectives

Objectives for training sessions on new moisture conservation innovations were formulated by AEWs as they believe that farmers cannot afford to make useful objectives as was noted from one female AEW.

'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'.

AEWs set their training objectives directed by their supervisors. And none of the AEWs carries farmer training need assessments as reported by two AEWs.

'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. Needs are generalised 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'.

It was also found out that farmers attended training for different reason as one woman explained;

'I attend these training because my husband asks me to attend. During the farm observation after the interview, one woman 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.

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 as narrated by one AEW below.

'I know that moisture conservation innovation is a method with several innovations or components involved and there are many practical skills needed to effectively train the farmers. They must be involved 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.

4.9 Farmer to Farmer Coaching (Peer Coaching)

Farmers live far away from each other and did not have planned coaching on each other as reported below by one woman.

'I live far away from my colleagues and it is difficult to visit each other. When I visit my colleagues may be it will be during a funeral or when I want to borrow some seeds or food items for my family'.

This was supported by one AEW who said:

'It is very difficult to arrange farmers to visit each other and observe and then discuss the

operations of their colleagues as they live 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'.

4.10 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 Agricultural extension supervisor and all other 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'.

Another extension worker also agreed with two above;

'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'.

4.11 Providing Feedback during Training

AEW were found to provide feedback to certain farmers who had performed better than others. However in all the observed three training session no positive feedback was given to farmers but interviewed farmers revealed that they receive feedback as one farmer narrated below.

'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". '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'.

4.12 Sequence of Activities

The Table 2 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.

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

Table 2. 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
Clean weed at harvest time

December to March
March to April

“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.”

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. However, some of the farmers were seen in the field applying some mulch and digging basins as shown below although some complained that the work is too much.



2.(a) Farmer applying mulch



2.(b) Farmer making basins
Picture 2. Please insert caption

All farmers interviewed complained about winter weeding. They believe it is not necessary to weed in winter as livestock would graze whatever is in the fields as shown below on Fig. 2 where

cattle observed grazing even the mulch which the farmer had left in the field. This affects the process of CA as the mulch would have been eaten by cattle. There is need therefore, to keep cattle away from fields with mulch if the benefits of CA are to be realised.

4.13 Cattle Feeding on Mulch



Fig. 2. Cattle feeding on Mulch

5. DISCUSSION

5.1 Farmer Participation during Training

5.1.1 Demonstrations

Through demonstrations farmers were given lecture by extension workers after which they demonstrated how to carry the different operations. Then some farmers were given the time to practice the demonstrated operations and explaining to other farmers. This is similar to what [2] 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. It also helps them to find out where and how they can apply trained innovations. This is similar to what [3] who said that practicing helps in the transfer of learning.

Farmers were also asked some questions during training by extension workers. 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 [4] that for learning to take place trainees have to make sense of what one will be doing. This is done by asking questions and analysing the situations.

However, 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 [3] said when trainees are not given sufficient practice and exercise they do not learn the new innovations and it hinders transfer of learning.

5.1.2 Visual aids and writing notes

The results reveal that AGRITEX has shortages of visual aids such as chalk boards and flip charts. Most farmers had no note books to write some notes given to them by AEWs. Again the hand outs were in short supply for the trained farmers. There were no differences in the use of visual aids in all the three wards and among the three extension workers interviewed.

This is in contrast to what [5] found. They found out that visual aids helps to make learning lively and improves the retention of trained innovations. This minimal use of the visual aids may affect the farmers attention during training. This reduces the transfer of learning.

5.1.3 Showing results of the innovations

New trained innovations were show cased on field days and at demonstrations plots. The results help farmers to accept and be motivated to learn than just explaining the advantages of the new innovations. On these occasions, farmers held discussion and interactions with stakeholders. This creates confidence in farmers who are practicing the technology as well as the extension staff as they explain the real benefits of new innovations to other farmers. 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.

5.1.4 Individual farm visits

Farm visits were made by extension workers to encourage some farmers who are practicing conservation farming. However, only few selected farmers were visited as they were not able to visit all the trained farmers on moisture conservation innovation. This might be a limitation in the transfer of learning as farmers

who are not visited might think that new innovations are for those visited and supported by AEWs. It can also discourage some farmers who wish to start the innovation and those who have started on their own small piece of land and wish to increase the area after seeing and satisfied with some positive results and encouragement from extension workers.

5.1.5 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 [6]. This was supported by one farmer who 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 on 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 check 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.

5.1.6 Learning goals and objectives

Important components of training were not found in some farmers. Farmers were without specific goals and worse still, extension workers were not helping them to make their own goals. This made the training goals and farmer goals to be different as they were done differently. This may affect the transfer of learning as the aims are different from two parties. This is also supported by Lim and Johnson [3] and [6] who found that trainees who do not have specific goals during training reduces transfer of learning. 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.

5.1.7 Providing feedback during and after 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. 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 [7] and [8] said that positive feedback encourages transfer of learning while negative feedback or ignoring trainees' feedback hinders transfer.

The Fig. 2 below 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.

5.1.8 Farmer to farmer coaching

Most farmers who attend trainings on moisture conservations stayed far away from each other and could not afford to visit their colleagues regularly. 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 farmers who visited each other did not even 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 is in contrary to what [9] and [10] said that farmer to farmer coaching promote and encourage learning among them.

5.1.9 Extension worker to farmer coaching

AEWs visit farmers and train them. This is a supporting factor to transfer of learning as supported by literature that training which is followed by one to one coaching improves transfer of learning [8]. However, AEWs were not able to do coaching of all the trained farmers. Farmers who were visited and coached did not even record the information 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.

5.1.10 Sequence of activities

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 suggests that some farmers were following the sequence of activities planned by the extension workers. Some are forced to modify or improve the trained technology to suit their farming situations.

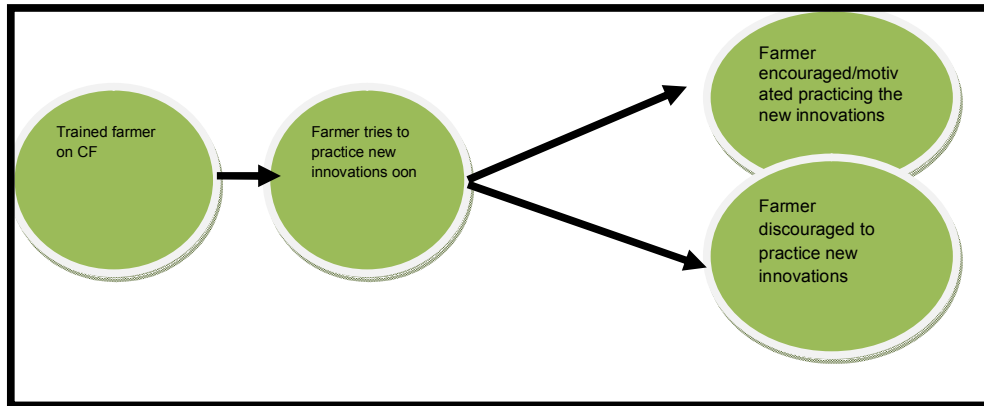


Fig. 2. Influence of feedback to farmers

6. CONCLUSION

Shortage of handouts and transport, poor quality chalk boards and flip charts hinders the transfer of learning by smallholder farmers.

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. Again most farmers enjoyed and appreciated the value of these approaches as they need to learn from their counter parts.

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 objectives different from the training objectives.

Giving positive feedback both by the AEWs and by other farmers facilitates the transfer of learning. This motivated the farmers to continue working towards improving the conservation farming.

Participatory planning of training like selection of the training venue, time and date of training facilitates transfer of learning. This is usually when farmers are involved in planning for certain items to be discussed during training.

Planning of training which coincides with the operations on the farmer's fields facilitates transfer of learning although the technology was considered intense by farmers and this might have some negative attitude toward the innovations thereby reduce transfer.

7. 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 should be trained on how they can encourage every farmer to participate during training.

Individual farm visits should 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.

Farmers have different learning needs at each stage of training of moisture conservation farming hence the AEW should include farmers in planning of training and also in finding the individual training objectives. AEWs should as well 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.

To improve farmers in participation, extension workers should avoid making too much negative feedback or ignoring giving feedback to some farmers.

AEWs should use visual aids and demonstrations which do not need literacy for farmers. They should also include dramas, songs, poems, drawings and pictures which do not need literacy level.

The AEW should use materials available or provided by farmers or borrowed or re-used to reduce the cost of some materials.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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