



Local Acceptability on Organic Farming in Kampong Cham Province, Cambodia

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Abstract Recently, in Kampong Cham Province of Cambodia, subsistence agriculture is being converted to commercial mono-culture, and the amounts of agricultural chemicals applied to farmlands are increasing every year. There seem to be many cases in which people apply agricultural chemicals without understanding the impact on health and food safety. It is necessary to promote and enhance understanding of sustainable agriculture among local people including farmers. So, this study dealt with the evaluation of local farmers' acceptability on organic agriculture based on the participatory level. The extension activities, such as promoting sustainable agriculture through demonstrating how to make compost box and compost, leader training for their deeper perception on sustainable agriculture, and conducting workshops on sustainable agriculture through composting, were implemented in 2007. In the initial stage of the extension activities, farmers' participation was evaluated as Level 3, participation by consultation, as the farmers participated by answering the questions. Also in 2008, following activities were implemented; introducing the farmers how to make pellet compost, initiating 4 model organic farms, leader training on making bio-pesticide and conducting workshops on sustainable agriculture through applying pellet compost. In addition to the extension activities, the surveys by interview and questionnaire for evaluating local farmers' acceptability on organic agriculture were implemented occasionally. Through a series of the extension activities, the farmers' participation was evaluated as Level 5, functional participation, as the farmers participated by forming the groups to meet the predetermined objectives of the extension project. According to the results of evaluating local farmers' acceptability on organic agriculture based on the participatory level, it was considered that building local farmers' confident through various extension activities is the most important key to increase local acceptability.

Keywords organic farming, acceptability, local farmers, extension, Cambodia

INTRODUCTION

Kampong Cham province, one of the 24 provinces and town of Cambodia, is located in the central region of Cambodia and gets effect from Mekong River basin. The main activity of the people in this area is agriculture, mainly cultivating rice and vegetable, and raising animals. Agricultural activities of the area tend to change from subsistence to commercial mono-culture, and the amounts

of agricultural chemicals applied to farmlands are increasing every year. The applied chemicals in farmlands cause serious environmental problems in downstream, such as eutrophication, unusual growth of aquatic plants, decrease in dissolved oxygen and accumulation of bottom sediments in the water resources (Mihara and Fujimoto, 2000). Also, there seem to be many cases in which people apply agricultural chemicals without understanding the impact on health and food safety. According to Ngo (2009) more than 60% of farmers in Prey Chhor district, Kampong Cham province, had applied agricultural chemicals without understanding the impact.

In order to contribute to solving the problems, understanding of sustainable agriculture, namely organic agricultural practices were promoted and enhanced among local people including farmers. So, the objective of this study was to discuss and evaluate the local farmers' acceptability on organic agriculture based on the participatory level.

STUDY SITE AND METHODS

The study was conducted in Wat Chas village, Baray commune, Prey Chhor district in Kampong Cham province around 105 kilometers from Phnom Penh city (Fig. 1). In Wat Chas village, the farmers mainly grow rice and short-term vegetable crops. The big amounts of chemical fertilizers and pesticides have been applied in their farmlands through all cultivating seasons. The impact of such applied chemical substances on soil fertilities, farmers' health and environment tend to be severer, but the farmers did not understand these problems.

The study was constituted with the extension activities, such as holding workshops with brochure distribution, questionnaire survey, making demonstration models and making field study tour for the farmers. In 2007, the participatory learning workshops were held in the village with 24 main farmers. The main contents of the workshops included i) the introduction to organic and sustainable agriculture practices, ii) the explanation of the principle of composting and iii) the demonstration of making compost box and compost. The farmers were divided into 10 groups, and a concrete compost box was set up to each group constituted with 2-3 members for making their compost. Further guidance explanations and monitoring were conducted regularly in the process of the extension activities. At later stage of 2008, following activities were implemented, i) the workshop on introducing the farmers to make pellet compost, ii) the establishment of 4 model organic farms and iii) the leader training on making bio-pesticide and appropriate way of its application in the model farms.

A questionnaire survey for evaluation was conducted with 79 farmers (80% of the village households) in March 2009. The main questions of the survey were focused on i) their accepted perception on organic farming practices, ii) how change in the amount of chemical fertilizer and pesticide that farmers have applied, and iii) how difference in farming practices before and after the extension activities. Also, some questions concerning the level of the farmers' participation in the organic farming practices were included in the questionnaire sheet.

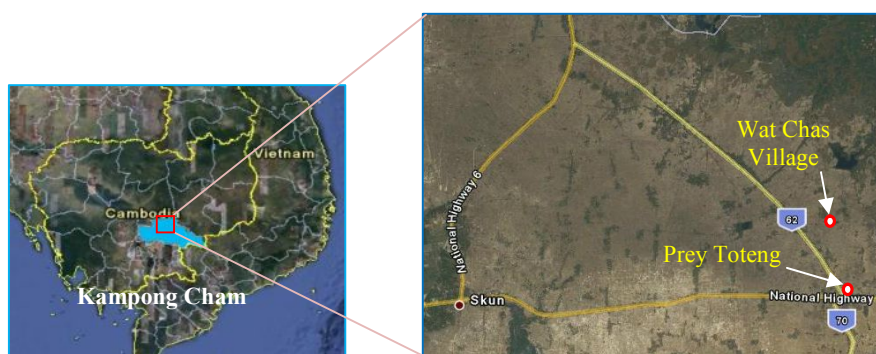


Fig. 1 Location of Wat Chas village in Kampong Cham province

The ways of farmers' participation were evaluated on the basis of the field observation, the content of discussion and the questionnaire survey. The conclusion of the level or degree of their participation was drawn on the basis of the participatory level developed by Pretty (1995) cited in Mihara and Yamaji (2004), which there are seven types of people participation, Manipulative Participation, Passive Participation, Participation by Consultation, Participation for Material Incentives, Functional Participation, Interactive Participation and Self-Mobilization (Table 1).

Table 1 A typology of participation

Typology	Characteristics of each type
1. Manipulative Participation	Participation is simply a pretence, with 'people's' representatives on official boards but who are unelected and have no power.
2. Passive Participation	People participate by being told what has been decided or has already happened. It involves unilateral announcements by an administration or project management without any listening to people's responses.
3. Participation by Consultation	People participate by being consulted or by answering questions. External agents define problems and information gathering processes, and so control analysis.
4. Participation for Material Incentives	People participate by contributing resources. They may provide the fields and labor, but are involved in neither experimentation nor the process of learning.
5. Functional Participation	Participation seen by external agencies as a means to achieve project goals, especially reduced costs. People may participate by forming groups to meet predetermined objectives related to the project.
6. Interactive Participation	People participate in joint analysis, development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals.
7. Self-Mobilization	People participate by taking initiatives independently of external institutions to change systems.

Source: Pretty (1995) cited in Mihara and Yamaji (2004)

RESULTS AND DISCUSSION

Local farmers' acceptability on compost and pellet compost making

A workshop on how to make compost box, and a few other workshops on making compost and composting were conducted for the villagers in 2007 (Fig. 2). The contents of how to build the compost box, making compost using local materials, compost application and its benefits were explained and demonstrated in these workshops.

Around 25 to 40 farmers participated in each workshop. All participants have found the workshops very important and most of them have understood well about the meaning of the workshops, and responded that they want to participate in next workshops, too. According to the results of the questionnaire survey, 95.6% of the farmers who had participated in the workshops on composting took the compost technology into practices and applied it in their farmlands, and have seen how effective the compost is to their growing crops (Fig. 5). However, among the 4.4% of the participants who did not practice making compost after the workshops, some responded in reason that they cannot afford to make the compost boxes, and the others said to be busy with other works. Also, this survey results showed that around 3 or 4% of other villagers who did not participate in the workshops has learned and made compost and applied it in their farmlands to increase soil fertility. This indicated that the knowledge learned in the workshops has been transferred to other villagers who could not participate directly in the extension workshops. Applying compost, the farmers in Wat Chas village reduced the amount of applied chemical fertilizers around 54% from

135 kg to 62 kg per year (Fig. 6) and can save some money as the materials for making compost are available in or near the village without any charge.



Fig. 2 Farmers attending workshop of composting



Fig. 3 Workshop on pellet compost making with farmers

The workshop of transferring the pellet compost technology was conducted in 2008. Pellet compost has higher resistant from washing out by surface runoff. More nutrients can be supplied to crops and kept in soils for long term comparing to conventional compost (Siriwattananon and Mihara, 2004). The reasons why the pellet compost was developed were explained, and how to make the pellet compost was demonstrated with a small-scale mincing machine delivered to the farmers. The participants surely agreed that the pellet compost is another kind of organic fertilizer which is not so complicated to produce, more comfortable to use, easy to keep, and reduce nutrient loss by heavy rainfall or surface runoff. However, making pellet compost requires the mincing machine, and it is the problem for the local farmers as they cannot afford. According to the questionnaire survey, only 11% of the workshop participants have made pellet compost and applied it on their crops, but the other villagers have never produced pellet compost (Fig. 5). The farmers responded that the donated mincing machine is too small comparing to the amounts of pellet compost they need to apply in their farmlands, so they just applied the conventional compost directly. This survey also showed that there are high possibility to be widely advanced in making and applying pellet compost if a bigger mincing pellet machine could be set up.

Now these local farmers have understood well about the benefits of compost and pellet compost making and its application, and most of them are able to explain this technology to other local people outside the village.

Local acceptability on bio-pesticide

Bio-pesticide is a good alternative to chemical insecticide the farmers used to apply, concerning about the farmers' health, food safety and water conservation. To transfer the knowledge of using bio-pesticide to the local farmers, two workshops were conducted and 4 model organic farms were promoted in Wat Chas village in 2008 (Fig. 4).



Fig. 4 Farmers making bio-pesticide in the workshop (left) and one of the four model organic farm of the farmers (right)

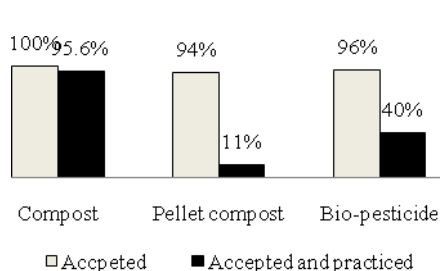


Fig. 5 Percentage of farmers acceptability on organic farming practices

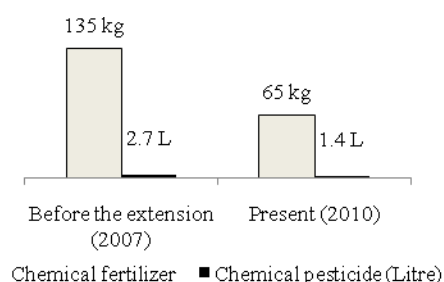


Fig. 6 Reduced amount of chemical fertilizers and pesticides use in household per year

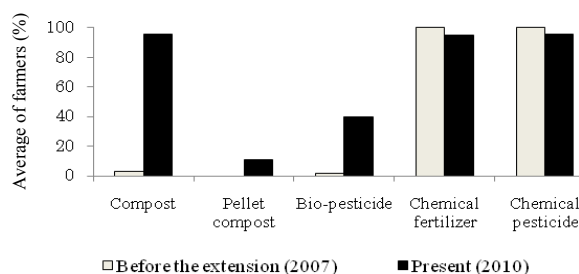


Fig. 7 Change in application with organic farming of farmers before and after the extension activities

The farmers were taught about making and applying bio-pesticide using the available materials in the village. Also, the impact of applied chemical insecticides on health, agricultural products and water resources was shown and explained in the workshops. A bucket was delivered to each owner of the model organic farm for making bio-pesticide. After applying, the farmers saw that bio-pesticide was also effective in chasing or killing the insects, but it required the farmers to spray it more often, 3-4 times per week. Many farmers in the village have learned about the effective of bio-pesticide and known how to make it using local materials. Due to the results of the survey, 40% of farmers who participated in the workshops have made and applied bio-pesticide, but all of them still sometimes applied chemical insecticide. The people answered that they may still apply chemical pesticide because making and applying bio-pesticide need times and require them to spray more often, even chemical insecticide is much more expensive. So, some encouraging activities of using bio-pesticides such as providing some rewards for farmers who apply bio-pesticide or some kinds of promoting the markets for organic products should be considered.

Evaluation of farmers' participation

There are various levels or degrees of farmers' participation. The evaluation of the farmers' acceptability on organic farming of this study was discussed on the basis of the participation levels developed by Pretty (1995), which has 7 levels as shown in Table 1.

In the initial stage of the extension activities, farmers' participation was evaluated as Level 3, participation by consultation as the farmers participated by answering the questions. Also in 2008, following activities were implemented; introducing the farmers how to make pellet compost, initiating 4 model organic farms, leader training on making bio-pesticide, and conducting workshops on sustainable agriculture through applying pellet compost. In addition to the extension activities, surveys by interview or questionnaire for evaluating local farmers' acceptability on organic agriculture were implemented occasionally. According to the results of the questionnaire survey, the farmers' participation was evaluated as Level 5, functional participation as the farmers participated by forming the groups to meet the predetermined objectives of the extension project. This result was similar to the study of Siri Wattananon and Mihara (2006), conducted in Khon Kaen of Northern Thailand, and Ngo and Siri Wattananon (2009) which showed that in the 1st workshop farmers participation was very low at Level 2 or 3 but this became very high at Level 6 in the 3rd workshop after the farmers understood well about the benefits of the compost. Thus, it was considered that building local farmers' confidence through various extension activities is the most important key to increase local acceptability.

CONCLUSION

According to the results and discussions done in this study, it can be concluded that the extension activities for enhancing sustainable agriculture through conducting workshops and model organic farm demonstrations have favorable effect on change in amount of chemical fertilizers and insecticides used by the local farmers. The compost technology was highly accepted by the local farmers, but the pellet compost technology was not widely adapted with the reasons that the mincing machine was too small. The local people found bio-pesticide is really good for the farmers' health, food safety, and environment, but they still continue applying chemical insecticides sometimes as applying bio-pesticides required more times. So, some more encouraging activities on making and applying bio-pesticide such as providing some rewards for farmers who apply bio-pesticide or some kinds of promoting the markets for organic products should be considered. It was concluded that building local farmers' confidence through various extension activities is the most important key to increase local acceptability.

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