

*Evaluating Knowledge-sharing Methods to Improve Land Utilization and
Improve Food Security of Palestinian Small-Scale Farmers*

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1-Executive Summary

This applied research project was implemented by ANERA, in coordination with Ministry of Agriculture and five main NGO's, during the period March 2012-September 2013 in the West Bank. The research's overall objective was to contribute to maximizing the utilization of reclaimed mountainous land through sharing farmers' knowledge amongst their peers. The objective was carried out specifically through comparing between five knowledge sharing methods according to farmers' preferences. Activities included documentation of farmers' knowledge and success stories, exposing 95 selected farmers to documented knowledge by using the five methods, and evaluating the preference of farmers and reaction to different methods. Evaluation was conducted using pair wise ranking, direct matrix ranking and surveying all farmers. The project included participation of main stakeholders in agriculture led by the Palestinian Ministry of Agriculture. Representatives of partners formed a community of practice in knowledge management. The project team produced (19) short videos totaling 135 minutes. All videos were uploaded on Youtube, where they form an intellectual asset for Palestinian agriculture. All videos were shared on the project's Facebook page created for this purpose.

The research main findings were as follows:

Land development in West Bank:

Area of reclaimed land averaged 16 dunums¹, with minimum of 1 dunum and maximum of 245dunums, while the mode was 10 dunums. The costs of reclamation in 63.8% cases are co-funded, while 27.6% of farmers reclaimed their land from their own resources, only 8.6% are totally funded through implementing agencies. Almost all farmers in the targeted area cultivated reclaimed land. Fruit trees are the dominant crop forming 91% of cultivated land. Olive trees and stone fruits are most preferred to farmers. Only 38% of farmers indicated good land productivity while for remaining farmers productivity ranged between acceptable and low. However, 89% believe land reclamation is economically feasible. Crop selection is done according to farmers choice, only 24.8% of farmers rely on agricultural extension recommendations for crop selection, but only 7.2% pointed that they follow donor/implementer's guidance. After the end of the reclamation process and the termination of the donor's role, 54% of farmers claimed receiving no advice from agricultural extension agents. This occurred at a time when 92% stressed their need for technical support.

¹ Dunum= 1000 square meters

Knowledge Sharing methods:

Farmers vary in their preference of the tested five methods. It was not easy to have clear cut comparison between methods. However, sample farmers tended to prefer methods with face-to-face communication, than ICT methods like social media. With better preference to conferences and then video screening in farmers meetings, while ICT methods were less acceptable by majority of farmers. The survey showed that all methods were effective in conveying messages with slight variation. At the same time, lower percentages (25-59%) indicated that they applied what they acquired (lowest for documentary film and highest for SMS).

Within the farmers' conferences and the video screening sessions, participants highly rated storytelling either directly by the farmer, or through video documentation, photo presentation, expert/ extension agent presentation as well as the local folklore "Zajal" in conveying agriculturally-germane messages. Highest rating was given to video storytelling and Zagal, while the lowest was given to experts' presentations, despite them being well prepared and relevant to the subject at hand.

Social media was not highly preferred amongst farmers in general as most of farmers were not familiar with the necessary technological skills. However, computer literate people were in favor of ICT. The project's Facebook page attracted over a 1,000 members. The overall views of the 19 videos uploaded to the project's Youtube channel exceeded 24,500. Around half of this number is attributed to the high number of viewings of one video. this is a how-to video about strawberry planting. The video featured new technologies that are novel to farmers in this region, the video went viral, attracting around 13,000 viewers in six months only.. The second most reached 3000 views, while the third popular video reached around a 1000 views and it focused on a female farmer's success story home gardening. With regards to the project's Facebook channel, the average reach of each post--photo, video, or a status update was more than sharing on the site. Members' contributions through "sharing, commenting and liking" were generally modest.

Results of the project's team evaluation are concomitant with results of the external evaluation with slight variation in ranking of sharing methods.

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Acronyms

ANERA	American Near East Refugee Aid
CBO	Community-Based Organization
ESDC	Economic & Social Development Center of Palestine
FAO	U.N. Food and Agriculture Organization
ICT	Information and Communication Technology
IDRC	International Development Research Center
IFAD	U.N. International Fund for Agricultural Development
KS	Knowledge Sharing
LRC	Land Research Center
MENA	Middle East and North Africa
MoA	Ministry of Agriculture
NGO	Non-governmental organization
PARC	Palestinian American Research Center
TAC	Technical Advisory Committee
UAWC	Union of Agricultural Work Committees

2- The research problem:

One of the most important recognized strategies for combating food insecurity in Occupied Palestinian Territory (Opt) is bringing more land into cultivation by reclamation of mountainous areas. Many local and international organizations funded and implemented land reclamation projects for the benefit of individual farmers. In the last 10 years, the area of reclaimed land was estimated at over 80,000 Dunums (8,000 hectares). Total expenditure by farmers and donors on land development projects implemented until 2006 was estimated to exceed \$150 million. Program managers in MoA, and the major Palestinian organizations that implement agriculture projects estimated the average percentage of cultivated land to be between 50-60% of the reclaimed land, this was a rough estimate without any statistics.

On the other hand many farmers have great success stories in reclaimed land, if documented it is strictly for reporting purposes. Knowledge sharing efforts in Palestine are *ad hoc*, and never felt significant in country. This happens while at the same time when the importance of knowledge sharing to address the global crisis of food insecurity and global warming is being recognized by international organizations. Traditional media and emerging ICT technologies have been used very successfully in developing countries to disseminate information on important agricultural issues.

This research was designed to promote Knowledge sharing to improve use of reclaimed land and at the same time evaluate five known knowledge sharing methods among farmers.

Research questions were:

- What are the best knowledge-sharing (KS) tools and methods to convey messages to farmers who are developing their land?
- How can KS enhance food security by better utilizing existing experience?
- What role can farmers play in KS and transferring knowledge to their family using ICT?
- Does targeting women in KS affect the utilization of developed land?
- What is the role of KS methods in informing researchers and decision-makers about the needs of small scale farmers

3- Progress Towards Milestone:

Milestone 1.1 :The baseline survey:

for the purpose of studying the socioeconomic and knowledge status of sample farmers before intervention the research team conducted a baseline study at the beginning the project. A consultant was hired to review research tools, supervise the data collection and analyze the data. The study acted as a baseline survey for the research and a reference for selecting beneficiaries. The results of the survey was used in sample farmer selection (95 farmers out of 114 studied farmers), and used for comparison with end of project evaluation

Milestone 1.2: Shareable Material

The project's team collected raw material from the field and contacted many organizations to have their available documented knowledge material. Prior to implementing the project, it appeared that the number of readily available material was limited to one irrelevant video. However, there was agricultural extension pamphlets in various topic but none as electronic copies were available. Other than printed manuals on land development, anything in press is scarce and of little interest to farmers. Therefore the project team had to produce own material carrying messages to promote land reclamation and improve land use practices such as intercropping, soil moisture conservation, supplementary irrigation, and diversification of crops. The focus was on short videos, while printed material was requested from organizations. However, written success stories and PowerPoint presentation were made special for the farmer conferences either by farmers or by extension agents from the ministry and NGO's.

During project's life nineteen short videos were produced by the project's team, in addition to the documentary produced by an external consultant (25 minutes). Hours of raw footage are available for further use. Each video carries messages from a farmer to his peers with the aim of encouraging farmers to better use their reclaimed land.

Palestine KMKS Youtube Channel:

<http://www.youtube.com/user/KMKSPAESTINE>

The Documentary

The major knowledge material to be shared is the documentary about land reclamation in Palestine. A consultant worked closely with the research team and partners and use the material already gathered by the team to end up with a documentary of 25 minutes long. The original plan was to produce 3 episodes of 45 minutes each, but the TAC indicated that it is better to sum everything up in one comprehensive piece and 45 minutes would be long,

It is also important to note that producing 45 minutes onscreen would have cost an exorbitant amount, beyond what the budget allows for. The footage gathered by the filmmaking consultant was also used by the team to produce short videos to share. Copies of the documentary and videos were distributed to partners to be used in future farmer training.

The [documentary](#) film was aired by Al Quds Educational Channel (local/cable) on May 9th of 2013, Wattan Satellite TV, and twice on the Palestine State TV (satellite): once on August 12th, along with an encore screening on September 5th. The screening of the film was advertised through SMS that was sent on behalf of the MoA for a wide range of farmers on their list for such service, including the research farmers targets. Furthermore, the film is also currently available on youtube in high-definition. It has been shared through the Facebook site as well. (<http://www.youtube.com/watch?v=RBUtRBtAVn0>)

Online activities:

A [Facebook page "Palestinian' Cultivate your land"](#) was created and fed with shareable material in early August 2012, and the page has since grown exponentially in size. It is updated regularly with shareable material. ANERA will keep updating the page after the end of the project. Most of the material includes the videos that were produced by the project's team and uploaded to Youtube. The point of using Facebook is to enable further sharing of material via online tools. It has been observed that each video usually has multiple organic shares, enabling it to be viewed in many different places. This page was linked to the ministry of agriculture main portal, this portal was developed by MoA as Umbrella for all ministry websites.

Equally important, it has been observed statistically that the website grew in size after each of the training sessions or the conferences. Such events were exploited to announce and advertise the site and the project's material even further. It has proved to be a successful marketing strategy. More details on dissemination of information through Facebook will be explained in section #4.

Milestone 1.3 Farmer conferences:

As a knowledge sharing methods, two farmer conferences were conducted in Ramallah as a central city for West Bank. **The first conference** was held fall 2012 with 111 participants of which 62 farmers, agronomists, and representatives from local and international NGOs. The conference was held under the title, "*Palestinian: Cultivate Your Land*," and it featured several success stories presented by farmers and agronomists alike. One of the conference's main goals was to empower local farmers to share their expertise and their latent accumulated knowledge with one another. To this end, four short documentary films-

- produced by ANERA's KMKS team, were showcased. As the conference's conclusion approached, five agronomists from local and international NGOs, along with representatives from the Ministry of Agriculture, presented scientific research papers on several issues related to land reclamation, most of which were designed to help farmers grow more economically-feasible crops, and utilize their lands to increase the marketability of their produce.

The **second farmers' conference** was held under on May 10th the title "*Farmer Knowledge is a Treasure*" with the logo "*the best fertilizer of the land is farmers' feet*". Audience were over 126 persons of which 94 were farmers, which exceeded the number of the initially distributed invitations as it was announced on the facebook. The Minister of Agriculture, attended more than half of the conference time. Five videos were presented on various topics: financially feasible crops, biodiversity in land reclamation, strawberry cultivation in greenhouses, and, water harvesting via greenhouse rooftops. Agronomists also presented information on how to preserve organic seeds and how to improve financial means through land reclamation. Also, despite its simplicity, a ground-breaking story on the success of a female farmer in improving her family's standard of living through a small home garden and water well was presented as a short documentary. Attendees responded very enthusiastically to gender diversification and the role of Palestinian women in successful food-security. By the end of the conference, attendees were asked to fill out evaluation forms. Success stories were specifically selected to disseminate agricultural knowledge in various facets of the field. Videos, PowerPoint presentations and verbal discussions were all tailored with one specific goal in mind: the potential for replication and further development, and wider dissemination of agricultural knowledge.,

Milestone 1.4: Knowledge Sharing Competition:

In order to encourage farmers and people working with them on documentation a competition for documentation of agricultural knowledge-sharing was announced in official newspapers, the first conference the facebook page as well as in the two schools of media in two universities. As well as through three other widely accessed online portals.² The goal of the competition was to draw several submissions and to document knowledge in the field of land reclamation in Palestine. The creative approach itself was very open-ended: competitors were encouraged to submit a short film, a written document, a poster, a slide show, or any creative approach that is easily disseminated. Four months were given for submission. Twelve people expressed their interest in submitting a document for the competition. But by the deadline only six people sent their submissions to ANERA. The

² <http://www.najah.edu/ar/print/5631>

remaining six competitors withdrew, citing various reasons like lack of time and facilities, farmers they thought about refused to cooperate.

The submitted documents were evaluated by a committee of five members including 3 agronomists and two filmmaking consultants. The research team designed a very specific rubric to all evaluate all six submissions. The rubric included elements like the type of document, the subject, content, clarity, and the length of the document, and the ability to share it, along with the overall impressions of the evaluator. The results yielded the following:

1- Top prize for Abdallah Abu Draz from Gaza; a short film on the use of sheep's wool to preserve soil moisture. 2- Second Prize for Ms. Fida Ataya-- a short documentary on Land Reclamation/General. 3- Third prize for Mr. Shehda Ziyadat-- a written document on fertilizers of reclaimed land using natural material. The submissions were generally mediocre or below in their quality, which proved the dire need for further training in documentation and knowledge sharing methods. The prizes were distributed during the closing ceremony of the second farmers' conference.

Milestone 1.5: Training

Training, Farmer workshops and meetings: Nine training workshops were conducted from the period ranging from June 2012 until April 2013. These included: instruction on the use of social media, disseminating concepts of KMKS, and discussing how improve agriculturally-germane issues via the implementation of knowledge sharing using available technology tools. The six training sessions can be rightly divided into two distinct categories.

- 1) **Social media startup sessions:** During the early phases of the project, three area-specific workshops were organized to expose farmers/the beneficiaries of the project to necessary social media/Facebook literacy. One workshop was held in Nablus, one in Hebron, and a third in Biddo/ Ramallah for farmers from the East Jerusalem zone. Some of the initial predicted risks were true: there were serious concerns about computer and internet literacy and not all farmers have the necessary access to internet. The proper percentages of internet and computer literacy are thoroughly reflected in the baseline survey as well as in the final evaluation. Furthermore, there was little turnover in most of these sessions, as most farmers responded with lukewarm enthusiasm to learning about internet and Facebook and considered an issue associated with the younger generation. Statistics are reflected in the research report.
- 2) **Knowledge sharing training sessions** (on-site video screening): six training sessions were conducted to both male and female farmers. The sessions were organized in Bet Ommar (Hebron), Asseera (Nablus), and Bet Doqqo (Jerusalem Villages),

respectively. Each session was organized in the community center of the village. Initially, only the project's beneficiaries were invited to attend these sessions along with their wives. However, most of wives were not able to attend. Instead, active women from the community center were invited. Most of these women have valuable experience in agricultural and are socially enabled to attend such events. Therefore, exposing them to knowledge sharing methods was part of the process. The general purpose was to screen the videos that were produced as part of the project and discuss the same preferred methods with the women, as well. Evaluations were filled out and reflected in the final research result. Five films were screened in each training session. They were selected according to their regional and geographical relevance, as well as the potential interest level.

Milestone 1.6: End of project evaluation:

An external evaluator was selected to assess the project's results and measure the effectiveness and impact of various knowledge-sharing. The evaluation methodology involved a mixed method approach, including a survey of all beneficiary farmers and in-depth interviews with a purposive sample of farmers and Project stakeholder organizations over a course of two weeks extending from 3-20 September 2013. The project's baseline and progress reports were heavily tapped by the evaluator for triangulation purposes. External end of project evaluation report is attached in annex (4)

4- Research Results.

The research was conducted to achieve four specific objectives the first was the main objective which is much related to research questions, while the others came as a result of the activities.

First Objective : Identifying the best of the tested five practices and methods for knowledge sharing among small-scale farmers: Towards this objective, the project's team documented farmers success and tacit knowledge in 19 short videos which amounted to a total of 135 minutes, which include a documentary about land reclamation. In addition to farmers' stories, agronomists from the project's partner organizations prepared agriculturally-germane knowledge material to share with others. The sample of 95 farmers was exposed to five knowledge sharing methods during the research period, listed below:

- 1- Free online sharing of material;
- 2- inviting farmers to watch sharable material in their respective areas;
- 3- television program;
- 4-farmers' conferences;

5- On-site farmer wives' meetings.

In addition to these major methods, some other Knowledge sharing methods were tested as well, these include presentations by agronomists, photo presentations, and live oral storytelling by farmers.

When farmers were initially asked to allow their wives to participate in on-site meeting in the baseline survey, a positive confirmation was at 82%, though when it came to real-life implementation, this was not the case. Most farmers were conservative and did not allow their wives to participate in these workshops, at all. The best viable and successful alternative was to find women who were active through their local community and gender centers in their respective villages.

Regarding agricultural television programming, the original plan was to produce three 15-minute episodes,, but the Technical Advisory Committee indicated that it is better to sum everything up in one comprehensive piece. Moreover, it was later discovered that even 45 minutes would be too long and burdensome in terms of cost, which would have exceeded the budget line. Therefore, a documentary of 25 minutes was produced and broadcasted in main TV channels.

The short mobile messages (SMS) method was used instead of farmer wives meetings method. SMS were used to either convey agricultural knowledge messages or to notify farmers about other project activities.

The five methods were evaluated qualitatively and quantitatively through focus group discussions (FGD). Questionnaires were also filled out as part of the final evaluation survey, and after each activity conducted on certain specified dates (conferences, video screening session, a special evaluation form was filled out by participants. For social media, a special synthesis was done to monitor members' activity. In the FGD, two methods were used to rank and compare between methods: pair-wise ranking, and direct matrix ranking.

Results of FGD showed that there are difference in farmers' preference of the methods, with general ranking as follows (best to least preferred): farmer conferences, screening of videos in farmers meeting, TV broadcasted documentary, social media (online sharing through Facebook) and , least,SMS. In the FGDs it was noticed that most farmers who are good in using computers were in favor of social media. Taking into consideration that only 17.7% of farmers were members of the project's Facebook page and the farmer and technology data presented in figure (1) show that still Palestinian farmers who reclaimed their land are still far from using ICT for acquiring knowledge.

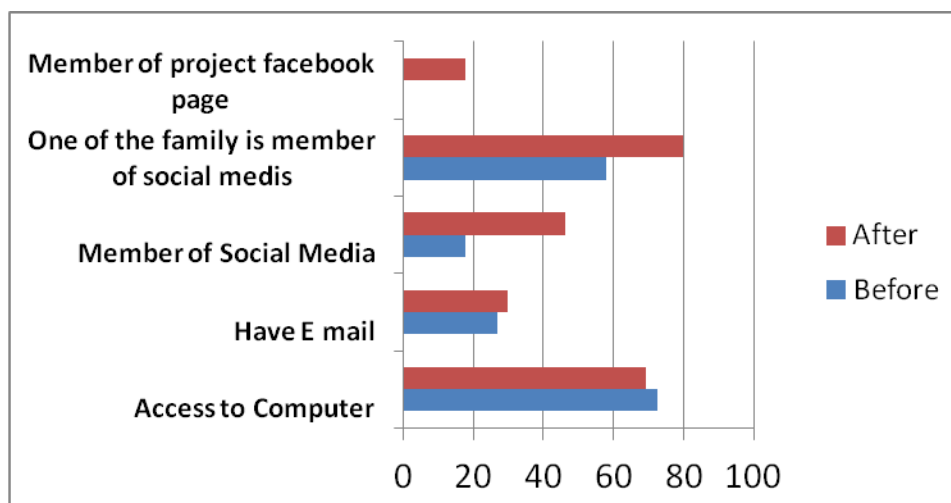


Figure (1): Farmers with ICT characteristics (Percentage)

In the final survey, the majority of farmers acknowledged the role of video screenings in farmers' meeting at (42.3%), farmers' conferences constituted a second preference at, (39.7%), while 17.9 % preferred SMS and TV. Nobody voted for Facebook page.

For direct matrix ranking a set of criteria was prepared and agreed with farmers during FGD to rank the different methods. In each area FGD was held with 6-10 farmers who were known to be exposed to the majority of methods. Criteria included: Type and magnitude of shared knowledge, ability to use and accessibility, the cost, time needed to get knowledge, interaction with peers, possibility of handling and re-sharing with others, and possibility to store knowledge for future reference. In the last FGD, one farmer noted the exciting nature of the conference as an important criterion. Results of the discussions showed great variation among different groups. Generally speaking, though, the majority of interviewed farmers preferred conferences and meetings of farmers in their areas and attributed that to the ability to interact face to face with peers, and the nature of the conference method itself is exciting, however it could cost the farmer time and transportation if it was not sponsored. While people with ICT good ability and internet access and knowledge preferred social media, in terms of accessibility, storability, ability to share, cost and time needed to ascertain knowledge.

The beneficiary survey showed that with slight variation all methods were effective in conveying messages and helping farmers in acquiring knowledge. The information may not necessarily be new or complex, but it is successful in its retention.

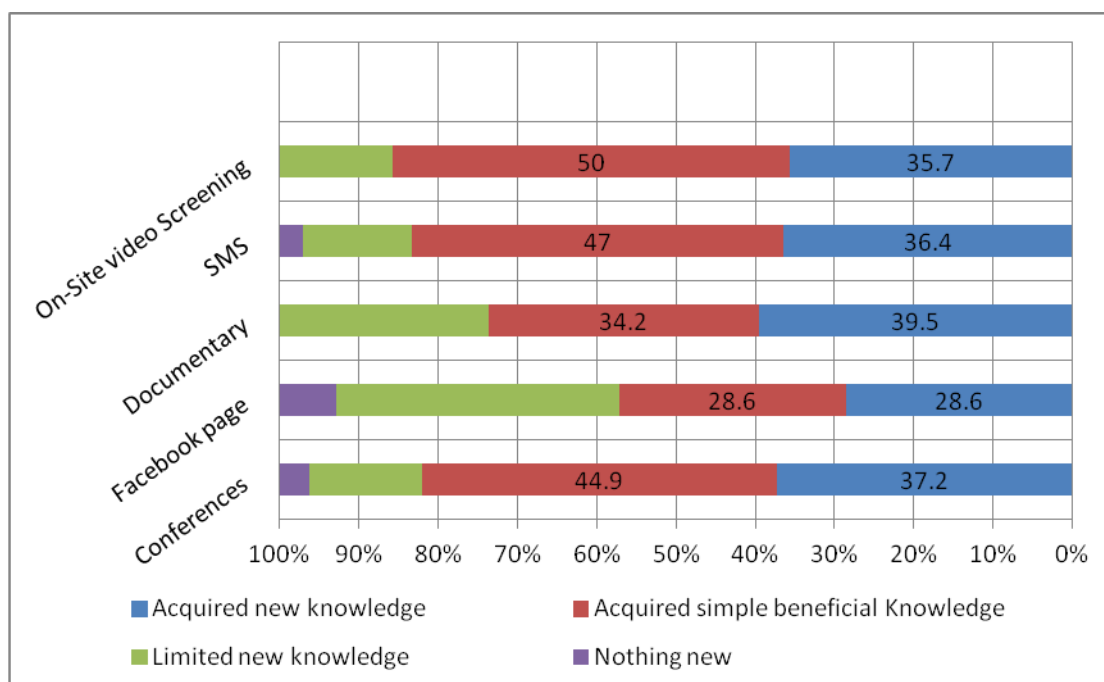


Figure (2): distribution of project targeted farmers according to their assessment of the level and quality of knowledge they have acquired as a result of being exposed to various KM tools.

At the same time low percentage of farmers indicated that they applied what they gained. Higher percentage was given to SMS. This could be explained by the very specific and short direction given to farmer in the messages therein. In the evaluation meetings farmers gave examples of new knowledge they acquired like using of natural sheep wool to conserve soil moisture, others indicated that intercropping was a new for them and others pointed supplementary irrigation as a novel concept and they applied it this year, especially for olives.

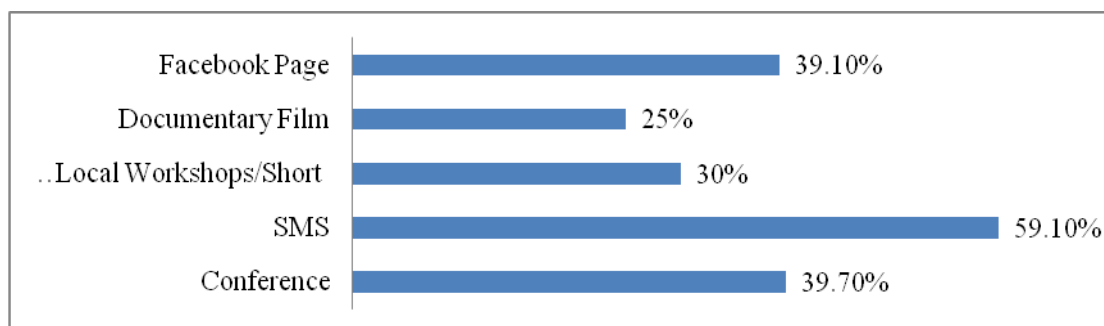


Figure (3): Percentage of farmers indicating application of knowledge they gained through the various knowledge sharing tools.

Evaluation of single methods:

After each conference or meeting to screen videos, an evaluation was conducted through a special questionnaire tailored to each event. Inside the conference other knowledge sharing methods were evaluated as shown in Figure (4).

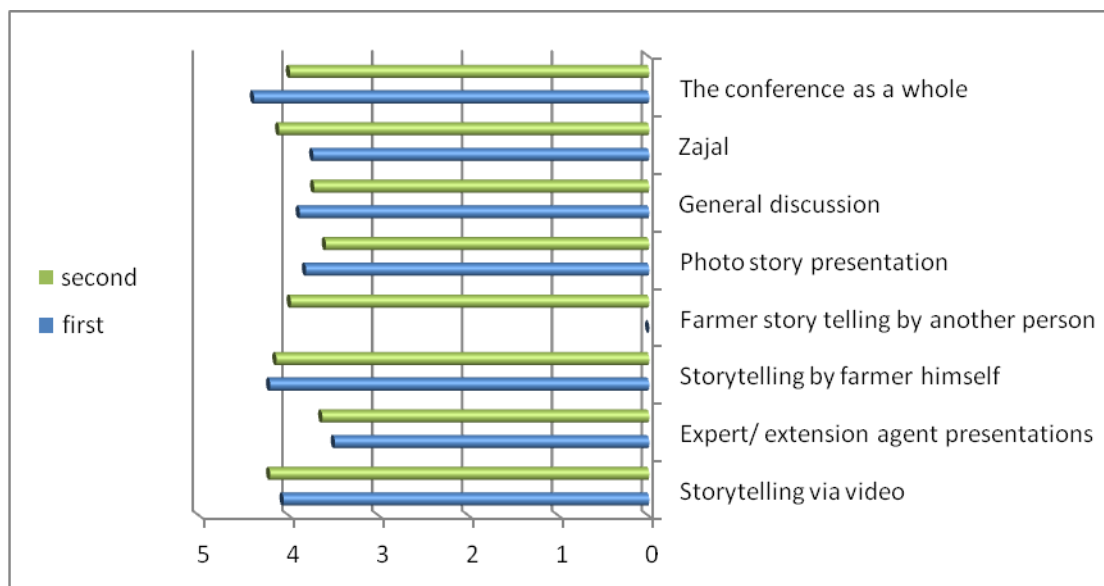


Figure (4): Evaluation of knowledge sharing methods used in farmer conferences.

The figure shows that in general farmers gave good rating for all activities with great preference for material presented by the farmer himself directly or through documented video. The lowest preference was given to expert/ extension agents presentations despite the long experience of presenters and the high quality of topics. Palestinian traditional folkloric lyrics. Zagal was utilized to convey technical messages (agricultural knowledge) for better use of reclaimed land and as an icebreaking start of the first conference. Messages conveyed via Zagal were prepared by the researcher and approved by TAC, while the Zagal performer presented the lyrics through his engaging style. While in the second conference "Dabbkeh/ folklore dance" was used. Participants gave higher rating for Zagal as it carried clearer messages and was more engaging.

Other evaluation criteria of the conference are shown in figure (5). Results show the eagerness of farmers to document their stories, and they almost totally recommend repeating such conference. More than 90% indicated at the end of the conferences that they received new knowledge, however in the end of project evaluation around 80% indicated that they got new knowledge either simple beneficial or new to them (figure 3).

In farmer meetings, participants gave a higher rating to storytelling through video (4.58/5.0), all participants in all workshops recommended repeating such meetings with similar knowledge material.

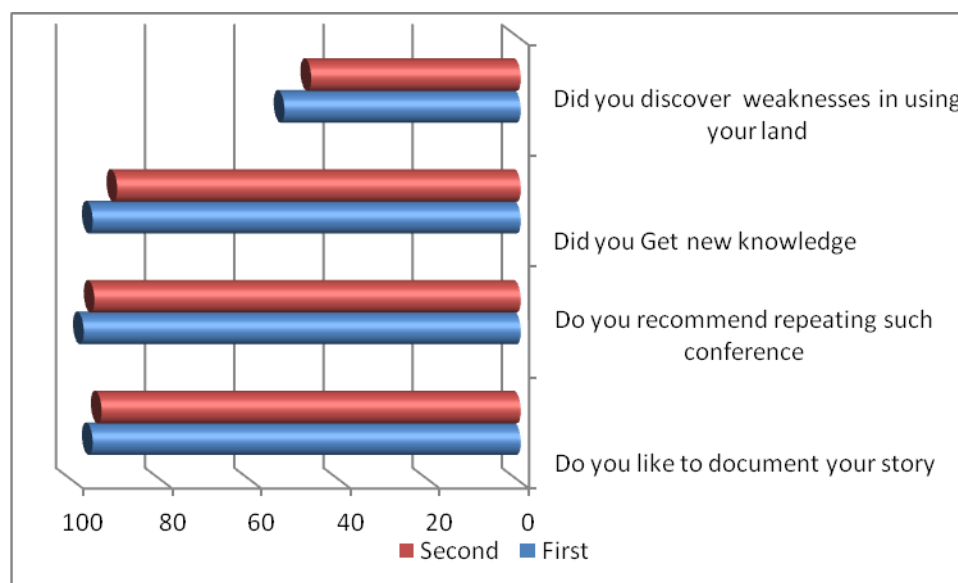


Figure (5): Other evaluation questions for farmer conferences

Social Media Statistics

The overall Youtube views for the project's channel have exceeded 23,000 views at this point, though generally most of the videos have spread organically rather than virally. However, there is one video that spread virally, with views exceeding 11,000 at this point. In other words, this one video almost accounts for 50% of the views of our channel-- in contrast to 18 other videos.

The reason why this video spread virally could be related to the fact that it presents a groundbreaking methodology in planting a high-value crop strawberries. Furthermore, the nature of the video itself is different: it does not merely narrate a success story, but rather, teaches farmers how to implement the same farming strategies. In other words, it is safe to say that this particular video has the highest imitation and replication value, intrinsically speaking. The video was also uploaded to Facebook and Youtube in February of 2013. Though some others were uploaded at least 6 months prior to that date, they have not been as popular.

The [second video](#) reached around 3,000 view it describes almond cultivation, while the third most popular [video](#) presents a story from a female farmer. It narrates her success story in creating an economically sustainable home garden in a reclaimed land, which improved her

family's standards of living. It also went viral, but not as much. It was uploaded in December of 2012 and has attracted more than a 1000 views so far. Unfortunately, Youtube does not provide gender statistics because not all viewers are registered. The only aspect that is different about this video is that it targets people interested in home gardening and females, but does not present new technologies, unlike the video discussed above. The remaining videos averaged around a 100 views, each.

The Facebook page has attracted over a 1000 views up to the date of writing this report. It has been generally used to promote the videos and the photos produced by the project, but have not caused any viral movements. The Facebook data information exported by the page itself indicates that all video as photos spread organically. The only viral spread via Youtube is through search results, as explained above.

With regarding to the popularity of videos, photographs, and informational status updates on the Facebook site, refer to the graph below:

Table (1): Evaluation of facebook page " Palestinian' Cultivate Your Land"

	Reached	Shares	Comments	Likes
Status update	155	0.4	1.5	4
Videos	107	0.6	1.3	4.6
Photos	138	1.5	2.4	8.6

"reach" refers to the number of views,

"shares" refers to information potentially going viral through multiple posts through the pages' members.

Comments and likes refer to people reacting to posts,

Table (1) shows that responses stay limited to the page itself and do not cause any external activity. It is no surprise that the numbers are generally similar to the views on Youtube. For instance, the average number of reaches given by videos is around 130 views on Facebook, which is very close to the average number of views on Youtube. The project's Facebook, hence, only promoted organic activity.

What is also important to note, however, that neither the Facebook site nor the Youtube channel were ever monetized. Equally important, the project did not use Facebook's advertisement options to promote the site. The 1000 members of the page were simply attracted through word-of-mouth and meetings, workshops with farmers, project beneficiaries, and though the conferences and SMS.

Second Objective: Build the capacity of 90 beneficiary farmers, and their wives through exposing them to knowledge in best utilization of developed land, by involving them in 18 days of training and knowledge sharing events.

Since majority of farmers refused the attendance of their wives in such meetings, this part of the objective was not possible, however, and as explained earlier, other women were targeted.

The sample of farmers (95) as well as 55 women who attended the three video screening meetings were exposed to documented knowledge. Key messages involved in documented material focused on best practices to use reclaimed land, this included but was not limited to supplementary irrigation, intercropping, diversifying crops, soil moisture conservation, water harvesting, disease and pest control. In some of the documents innovations were documented, the best example was the use of wool to conserve soil moisture, an idea that was documented by one of the applicants for the documentation competition. During evaluation, Murad Jaber, a farmer from Beit Soreek village/Jerusalem indicated that he tried it and found it successful. This is just an example many others indicated using the supplementary irrigation and using intercropping for the first time. Women showed more interest and interacted more than men.

Figure 2 showed that high percentages of farmers acquired knowledge if not new but it was simple and beneficial. While figure 3 showed the percentage of farmers applying the knowledge they acquired, although not high but there was some adoption.

The videos and other printed material produced documented knowledge in the context of the research project are valuable assets. It enriched youtube with Arabic material. Partner organizations have access to this material and can use it in their training. All the material is available online and accessible. It is also worth mentioning that before the project's start, documented material in Arabic was incredibly scarce, as far as online resources are concerned. Only one non-germane video was available on Youtube.

The research team including the researcher, the assistant and the media director at ANERA, have been exposed to a new experience in a field new to the area. The technical Advisory Committee including 9 persons from the ministry of agriculture and 5 main NGO's, while giving guidance and support to the research team formed a community of practice in knowledge management. The KMKS terminology and strategy entered their organizations This could be a start to any future endeavor in this field.

Third Objective: Enrich the Palestinian land development media archive with a minimum of 120 minutes of short videos, clips showing local experience of farmers.

During project's life, 18 short videos with total of 110 minutes were produced by the project's team, in addition to the documentary produced by an external consultant (25 minutes). Hours of raw footage are available for further use. Each video carries messages from a farmer to his peers with the aim of encouraging farmers to better use their reclaimed land. All videos were uploaded Palestine KMKS Youtube Channel and posted to facebook page. (*list of videos and their online links attached*):

<http://www.youtube.com/user/KMKSPAESTINE>

Fourth Objective: Create a documented reference of land development in West Bank describing the reasons behind the low efficiency of land development projects, and describing the role of knowledge sharing solving the problem

To achieve this objective the baseline survey and the end-of-project evaluation were conducted using a special questionnaire developed for this purpose and reviewed by a statistician. The baseline survey was conducted April 2012, while the evaluation was conducted September 2013. Having this section in the report will form a reference for describing the land development status in West Bank.

Land development status of the studied sample of farmers:

Results showed that 65% of the sample farmers depend totally on agriculture for their livelihood, while 35 % have agriculture as a second source of income, this indicates the efficiency of targeting real farmers in land reclamation projects. On average 41% of farmer income comes from agriculture. The average area of land owned, cultivated land, and reclaimed land are shown in figure (6). The percentage of cultivated land and reclaimed land are proportional, have the same trend in different areas. Average reclaimed land in different area ranged between 9 and 14 dunums in all areas except Tubas, where the average was 47 dunums. This is true as Tubas is known as the town of widest owned areas in West Bank, and many farmers reclaimed wide areas on their own.

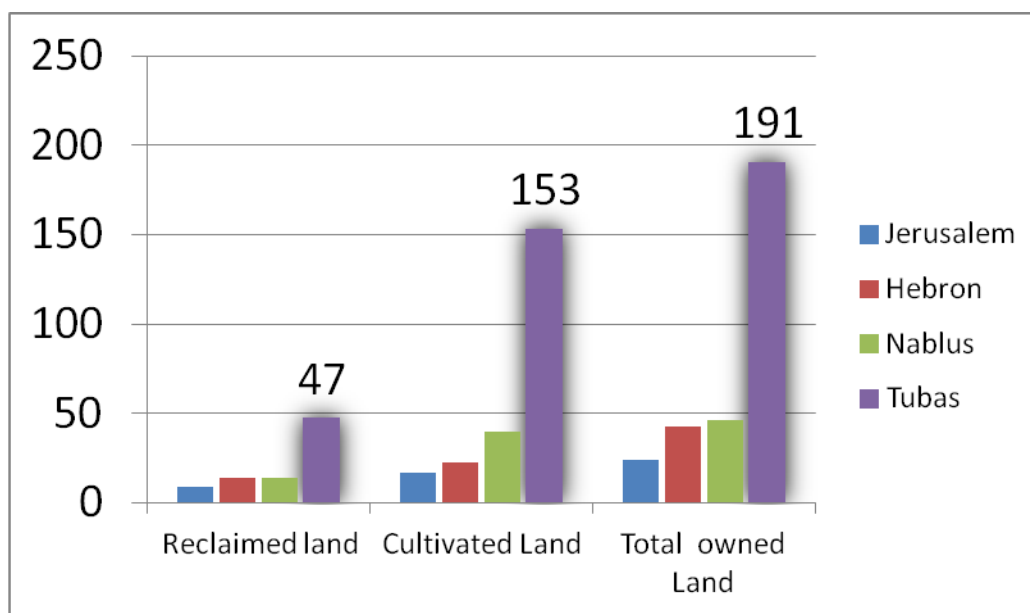


Figure (6): Average area of land owned, cultivated and reclaimed for sample of farmers

While for the average of all areas was 16 dunums, with a mode of 10 dunums, minimum is 1, while maximum is 245. Farmers with wide areas of reclaimed land have agribusiness and majority of the fund was from their own resources, however, they were assisted by the ministry and/ or the NGO's.

Source of funding for land reclamation: farmers usually receive fund to reclaim their land. Funding is most likely contingent upon farmer's contribution, in some cases (8.6%) the farmers did not contribute to reclaiming their land as cost sharing was not required. However 27.6% of farmers indicated that they reclaimed land from their own sources (figure 7).

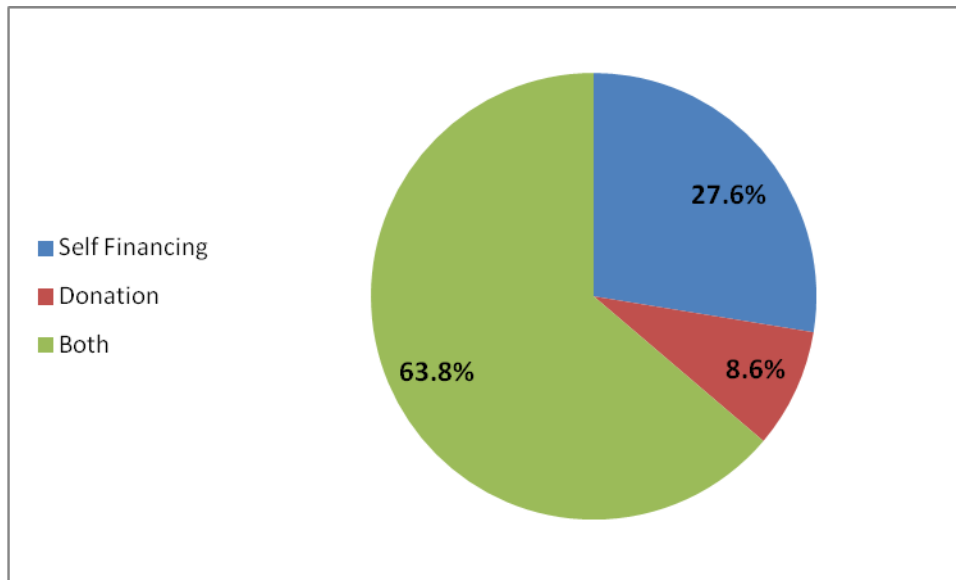


Figure (7): Source of funding for land reclamation

Utilization of reclaimed land:

The study showed that 98% of targeted farmers cultivated their reclaimed land. This is contradictory to early estimates done during designing the research which pointed 40% not using their reclaimed land. Fruit trees are the dominant crops and grown in (91%) of reclaimed land, of this percentage 28% are practicing mixed agriculture (fruit trees and vegetables or field crops, while only 6% use it for vegetables almost all those farmers are located in Tubas area and have ground water sources to practice irrigated agriculture (figure 8).

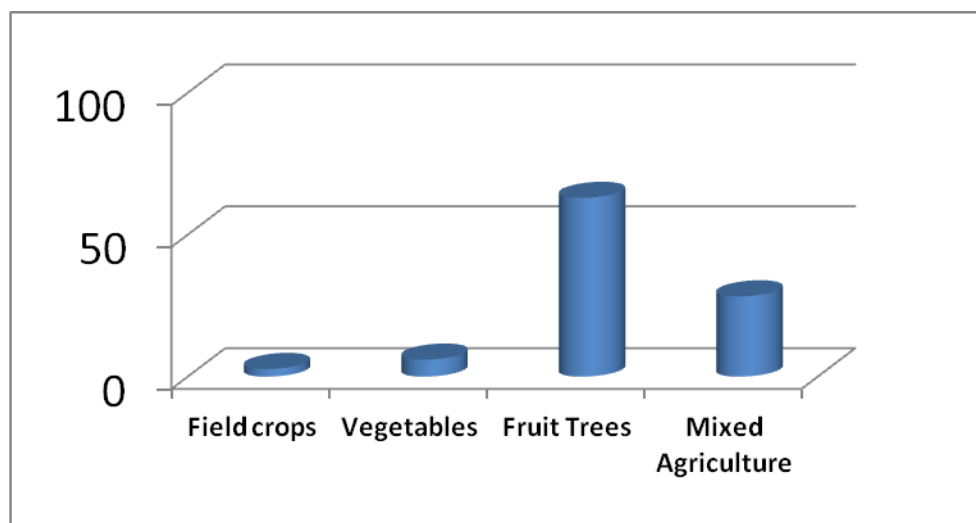


Figure (8): Crops cultivated in reclaimed land

Majority of farmers (87% are satisfied) with the crops they planted, and even 68% of them will plant fruit trees in any reclaimed land in the future. Only 1% indicated that they will grow vegetables. However, 31% of farmers indicated that the productivity of land is low same percentage said it is acceptable, and only 38% indicated it is good. Reasons behind low productivity were mainly lack of water for irrigation, low rainfall, pests and diseases, and some mentioned that plants are attacked by animals (wild and herding) as the reclaimed land was not fenced.

From farmers perspective 89% indicated that land reclamation is economically feasible and participated in improving their income and hence their food security

Majority of farmers prefer planting olive trees and stone fruits especially apricots. However, many crops were mentioned like quince pears, cactus and irrigated vegetables as their favorite profitable crops. Crop selection is done according to farmers experience and family consultation in 68%, while 24.8% follow extension recommendations and only 7.2% indicated that they are governed by what seedlings the donor/ implementer offer.

Farmers generally take care of their cultivated crops. They plow, prune, use pesticides when needed and add fertilizers. Water harvesting is done by 75% of farmers using cisterns, while only 65% use supplementary irrigation, and here they refer to irrigating trees in the first few years after planting.

Technical support, extension and knowledge sources:

Agricultural extension through the traditional visits practiced by the ministry of agriculture Figure (9) remained the main source of knowledge for farmers who reclaimed their land (64%) while donor/ implementer provided extension for 12.2%. However, 14% indicated that they did not receive any extension. This applies during the land reclamation period, while after finishing the reclamation project 54% of farmers claimed receiving no extension or technical assistance from any organization. This fact comes at a time when only 30% of farmers assured that they have good experience to run their farming while the remaining percentage (70%) deemed the need of technical guidance, and 92% of farmers stressed on their need of technical support after the end of the reclamation project. They either ask it from the ministry of agriculture (66%) or the funding and implementing agencies. This deems the need for effective extension to improve use of reclaimed land.

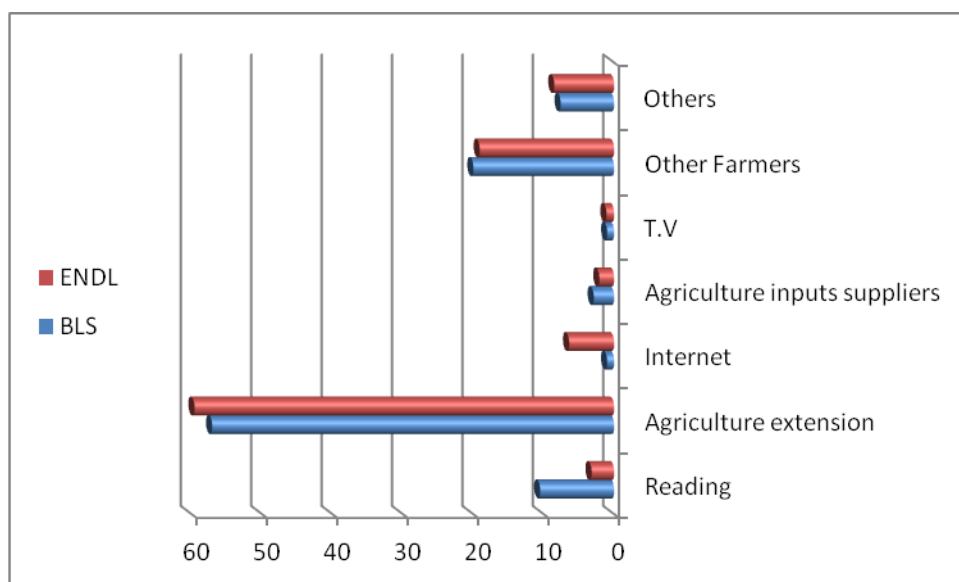


Figure (9): Source of agricultural knowledge for farmers

The family as a whole participates in farming decisions in 90,4% of cases. In both the baseline and the evaluation around 80% of farmers assured that they involve their women in decisions mainly related to what to plant, agricultural practices and marketing.

5- Synthesis of Results Towards AFS Outcomes:

The research project fits with four AFS outcomes those area:

Outcome 1: New technologies and/or farming systems and practices.

The overall value of the project is mainly associated with knowledge documentation and dissemination. It didn't develop technologies per se, rather it contributed to sharing of new technologies and practices. The uploaded videos to YouTube, Facebook and other shareable material have provided a solid base for the Palestinian agricultural information on the web. Furthermore, other agricultural organizations, such as MoA and the five partner NGO's, have followed in the project's footsteps and began uploading information and other shareable knowledge on their websites. The outputs from the knowledge sharing competition is also available. Equally important, the two conferences have created several opportunities for networking knowledge sharing amongst farmers from different areas. Figure (1) shows that 37.1% of sample farmers acquired a lot of new knowledge related to agricultural practices, while 44.9% acquired little beneficial knowledge.

Messages in the produced material focused on new practices for improving utilization of land and water. The percentage of farmers who indicated that they applied what they acquired averaged 39.7 % (Figure). Supplementary irrigation proved to be the most adopted method (Figure). It increased from 65.2% In the baseline to 83.9% by the end of the project.

The video about strawberry production³ with soilless culture was viewed around 13,000 times. Gaza strip, which is totally isolated from the West Bank, contributed to the project with two submissions for the documentation competition one of them got the first prize. All communication was conducted through ICT.

Outcome 8- Access to resources:

The tested knowledge sharing methods could be all considered agricultural extension activities, especially directed towards improved use of agricultural production. Although the impact of project activities on food security was early to be tested but it could be improved as a result of adopting practices like intercropping and supplementary irrigation. Those practices were pointed as the main means of improving profitability of reclaimed land in the Cost Benefit Study conducted 2006 by UNDP.

³ (<http://www.youtube.com/watch?v=pznV6DoRg0A>)

Outcome 11- Information and Communication Technologies (ICTs)

The project provided opportunities for the beneficiaries to learn about social media and to advance their knowledge in the fields of ICT, so long as it is relevant to the project's outcomes. To this end, three startup sessions in social media training were given in the three selected regions of the West Bank. However, attendance was not sufficient. Some involvement of Palestinian farmers on Facebook and Youtube has been an outcome of the project, as 17.7% of farmers became members of the project's Facebook page. Some films have also been virally shared across the web, reaching over 13,000 views. The channel itself has around 25,000 views, and project's Facebook page has so far attracted over 1000 members interested in farming. Champions from different areas shared their knowledge via the page. The 95 farmers were added to the ministry's list to receive short mobile messages (SMS) including extension recommendations, this was new for farmers and they valued these messages in the end of project survey and the focus group discussions.

Outcome 12: Gender:

The original design of the research included one method tailored to women, which was on-site farmer wives' meetings, where the assumption to be tested was that once women were exposed to knowledge they will convey messages to their husbands and contribute to better use of reclaimed land. In Palestine, it is generally known that most of agricultural work is done by women. However, when it came to implementation, the majority of farmers refused to send their wives to attend video screening sessions despite the fact that in the baseline survey 82% of farmers indicated that will have no problem doing so. The research team insisted on involving women through inviting 55 active women in the three targeted areas. Women showed more interest and enthusiasm than men. One of the documented success stories was for a woman called Huda Yusef Men and women alike praised her work during the conference. In the second conference, Ms. Yusef stood by the podium during the screening her video and answered questions from audiences. She was received warmly with laudable applause and encouraging reactions and comments.

Research results showed that 90.4% of farmers discuss farming issues with their families. Also 81.4 % of farmers indicated that they share their wives in decision making regarding farming matter, mainly in crop selection and marketing.

The long-term impact of the project is expected to last beyond the research's designated time frame. Documented videos could be used for a long time to come. Archival material is also available for further use. The project's team will continue to work for ANERA, which adopted knowledge sharing as a developmental strategy. The Facebook page will remain active and will be fed with knowledge through upcoming projects implemented by ANERA. The project's partnership with other NGOs will remain intact to enhance knowledge sharing in the region. ANERA will seek additional funding to employ research results.

6. Problems and Challenges :

The research faced major challenges:

- 1- The assumption was to find some available documented knowledge to start sharing it with farmers, but the team found it difficult to find specific pieces of videos or written material after all calls and requests to potential knowledge sources. Therefore, the team had to develop the knowledge material to share. This challenge resulted in delaying the first conference and the on-site sessions.
- 2- Setting the date of any activity with people was a big challenge, as they raised up the issue of agricultural seasons and being busy with farming. This caused the delay of activities. While farmers prefer Saturdays for meetings and conferences-- as part of them are employees and have free time on their weekend, employees with stakeholders prefer to avoid working during their weekends. This ended with lower presentation from organizations in major activities.
- 3- With regards to female participation, though only 18% of interviewed farmers rejected participation of their women in training sessions, during the actual implementation of the project and when calling them to invite their women to attend video screening sessions few of them agreed. However, a solution was devised. Female farmers who were active through women's community centers and cooperatives were contacted. They were able and willing to participate in the project.
- 4- Many organizations expected to be potential knowledge sources were absent from the research activities due to over commitment on their part as well as universities, who were invited to both conferences but did not attend despite all invitation and phone calls.
- 5- The concern of computer literacy, or lack thereof, was a valid one. The baseline survey showed that 73% have computer at their houses, only 27% have Emails, and only 18% have an idea of or use the social media, while another 58% have family members who own a Facebook account. This reality was expected, fellow farmers were contacted (by phone) to help their parents/relatives read/ watch shared material.

7. Recommendations:

1. The research team implemented the research with direction from IDRC office/ Cairo with enough flexibility and technical support to facilitate the implementation. The following are recommended for similar projects in the future:
2. The no cost extension for four months had its positive impact on exposing the sample of farmers to knowledge sharing methods, and gave the team enough time to conduct the evaluation. Such a research needs longer time or a larger sample of farmers to expose them to knowledge sharing methods and concepts.
3. The final report format does not support presenting research conclusions and recommendations related to the research itself .This addition will help the researcher to present better results.
4. Having a research with a novel nature and working on methodology that is not well tested before necessitates the need for sharing the methodology and results with peer organizations and colleagues from different areas. This for sure will be reflected on the research results and will contribute to learning within the network.
5. The sample of farmers should be narrowed to a limited geographical area, and to a narrower range of specialty within farmers.
6. Farmer conferences with farmers as keynote speakers are of high value in informing policy makers, researchers, private sector as well as method of knowledge sharing. The cost is not high, but the impact could be. Such activity is recommended.
7. An active way of sharing knowledge amongst IDRC projects should be implemented. The project's team is aware of IDRC's electronic libraries, and receive general updates from KariaNet website but there should be better communication and sharing among similar researchs through sharing progress reports.

Annexes

Annex 1: Monitoring AFS Expected Outcomes

Annex 2: Output table

Annex 3: Template for AFS Research Output Title and Abstract Page

Annex 4: External end-of- project Evaluation Report

Annex 5: Event attendance sheets (printed) originals appear in annex (2)

Annex 6: Baseline survey results

Annex 7: End of Project evaluation survey results compared to baseline