Are Japan's cultivation techniques and the wisdom of creative Japanese farmers applicable?
– Case study of training activities at Tsukuba International Center -

Part 6: Conclusion

In this series, we discussed four case studies introducing Japanese cultivation techniques that exhibited a high application potential in developing countries, in vegetable cultivation training courses at JICA Tsukuba. Trainees experienced and evaluated different techniques at first hand as part of individual experiments, in order to solve problems they face in their countries in vegetable cultivation through applying Japanese cultivation techniques. The following table summarizes the contents of the experiments.

Trainees Country	Problems	Possible techniques	Challenges for application
Philippines	Soil borne diseases affecting tomato cultivation	Grafting technique	Impact of grafting on yield and quality of crops. Training on grafting and naturalization techniques. Economic consideration. Secure supply of high quality stock plants.
Nicaragua	Insufficient availability of quality seed potatoes	Systematic production of seed potatoes and distribution system	Establishment of quality management system of imported potatoes. Testing methods to evaluate appropriate size of seed potatoes. Introduction of extension techniques using model plots.
Samoa	Low yield from free growing cultivation of tomatoes	Pruning and vine training techniques	Labor and costs required for pruning and vine training. Development of training methods for determinant variety of tomatoes
Mongolia	Control of difficult and persistent pests	Application of selective pesticides and rotational use of pesticides	Organized research on integrated pest management and introduction of extension techniques using model plots.

In addition to the above, the training courses introduced other techniques to tackle a variety of problems in other trainees' countries. These included use of *neridoko* (soil mixed with compost and water) nursery beds to deal with low rooting problems in tomato seedlings when planting in drylands in Ethiopia, organic fertilizer production from fermentation of chicken droppings to counter animal waste problems in Kenya, and mulching (silver mulch) to control pest problems in organic farms in Nicaragua. Although the trainees had some knowledge of these techniques, they had had little experience in applying them in their work. In the training courses, we first ensured that the trainees mastered the basic vegetable cultivation techniques. Then they learned application of the techniques from the experiences and wisdom of creative Japanese farmers. Based on the newly acquired knowledge, trainees evaluated and examined the applicability of each technique to their countries' natural and agricultural environment. Naturally, there were a number of challenges that are expected in the process of local application.

Some techniques such as grafting, pruning and training, *neridoko* nursery beds and fermentation of chicken droppings, do not really require any special materials or equipment, therefore they are relatively easy to apply in developing countries. On the other hand, techniques such as use of selective pesticides and silver mulching require materials. Some measures even require establishment of a new system, for instance the case of setting up of production system for seed potatoes, which makes it harder to apply in other locales. A common challenge in applying Japan's cultivation techniques in developing countries is the need for re-evaluating the techniques in local environmental conditions and local circumstances surrounding the agricultural scene. One way to overcome this challenge can be found in the technique extension work which used to be seen in Japan. In this extension system, researchers from national or prefectural governments played an active role in introducing cultivation techniques to farmers. Farmers also communicated their own ideas and innovations that were generated in their daily farming activities. This led to the development of new techniques, and by collaborating with extension workers, technique development and extension work were run in a complementary manner.

The expectation of the JICA training courses is for the trainees, who learned Japan's cultivation techniques, to establish applicable techniques in their countries based on acquired knowledge, and to ensure their extension. Considering this, there should be adequate follow-up support to assist the trainees in examining the necessary plans and modifications for successful application in their countries of the techniques acquired in individual experiments. However, without sufficient follow-up, one cannot see the real results of the trainees' activities after returning to their home countries, making it difficult to gauge the impacts of the training. In order to resolve this issue, it is necessary to couple training with follow-up activities. Moreover, as mentioned in previous volumes of AAI News, another possibility is to strengthen the linkage between the training and other JICA schemes such as technical cooperation projects.

There are many cultivation techniques and wisdom accrued by creative Japanese farmers, which use the resources around us effectively, and many of them can be applicable in developing countries. Our company has experience both in implementation of technical training courses in Japan and in various activities in trainees' home countries. Making the full use of our experiences, we would like to continue to provide technical cooperation which is truly useful for the trainees. They have a lot of challenges to overcome in their countries.