



Scaling up best practices for managing Awassi dairy sheep to small scale sheep farmers in West Asia

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Cover Photo: A herder and a farmer's daughter studying our guides at the LARI office in Terbol

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Executive Summary

This working paper presents an overview of the results of an ICARDA project to provide Awassi sheep farmers in Syria and Lebanon with the latest knowledge on best practices for managing sheep to improve their income. The project provided ICARDA the opportunity to actively convert scientific knowledge generated over many years into improved management practices and develop related extension materials for farmers.

The project planned to apply a two-phase approach for implementing the project activities in the two target countries, Syria and Lebanon. The majority of farmers' training and on-farm demonstrations were supposed to take place in Syria. After the completion of the extension materials and the testing of the implementation arrangements in Syria, a reduced training program was scheduled for Lebanon. The conflict in Syria resulted in the project being relocated to Lebanon. While this presented obstacles, the project was able to produce key achievements and develop materials that can be used in future farmers' trainings.

Key achievements:

- The series "*Best Practices for Managing Awassi Sheep*" was completed in Arabic and English and is available online. It includes eleven field guides; one guide on lamb fattening was added in response to the request from farmers in Syria and Lebanon.
- The six guides printed in 2011 and early 2012 were widely distributed in Syria (extension directorates, universities, IFAD investment projects); the feedback received was very positive and resulted in a demand for additional copies. The guides printed later were shared with the Integrated Livestock Development Project (ILDLP) and the Rural Support Program (RSP) implemented by Aga Khan Foundation in Syria and distributed to farmers, extension workers and other stakeholders in Lebanon.
- A full training program following the seasonal management cycle of Awassi sheep production was developed and tested in Lebanon from September 2012 to May 2013; eight training sessions were conducted targeting thirty pilot sheep farmers in the West of Bekaa Province.
- On request, an intensive training for 28 extension workers from the Baalbek El-Hermil Agriculture Department (MoA) active in the Bekaa Province was conducted and the extension agents were provided with all materials.
- Because of the huge interest of the sheep owners, a professional extension video demonstrating best practices for sheep health care was produced jointly by ICARDA and the Lebanese Agricultural Research Institute (LARI) in consultation with a Lebanese veterinarian.
- ICARDA developed an online feed database, [Animal Feed Analysis Web Application](#) (AFAWA), which compiles the nutritional composition of major dryland feeds.
- A baseline questionnaire to evaluate sheep management practices before and after the training program was developed and field-tested.

1. Introduction

Changes in sheep husbandry are not easy to achieve because they are usually strongly tied to traditions. However, there is a high potential to increase herd productivity through enhancing knowledge and capacity of sheep owners and by introducing easy-to-implement changes in sheep husbandry practices.

This project funded by the International Fund for Agricultural Development (IFAD) provided ICARDA the opportunity to actively convert scientific knowledge generated over many years into improved management practices and develop related extension materials for farmers. Usually this is a task left to more development oriented institutions, which has the disadvantage that only well documented results are being dispersed and that there are often no feedback loops between the researchers, the development agents and the farmers about practicability and impact of improved practices. Thus, this project provided a unique learning opportunity. Further investment in “knowledge compilation and sharing” projects that enforce such direct feedback could enhance the utilization of scientific results and the ability of researchers to provide full documentation of technologies required for easy conversion of scientific results into farmers’ practices. Additionally, this project put the material into a “practicability” test through the training workshop. This was useful and meant that the training workshop did not only serve as capacity development for farmers but rather as active knowledge sharing between scientists and farmers.

Compared to other projects that have produced training materials, this project is considered innovative because:

- the material will be specific and tailor-made for the situation of Syrian and Lebanese Awassi sheep farmers;
- the material will be introduced and tested through targeted training sessions; and
- the training and dissemination of the material will be organized as a farmer curriculum and synchronized with the seasonal management cycle.

The project planned to apply a two-phase approach for implementing the project activities in the two target countries – Syria and Lebanon. The majority of farmers’ training and on-farm demonstrations were supposed to take place in Syria. After the completion of the extension materials and the testing of the implementation arrangements in Syria, a reduced training program was scheduled for Lebanon.

After a promising start, it became clear in Spring 2012 that the conflict in Syria would not allow ICARDA to return to the original target sites in that country. The project was then relocated to Lebanon. Unlike the activities in Syria, ICARDA was not able to link the project to an existing development project in Lebanon. While this presented a shortcoming, the project was still able to produce key achievements and develop materials that can be used in future farmers’ trainings.

Awassi is the most important sheep breed in Mediterranean West Asia and is shared by Turkey, Syria, Lebanon, Jordan, Palestine and Iraq. In Lebanon and Syria it is the only sheep breed kept by farmers with a population of approximately 21.3 million sheep in these two countries alone.

The three main components of the project were:

- 1) Preparation of technical advisory material
- 2) Testing the material in training workshops with farming communities
- 3) Assessment of changes in livestock husbandry practices or improved knowledge related to best practices in livestock husbandry.

2. Preparation of technical advisory material

The list of extension material was finalized based on discussions with the collaborators during the project planning workshop and with farmers during the site visits in Syria. It was agreed that the series, entitled “*Best Practices for Managing Awassi Sheep*”, would include ten practical guides, i.e. five major management guides linked to physiological stages of the Awassi ewes and five supplementary guides providing additional knowledge and techniques. In response to the recommendation from several institutions and from meetings with farmers in Syria and Lebanon, a guide on “Lamb fattening”, which was considered a very important source of income, was added to the series later.

Six guides were printed until mid-2012 and were widely distributed by ICARDA to relevant stakeholders in Syria, including the International Fund for Agricultural Development (IFAD) investment projects, extension directorates of the Ministry of Agriculture, and universities. Positive feedback was received, including orders for additional copies. The distribution of the guides produced later was limited due to the conflict in Syria, therefore the full series of guides was shared with the Integrated Livestock Development Project, a new IFAD investment project, and with the Rural Support Program of Aga Khan Foundation to achieve a wide distribution among Syrian farmers integrated with livestock development. All guides were distributed to relevant stakeholders in Lebanon.

Table 1. List and type of extension guides

No.	Title of guide	Type	Distribution in Syria
1	Managing ewes and rams during Mating	major	widely distributed in Syria
2	Managing ewes during Gestation	major	widely distributed in Syria
3	Managing ewes at Lambing	major	widely distributed in Syria
4	Managing ewes during Lactation	major	distributed to ILDP and RSP
5	Milking and Milk Processing	major	widely distributed in Syria
6	Selecting ewes and rams for breeding	supplementary	distributed to ILDP and RSP
7	Health Care Guide	supplementary	distributed to ILDP and RSP
8	Feed Reference Guide	supplementary	distributed to ILDP and RSP
9	Preparing Urea-treated Straw	supplementary	widely distributed in Syria
10	Body Condition Scoring	supplementary	widely distributed in Syria
11	Lamb Fattening	supplementary	distributed to ILDP and RSP

3. Testing the material in training workshops with farming communities

3.1 Partnering with IFAD investment projects

The planned project approach was to develop and implement the training program and knowledge projects with partners from IFAD investment projects in Syria so that the intensive testing phase could be followed up by out-scaling through the partner investment projects.

A close and collaborative relationship with the IFAD investment projects in Syria evolved. During an inception workshop between IFAD and ICARDA, it was agreed that the identification of the target villages, detailed work plans and time schedules would be decided during visits of ICARDA to IFAD project sites and with direct consultation with the IFAD project staff and based on meetings with farmers.

ICARDA staff visited three IFAD investment sites with the aim of getting to know the staff, the activities, and the facilities of the IFAD investment projects, meeting with a representative group of farmers, and at discussing the involvement of the extension service. After the three site visits, it was agreed to collaborate with two rural development projects active in Syria at that time, the Idleb Rural Development Project (IRDP) and the North-Eastern Regional Rural Development Project (NERRDP). Joint work plans were developed.

In Idleb, two locations, Jabal Zawieh (Quaro village) and Jabal Wastani (Fleifel) differing in agroecological conditions and sheep management practices were selected by IRDP. NERRDP proposed one village each in Hassaka and Deir Ezzor (Al-Rshidieh and Miadin village, respectively) based on the importance of sheep production and the interest shown by farmers.

The activities with IRDP started with a baseline survey and two day-training workshops in the two villages in Idleb in April 2011. From beginning of May 2011 onwards the security situation in Syria did no longer allow the ICARDA team to travel to the selected project villages in Idleb, Deir Ezzor, and Hassaka and to continue direct engagement with partner projects.

3.2 Training program in Syria in 2011

The training series started with milk processing (guide no 5) with a two-day course in each village, i.e. two in Idleb, one in Hassaka and one in Deir Ezzor.

3.2.1 Training workshop in Quaro Village

In Quaro village women cannot work together with men, so the training had to be done separately for men and women. On 25 April 2011, 17 male farmers and two technicians from IRDP met with the male members of the ICARDA team. ICARDA presented improved methods of making cheese and yogurt to the participants, and explained the advantages of milk pasteurization and the most important factors to be considered for obtaining high quality milk products. At the same time, female trainers prepared yogurt and cheese together with six women (wives of the farmers). They produced different types of yogurt using local and commercial yogurt cultures, and local cheese using pasteurization. On the following day, the ICARDA team met again separately with ten women, and with male farmers and extension staff. The yogurt and cheese made by local and improved methods were examined and tested by farmers and women, and discussed.

The women were very interested in the new techniques, especially in milk pasteurisation, as this technique prevents the blowing of cheese which they perceived as a major problem. Both men and women were in favour of using commercial yogurt culture as it resulted in a mild flavour of the

yoghurt which would obtain a better price in the market. In this session the extension material was presented to the farmers, who understood the illustrations easily, and did not suggest any changes. All participants were highly interested in the course and asked the ICARDA staff to keep in contact.



Training workshops in Idleb

3.2.2 Training workshop in Fleifel Village

The training in Fleifel Village on 27-28 April 2011 followed the same schedule as in Quaro village. However, in Fleifel men and women did not need to be separated. Thus, both the theoretical and practical training involved both men and women; two technicians from IRDP, 19 female and six male farmers attended the training workshop. Improved methods of making cheese and yoghurt were introduced and then practiced by the ICARDA staff together with the women. The women asked many questions and explained their methods and experience. The testing of the different products on the following day revealed different opinions about product quality. As in Quaro, the farmers reviewed the extension material and had no difficulty in understanding the instructions.

3.2.3 Discussions with farmers in Kawikly Village

Due to the conflict in Syria, from May 2011 onwards Idleb, Deir Ezzor and Hassaka were no longer accessible to the ICARDA trainers. Therefore, Kawikly Village in the district of Munbej, Aleppo Province, was selected for the purpose of discussing the proposed management guide for the mating period with farmers on 14 September 2011. The meeting included 20 farmers and 2 extension officers.

The purpose and content of the series *“Best Practices for Managing Awassi sheep”* was explained in general. Then 20 copies of the draft booklet on sheep management during mating was distributed to the participants and explained in detail. The reasons for and expected benefits from the individual practices were thoroughly explained and discussed. A lively discussion aroused around the proposed practices. For example, one farmer remarked that some techniques are difficult to apply to small flocks. It was agreed that there are possibilities to adjust the techniques by working with farmers on practical solutions. The extension officers said that they found the guides easy to understand and that this type of material was needed.

The farmers also suggested that the topic *“Lamb fattening”* should be added to the series as this was a very important source of income in the area and requested a workshop/seminar in the village to cover this subject.

3.3 Training program in Lebanon

When it became clear that there was no chance to continue the project activities in Syria, ICARDA consulted with the IFAD project Hilly Areas Sustainable Agricultural Development Project (HASAD) in Lebanon to discuss a similar implementation arrangement as in Syria. However, there was no basis for such a collaboration as HASAD was not targeting sheep producers.

Instead it was decided to implement the project jointly with the Lebanese Agricultural Research Institute (LARI) to benefit from LARI's knowledge and technical expertise related to the local Awassi production systems.

The disadvantage of a missing link with a development project was that there was no permanent presence in the target villages to follow-up on the trainings and organize additional demonstrations. The partnership with an IFAD investment project as in Syria would have intensified the relation with the farmers and allowed us to reach a larger target group.

After the consultations with partners in Lebanon and a field visit to Bekaa Valley in June 2012, a project work plan was developed with LARI and a no cost extension for six months was requested from IFAD and granted.

Thirty farmers from 12 villages in the West of Bekaa Province were selected as target farmers for the full training program in Lebanon (Figure 1). The villages and number of farmers in each village included: Taria (2 farmers), Sahel Al-Bawadi (3 farmers), Kaferdan (8 farmers), Baalbak (5 farmers), Housh Barda (4 farmers), Mazrat al tout, Adouss, Majdaloun, Housh Al Zahab, Tel Al-Gerbal, Housh Tel Safieh and Samshtar (1 farmer in each village). After conducting the baseline survey, the farmers were invited to the first training in September 2012.

The trainings were implemented as planned with the exception that the trainings on sheep health care (planned for October 2012) and on managing ewes during gestation (planned for November 2012) were combined and conducted on 2 October, 2012. The training on sheep health care created a lot of interest and time in the combined training proved to be too short. Since it was not combined with another topic, the training was repeated. After the trainings the farmers received the extension booklets, 11% of them were unable to read but still asked for the booklets.

Table 2. Farmers' training in Lebanon from Sept. 2012 to May 2013 and attendance by target farmers

Training Topic	Date	Male	Female	Attendance of Target Farmers (%)
Managing flock during mating	3 Sept. 2012	7	5	15
Sheep health care/ Managing ewes during gestation	2 Oct. 2012	50	10	81
Managing ewes during lambing time	13 Nov. 2012	34	0	70
Managing Ewes during lactation	15 Jan. 2013	22	4	74
Feed and Feeding	5 Feb. 2013	19	5	56
Sheep selection	5 March 2013	20	0	44
Milk processing course	19-22 March 2013	0	14	19
Sheep health care	7 May 2013	36	10	37

An additional intensive course on sheep management was given to 28 extension workers from the Baalbek El-Hermil Agriculture Department (MoA) active in North of Bekaa Valley, 19-20 December 2012.

It proved to be difficult to ensure the continuous attendance of the thirty target farmers in the training series. Especially in the first training, the comparison of the names of the participants with the originally invited survey farmers showed that many farmers did not come personally, but sent a neighbour or relative. The situation improved in the next trainings as a result of a better understanding of the project's objectives by the farmers and an improved approach from ICARDA. Trainers sent invitation letters to the farmers detailing the program and they were reminded by telephone one day before the training. Additionally, the dates for the next training were agreed during the training. However, it has to be acknowledged that farmers often have to deal with short-notice commitments related to their herds or other farm activities which prevent them from attending trainings. For example, three of the originally selected target farmers were unable to attend any training because they had to look after their sheep full time.

4. Impact Assessment

Because the focus of the project was on improved sheep management practices, ICARDA planned to measure outcome as changes in farmers' behaviour and practices.

4.1 Baseline Survey in Syria

The original plan was to assess the project outcome in Syria after intensive training of pilot farmers over one full production cycle by ICARDA and its IFAD project partners and another year of follow-up mainly by the project partners.

The questionnaire for the baseline study was finalized in mid-March 2011. The survey was first initiated in Idleb. In cooperation with IRDP staff, locations and farmers were selected. On 23-24 March 2011, four IRDP technicians were trained in interviewing the farmers. Each question was fully explained, and then the questionnaire was jointly tested in two villages. At the two sites in Idleb, interviews in March/April 2011 were conducted with farmers in the target and in a neighbouring (control) village: for Jabal Wastani in Quarro (12) and in Biates village (control, 11) and for Jabal Al-Zawieh in Fleifel (11) and in Kafer Mous village (control, 9).

The data was not analyzed because the training program in Idleb had to be abandoned.

4.2 Baseline Survey in Lebanon

The baseline questionnaire for the project locations in Lebanon was adapted to Lebanese conditions with the help of the Lebanese Agriculture Research Institute and based on information collected during a field visit in June 2012. The survey was conducted from 1-9 August 2012 in the West of Bekaa Province. Thirty farmers from 12 villages were interviewed (see figure 1). Beginning of April 2014 the survey was repeated with 27 farmers (three could not be reached) to evaluate if farmers had changed some of their practices. They were also asked for feedback on the trainings.

The results of the survey did not show any clear differences between management practices before and after the workshops. This result was not entirely unexpected because:

- the time to see changes in certain practices was too short. For example, the training on selecting breeding animals was done in March 2013 but farmers would not have the opportunity to apply their new knowledge until May or June 2013; and
- the thirty target farmers had not attended the full training series (the percentage of the target farmers attending a session ranged from 15 to 81% in the eight training sessions, see p. 12).

However, the questionnaire has been field-tested in Syria and Lebanon and can be applied for similar purposes by other partners. The surveys also helped to understand the differences in the production conditions between Syria and Lebanon which was useful for adjusting some details in the training program, e.g. available feed resources for formulating diets.

The survey also included an evaluation of the training workshops. The farmers' responses related to the trainings were positive:

- 63% of farmers said they gained new knowledge from attending the workshops;
- 57% of farmers reported that they changed some of their practices related to sheep management after attending the workshops, for example vaccination and feeding;
- 78% of farmers wished to attend more workshops;
- 91% of farmers reported that the booklets are a good source of information, and that they will keep them as reference; and
- none of the farmers had any suggestion for further improving the booklets contents.

These results confirm that the project achieved its outcome related to making new knowledge and skills available to farmers as the majority of farmers gained new knowledge, were willing to implement some of the new practices and would be interested in further training.

5. Project Assessment

5.1 Achieving the three project components

The project was effective in achieving the first two specific project objectives. Specifically, the project captured scientific and local knowledge in technical bulletins in an easily accessible format in Arabic and published the material as a farmer's curriculum, focusing on the farmers' reality and management calendar.

Five guides along the Awassi sheep management calendar and six supplementary guides were prepared and made available as hard and soft copies in Arabic. English translations will soon be made available online. In addition, a web database compiling the nutritional composition of feeds analyzed at ICARDA during the last ten years is accessible online as a help for scientists and extension agents to formulate sheep diets.

The project also managed to cope with the problems caused by the situation in Syria by shifting the implementation of the training program to Lebanon through an excellent collaboration with the Lebanese Agricultural Research Institute. The training program in Lebanon following the full production cycle allowed ICARDA to test and discuss the material with farmers and extension workers in order to meet the third specific objective. It has provided interesting lessons learned on design and conduction of such trainings.

Accomplishing the third project component proved difficult. ICARDA was not able to show clear changes in farmers' management practices related to the training course on best practices through the survey. The project duration in Lebanon was too short and the interactions with the farmers were limited to the training sessions because there was no IFAD development project active in the target villages to follow-up on the proposed improved practices.

5.2 Assessment of impact and replication

The main goal of the project, to provide extension material evaluated by farmers that can be easily used by development oriented projects, was fully achieved. The materials developed for this project are expected to be used by future development projects targeting Awassi sheep farmers, like the Integrated Livestock Development Project (ILDLP), and a new IFAD livestock investment program in Syria. Development project have the opportunity and means to reach out to a larger numbers of farmers than ICARDA was during this project.

There are inherent differences between Syrian and Lebanese Awassi sheep production. For example, sheep keeping is not as widespread in Syria as in Lebanon. As a result, Lebanese farmers are more specialized and keep larger, better organized herds. Rangelands are also not as degraded and contribute more to the diets.

The series, available online in English and Arabic, can be also used as templates for producing similar material for other sheep breeds or ruminant species.

6. Lessons Learned

6.1 Lessons for IFAD

The original concept of embedding the development of the farmers' training courses and the extension material into IFAD development projects was effective. From the short experience in Syria, one can deduce that a direct link between the technical support and farmers' components of the IFAD investment projects in the targeted areas would have helped to promote the improved husbandry and processing practices through practical demonstrations and enhancing the skills of farmers and extension workers. This link would have also guaranteed a longer term, more intensive involvement with the target farmers

When the collaboration was initiated at the target sites in Syria, it became apparent that there was a huge demand from the IFAD investment projects for technical backstopping and experimentation for their livestock related activities, e.g. ration formulation for feed block enterprises, establishment of dairy processing plants, other joint trainings, etc. This reflects the fact that investment projects could greatly benefit from knowledge generation and sharing arrangements with international, regional or national research organizations depending on the technical know-how and capacity required.

It would have been best to combine the series of theoretical and practical trainings and related guides with practical demonstrations in the villages so that the farmers and their wives would have the opportunity to test the practices themselves with sufficient technical backstopping.

6.2 Lessons learned from the training workshops with farmers

After the first training with the farmers in Syria it became clear that they could not actively review the content (text and pictures) of the guides as initially hoped. However, the farmers were able to review the applicability of the proposed practices in the discussions, which was equally useful.

The same farmers should attend all or most of the trainings; this is a precondition for being able to evaluate changes in their management practices after the training. However, ensuring continuous participation of the target farmers over a full year proved to be a challenge. The thirty target farmers in Lebanon did not manage to attend all trainings and instead often sent a neighbor or a relative, especially at the beginning before they fully understood the project's objectives.

The involvement of extension officers in the trainings was considered important for obtaining wider and more continuous benefits from the training series. However, it was difficult to gather farmers and extension officers at the same time. As a result, a separate intensive training for extension workers was conducted in Lebanon in agreement with the Ministry of Agriculture. A special training series targeting extension workers should be planned along with farmers' trainings.

Some farmers attended the first trainings with the expectation of obtaining benefits or support from the projects, such as feed subsidies. Such issues should be immediately clarified to avoid confusion. Thirty participants for intensive trainings proved to be a manageable number. To avoid a crowd in the trainings in the villages and ensure participation, specific invitations should be sent to the target farmers. The training on sheep health care created a lot of interest and is important. It should not have been combined with another topic; therefore, the training was repeated. Moreover, topics directly related to economic gains and losses created the highest interest, e.g. health care preventing morbidity and mortality.

The best way of engaging farmers in the topics and having their full attention was by arranging the theoretical sessions as a discussion of their experience and then adding and explaining suggested

changes in their usual practices.

The timing of the trainings is very important to catch the sheep at the right physiological stage for the practical session. For example, the training on lambing was held early to avoid difficult weather conditions later in winter; however, none of the ewes on the farm had lambed or was near lambing.

7. Conclusions

This project provided the unique opportunity for ICARDA to actively convert scientific knowledge generated over many years into improved management practices and develop related extension materials for farmers. The resulting workshops not only served as capacity development for farmers, but also as a method of active knowledge sharing between the scientists.

The crisis in Syria resulted in the relocation of the project to Lebanon, which made the demonstration of a change in management practices too ambitious for the allotted timeframe. However, the feedback from the farmers was positive.

This project also resulted in the production of a training series entitled “*Best Practices for Managing Awassi Sheep*” in both Arabic and English, consisting of eleven field guides, which are available online. Feedback and demand for additional copies of the guides was high. The guides were shared with various partners and stakeholders in Syria and Lebanon. Additionally, the templates of these guides can be used to adapt the material to other countries and for other ruminant species.

About ICARDA and the CGIAR



Established in 1977, ICARDA is one of the 15 centers supported by the CGIAR. ICARDA's mission is to improve the livelihoods of the resource-poor in dry areas through research and partnerships dedicated to achieving sustainable increases in agricultural productivity and income, while ensuring efficient and more equitable use and conservation of natural resources.

ICARDA has a global mandate for the improvement of barley, lentil and faba bean, and serves the non-tropical dry areas for the improvement of on-farm water use efficiency, rangeland and small ruminant production. In Central Asia, West Asia, South Asia, and North Africa regions, ICARDA contributes to the improvement of bread and durum wheats, kabuli chickpea, pasture and forage legumes, and associated farming systems. It also works on improved land management, diversification of production systems, and value-added crop and livestock products. Social, economic and policy research is an integral component of ICARDA's research to better target poverty and to enhance the uptake and maximize impact of research outputs.



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