

My thoughts during the first training activities since 28 years ago

Between February and October in 1988, I taught practices of the country-focused group training course on vegetable seed production for the Philippines held at the Tsukuba International Agricultural Training Center, JICA (TIATC). Last year after 28 years, I had a chance



Participants photographing grafting with mobile phones

to teach the same course. What I thought changed from before was that all the participants had mobile devices and were taking photos during practices. Previously, I couldn't imagine that they were communicating via

video calls with family in their home countries. I guess this frees them from being homesick. But for an old mind, it felt that it may have a negative influence on their spirit to learn technologies in a faraway country, for their own country. What I also felt was that there was an increasing attitude of taking this overseas assistance for granted. I felt this way because when we were preparing materials for individual experiment, there were demands for items that are difficult to obtain or install and requests for study trips in Japan.



Visiting broccoli farm during the study tour

My stance as a training instructor is that we nurture their own thinking desire to learn, and this has not changed much for the last 28 years. We learn together, and sometimes we scold or encourage participants through a pep talk. Ultimately, if we can establish a trusting relationship during the course by providing them guidance and their acquiring technologies, there is nothing more to hope for.

I taught at the Koibuchi College of Agriculture and Nutrition for 24 years. The school's crop and horticultural experiments and practices, as well as dissertations were equivalent of shared experimentation, practices and individual experiment of the vegetable training courses. Although our participants are more



Practice on water melon grafting



Seed potato planting during a common experiment

adult than students, their attitudes and temperament towards learning and importance of motivation are very similar to those of students. In addition, the way they tend to be "big headed" in learning techniques is also very similar.

The 4-year education at Koibuchi College is a bit like teaching baseball. In the beginning, we build up legs and abdominal strength (i.e. work sense – ability) by training in running (farm work) without showing clear purpose, and we teach them forms (cultivation technologies). I have taught students using medicines as an example that volume can change quality and that different scales of cultivation operations change appropriate cultivation technologies. I also taught that by repeating the same work many times, one can acquire technologies and the real meaning of particular technologies. However, in this training course we are rather limited in terms of plot size and the time we have, and it is difficult to implement a curriculum such as I used at Koibuchi College. Participants are not real farmers and therefore there is no need for such a curriculum either. This is a little bit frustrating sometimes. Still I try not to bother about it because this can also be said for Japanese students. We may be interested in acquiring ideal forms, but in reality, one really needs to train legs and body in order to realize the ideal forms.



Practice on carrot threshing



Practice on compost making

When I started working at Koibuchi College moving from TIATC 28 years ago, I remember I wrote the following rather audacious first greeting as a new member of staff. "People working in agriculture are putting excessive importance to experience. If one is an experience supremacist, he or she tends to try to guard their territories and does not accept newcomers' ideas. Theory is born with experience as a mother. At the same time, if experience is not nurtured by theory as a father, experience alone can lead to wrong conclusions." After that, in addition to lectures in classrooms, I experienced crop cultivation for many years having belonged to the Practice Division of Agriculture. As a result, maybe also due to my age, I came to think that agriculture is such a deep and complicated profession, one simply cannot explain everything in theory. I might have been audacious when I was younger, but I think it was after all not bad. I hope that participants will be able to utilize the theories they learn in Tsukuba after they return to their home countries.

(By Oikawa, January 2017)

Improvement of vegetable cultivation course: AAI's effort to link abroad experience and training in Japan <Part 6>

Last part – Epilogue

The Tsukuba International Center's vegetable cultivation training course has a long history. And the AAI has been involved in the training for over 10 years including the running of country-focused group training courses. In recent years in particular, emphasis has been placed on small scale farmers and their livelihood improvement, as well as marketing. Another important theme has been capacity development of extension workers in order for them to effectively transfer technologies and information to farmers. This is also related to the fact that extension, training and marketing are seen as key in the international cooperation field.

In this climate, we have introduced in this series our training activities from the view point of applying our experience in developing countries to the training work in Japan, and also applying experience in the training work to our field-based work in developing countries. In this final part of the series, we would like to look back at the case studies introduced in the last four parts and examine various issues based on some points of view.

Strengthening extension capacity

Most of the participants who attend the vegetable cultivation technology training courses have experience in extension activities in one way or another. It is important for them to have a perception that training contents can be applied in their work after returning to their countries. To ensure this happens, our objective across the training courses is to improve participants' ability to think and make decisions. This is in particular done through introduction of concrete examples of extension projects, development of manuals for supporting implementation of extension activities, and teaching of data utilization methods. In addition, in order to ensure that participants themselves can use the new skills without aid and to make our training courses

as practical as possible, we have various special considerations and innovations as shown below.

View point of practical training

In our training courses, we put particular emphasis on practices with manual activities. For example, we task participants to analyze agricultural statistics, data and calculate crop water requirement, and we ask them to write down their opinions and ideas on cards and organize group discussions based on those. In addition, during the outdoor irrigation practices, participants touch soil samples and feel the differences of soil characteristics, and they measure irrigation water flow. Moreover, introduction of and experience in an information gathering method using five senses is also a unique aspect of our training courses.

Participants' activities after returning to home countries

After training, participants go back to their respective work in their home countries. At work, they will implement the action plan formulated at the end of training courses, but they sometimes face a variety of obstacles. For example, situations in their countries may be very different from those in Japan. There may be insufficient financial resources, materials and human resources. They may not be able to gain understanding and support from their bosses for their action plan implementation.

To deal with these problems and to implement action plans, in addition to technical skills, problem solving skills are required. Participants acquire these skills through their on-the-job experience. However, in addition to experience, it is probably necessary to have opportunities for training to improve their skills.

The following table summarize the overview of lectures and practices, targets and relation with participants post-training activities discussed in this series.

Lecture and practice items	Overview of lectures and practices	Objectives and targets of training and links with participants' post-training actions
Local application and extension of useful technologies	Confirm and share abilities necessary for extension workers through CUDBAS*. Information collection method using five senses and body. Methods for developing extension manuals etc.	Improvement in participants' ability to think and make decisions. Deepen knowledge on farmer guidance appropriate for local context and on methods for developing of manuals and apply in actual extension work in countries.
Crop production and irrigation technologies	Lectures and practices on irrigation technologies that are essential for crop production increase. Exercise to estimate irrigation schedules, crop water requirement and water flow volume in irrigation channels.	Increase understanding on basic ideas on water requirement of different crops and watering timing that are necessary for irrigation planning and management. Increase foundational understanding on irrigation and ability to apply these in extension activities.
Data collection and application methods for extension	Lectures and practices on basic data utilization methods for extension, farming household survey methods for data collection, and creating questionnaires.	Understand regional characteristics through analysis of existing and newly collected data. Learn farming household survey methods and concrete examples of extension activities and link the understanding with increased effectiveness in extension activities.
Marketing method	Lectures and practices to introduce an overview of technical assistance project examples related to marketing, group work to classify and analyze using the 4P marketing tool.	Nurture ability to practice and apply knowledge through analysis of classification results using participants' own experience and knowledge, making proposals and suggestions for technical assistance project activities. Acquire ability to use practical sense on marketing and to apply it in future activities.

*: CUDBAS means a Method of Curriculum Development Based on Vocational Ability Structure

Market-oriented agriculture in Palestine <Part 6>

Future development

In this series over the last five parts, we introduced demonstration activities of various candidate technologies that are considered effective for further promotion of market-oriented agriculture in Palestine. In this last part of the series, we put together the table below after considering lessons from our activities and suggestions for future development.

For candidate technology introduction impact, we provided farmers who indicated interest in evaluating the difference in profitability with or without technology introduction of some materials and machinery from our project. They received technical advice from the project, and they took records and compared profits with or without technology. To facilitate their work, we developed a special notebook for farming records that can be easily filled in by farmers and conducted training

sessions on how to use the notebook. This farming notebook enables farmers to compare profit margins among different crops and those differences in various cycles of the same crop. Many farmers perceived this notebook as an extremely effective tool to consider farming plans based on crop budgets.

Based on the experience gained through the technical verification activities conducted during the project, posters and brochures were developed to showcase the usefulness of individual technologies and a manual for different technologies was put together to guide future extension activities. From now on, the Ministry of Agriculture of Palestine plans to utilize this technical manual and extends their work to areas outside of the project target areas. We sincerely hope that the individual technologies will be used appropriately by farmers and that this will lead to an improvement of local people's livelihoods.

Introduced technology	Lessons from activities	Possible future development
Diagnosis of irrigation facility	Education for farmers covering "soft" areas such as appropriate amount and frequency of irrigation is extremely important in the long run, because use of tensiometers and improvement in irrigation network does lead to water saving and production increase. Therefore, we paid special attention to strengthen extension workers' ability to diagnose irrigation facilities so that they can provide effective advice to farmers to improve "soft" elements of irrigation.	Extension workers who participated in various activities are improving their technologies and knowledge through applying what they learned in practice. Irrigation facility diagnosis itself does not cost very much. Thanks to awareness raising on the usefulness of irrigation facility diagnosis services using various opportunities, the number of farmers requesting the diagnosis services is increasing. In future, it is hoped that farmers addressing recommendations from diagnosis will lead to improvement in their profitability.
Grafted seedlings	Success of grafting cultivation significantly depends on the quality of grafted seedlings. Hence seedling companies and farmer groups that produce grafted seedlings must be able to establish the trust with farmers, by ensuring avoidance of contamination of different varieties, prevention of pest and disease infection and timely shipping to facilitate planting in the right season. It is also important for farmers not to entirely leave quality maintenance and management of grafted seedlings to producers. It is also important for farmers to be able to watch the quality of grafted seedlings.	Prior to grafting cultivation, it is desirable to fully explain to farmers the difference between grafting cultivation and conventional cultivation, so that farmers can start planting seedlings with a good understanding of the pros and cons of grafting cultivation. In addition, further improvement in cultivation management technologies and examination on the profitability are required for grafting cultivation with tomato, cucumber and water melon.
Compost	As for production and use of compost, users of compost produced at individual compost production centers provided basically positive evaluations. However, use of compost is still limited. Some of the reasons for the low uptake rate are insufficient knowledge about ideal application amounts and suboptimal understanding of the roles of compost by farmers. Many farmers consider compost as an alternative to chemical fertilizer and expect compost input to increase yields.	Although compost has fertilizing effects, it should be basically used for soil improvement to increase soil fertility through repeated application. In future, through training and demonstration, compost's features need to be explained to farmers in an easily understandable manner so that compost is applied in accordance to its properties.
Silage	Given that there are many cases where machinery provided by donors is being left unused, this project promoted shared use of production machinery through a rental system. Through this, we tried to establish a sustainable system for machinery maintenance and management. However, given that there were organizations that continued to provide free machinery, it was felt necessary to coordinate approach between activities of donors and NGOs.	Introduction of machinery led to increased production of silage by farmers. However, methods for feeding with silage varied between different farmers. In some cases, inappropriate feeding had negative impacts on animals. Silage use experiment was limited to a very simple experiment to compare silage use and hay use. In future, more detailed experiments should be conducted to analyze the nutritional difference between various types of fodder at an experiment and research center. Based on the results, it is hoped that more appropriate guidance to farmers can be provided.

Onion drying project in arid regions - Joint work between AAI and the drying machine maker Taikisangyo Co., Ltd- <Part 2>

Machinery introduction and dry onion production

The feasibility study originated from our collaboration with the National Organization for Technology Assimilation (NOTA) and started with placement of machinery in Kassala in March 2016. The machinery that arrived in Port Sudan was transferred overland to Kassala and brought to, and installed, in the existing building within the Horticulture Department plot of the State Ministry of Agriculture in Kassala which is a project counterpart organization. Machinery that is necessary for the study such as electric dryers, slicers, and crushers was procured from Taikisangyo Co., Ltd which is the leading institution for this feasibility study.



A building with drying machine and installed machinery

This field work aimed to confirm adaptability of introduced machinery in the local environment and to transfer the knowhow of machinery operation methods to NOTA staff. Two NOTA staff participated in the field work throughout the period and one head of administration played a coordination role including procurement of materials, NOTA internal communication, sales, negotiation and liaison with the State Ministry of Agriculture. In addition, government staff including women, experimental plot technicians and young staff of NOTA also participated in the activities.

The main onion variety in Kassala colors red called Baftem Red. It is a variety which is relatively suitable for processing into dried onions. It is cultivated using water basin irrigation, with seeding in August, transplanting in September and the harvest season is concentrated during the period from January to March. This means during the harvest season, the market price of onions goes down sharply, resulting in some farmers abandoning onions on their farms and affecting farmer incomes in a major way. Therefore, dried onion processing can utilize excess onions effectively, stabilize market prices and contribute to income increase among local residents, in particular smallholders.

With local staff we conducted experimental operations

for about two months in the field. During the period, the best drying methods were explored, changing the amount of onions to put into the machine at a time, thickness of slices, drying temperature and different ways of hot air circulation. At the same time, we checked production costs including labor, electricity and water bills and packaging. A result was that with the introduced drying machine, it was possible to dry more than 120 kg of sliced onions at a time. At the drying temperature of 70 °C, it took around 10 hours to finish drying circulating the air. It was revealed that if washing of onions, slicing and drying are done efficiently, it was possible to do a maximum of 1.5 times the production cycle per day. Moreover, it is possible to achieve further efficiency in operation by sun-drying onions in the beginning of the drying operation.



Onions before drying (left) and after drying (right)

Produced dried onions are packed by NOTA in original packaging and they plan to sell it in Kassala and Khartoum. Also, after the departure of Japanese experts, NOTA has been continuing drying experiments using eight other crops including tomato, molokheiya and mango.



With this survey we confirmed that the introduced machinery such as the electric dryer was operational without problems. We also confirmed that operation and cleaning of the machine was carried out by local staff. In future, more machinery will be introduced. The next step is to verify how economic efficiency can be increased while maintaining dried onion production and its supply chain, ensuring efficiency of operation and management.

In future, more Japanese dryers will be deployed. Production of dried onions can be expanded, in addition to Kassala, along the River Nile which is the largest onion producing region, and markets can be further developed in Sudan and beyond the borders. It is important to continue support aiming to contribute to increase the income of onion producing farmers and organizations.