



Evaluating Participation Level of Farmers in Project on Promoting Sustainable Farming Systems in Samroung Commune of Kampong Cham Province, Cambodia

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Abstract In Cambodia, 71% of labor force engage in agricultural sector and contribute 36% on 2010 of Gross Domestic Products. Recently, conventional farming based on agro-chemicals application is a major farming practice in the country. However, the application of agricultural inputs, especially chemical pesticides are not appropriate from a point of view of sustainable farming practice. As the mainstream farming systems based on agro-chemicals are not only deteriorating natural environment and ecosystem but also affecting human health. For preventing these impacts, attention has been paid to sustainable farming systems. For promoting sustainable farming systems based on natural resource circulation, Institute of Environment Rehabilitation and Conservation (ERECON) and Tokyo University of Agriculture implemented project in Samroung commune of Kampong Cham province, Cambodia since April 2011. From previous studies, it was concluded that extension approaches which are applied in Samroung commune is effective in order to change farmer's awareness for converting their farming system. In addition, the farmers in Samroung commune have motivation and potential for converting from conventional farming systems to sustainable farming systems. However, for understanding participation level of farmers properly, this study evaluate participation level of farmers from 2011 to 2013 and examine appropriate incentive for improving participation level based on the questionnaire and interview survey. This study concluded that participation level of farmers was improved through project activities year by year and there are some incentives for improving farmer's participation level. It can be said that participation level was improved according to change of interests and build incentives related to project activities.

Keywords participation level, sustainable farming systems, sustainable agriculture based on natural resource circulation

INTRODUCTION

According to Ngo and Siri wattananon (2009), agriculture has utmost important role for reducing poverty and improving the capacity for human resource development in rural area. On 2010, Cambodia has population of 14 million and 71% of labor force engages in agricultural sector and contributes 36% of Gross Domestic Products (Asian Development Bank, 2011). In this country, conventional farming systems based on agro-chemicals become a mainstream to meet market's demand. But chemical pesticides effect not only positive but also negative for the environment and human. It is also a problem that farmers do not have enough knowledge about applying agro-chemicals.

For producing foods and fiber materials on a sustainable basis harmonizing agricultural production with the natural environment, the conversion from conventional farming systems to sustainable farming systems is considered. In this study, sustainable farming systems is defined as a

system that can evolve indefinitely toward greater human utility, greater efficiency of resource use and a balance with the environment which is favorable to humans and most other species (Harwood, 1990).

For promoting sustainable farming systems based on natural resource circulation, Institute of Environment Rehabilitation and Conservation (ERECON) and Tokyo University of Agriculture implemented project in Samroung commune of Kampong Cham province, Cambodia since April 2011. For 450 local farmers as well as students and teachers in 10 elementary schools, the project not only extended techniques for sustainable agriculture but also supported to form farmers' group, organize project team on agricultural market survey and product sales, educate teachers through leader training, and establish Pellet Compost Center in Samroung commune. From previous studies, it was concluded that extension approaches which are applied in Samroung commune is effective in order to change farmer's awareness for converting their farming system. In addition, the farmers in Samroung commune have motivation and potential for converting conventional farming systems to sustainable farming systems. However, for understanding awareness of farmers properly, participation level also needs to be studied.

According to Chambers (2005) cited in Beatrice (2008), participation enables people to realize their rights to participate in and access information related to the decision-making processes which affect their lives. Pretty (1995) stated that participation is one of the critical components of success. His analysis also revealed that the outcome is seen as participation when people's ideas and knowledge are valued and power is given to them to make decisions independently of external agencies. On the other hand, Beatrice (2008) studied that development program with top-down initiatives hardly reach the people which the programs are meant for.

In order to understand participation level of farmers properly, this study evaluate participation level of farmers and examine appropriate incentive for improving participation level based on the questionnaire and interview survey conducted in Samroung commune of Kampong Cham province, Cambodia. This study defines incentive as something that encourages people to do something (Oxford dictionary, 2005).

STUDY SITE

Study site of the study comprised of 11 villages which are located in Samroung commune, Phrey Chhor district, Kampong Cham province, Cambodia. This commune is located 83 kilometers from Phnom Penh city (Fig. 1). The commune has population of 8,111 people on 2011 (ERECON, 2011). Main agricultural product is paddy rice mainly for both of sales and self-consumption, meanwhile, several kinds of vegetables also produced by farmers In Samroung commune, agro-chemicals are applied for production in order to increasing yield.

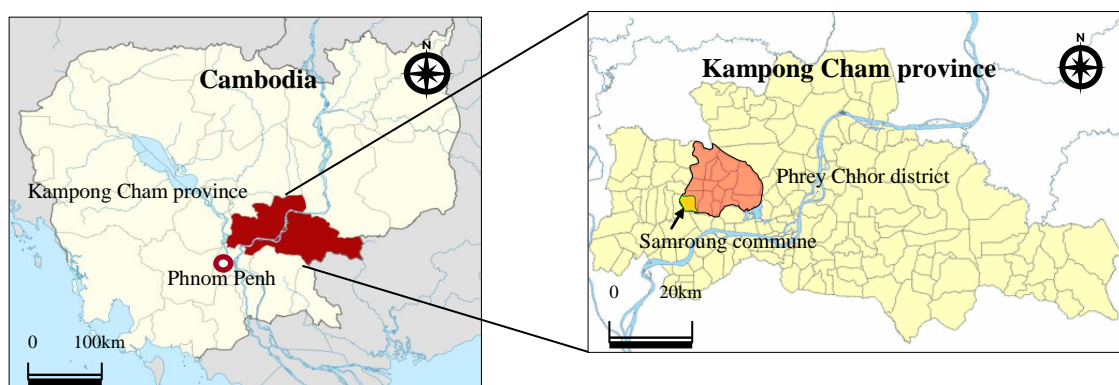


Fig. 1 Location of Samroung commune in Kamong Cham province

METHODOLOGY

In this study, incentive of improving participation level of farmers in Samroung commune was studied. For achieving objective, the study was advanced through 1) questionnaire survey, 2) interview and 3) field investigation. Through questionnaire survey and field investigation, 9 farmers who have high participation frequency compare to other farmers were selected for understanding their incentives through questionnaire survey (Fig. 2). The questionnaire was designed to measure 1) farmer's time sharing for agricultural activities including technical training, meeting, etc. and 2) comparison of their former and present interests related to agricultural activities. Besides, some farmers who not only participates activities such as meeting frequently but also considers improving their circumstances voluntarily were interviewed for detail information.



Fig. 2 Conducting questionnaire survey

Table 1 A typology of participation

No.	Typology	Characteristics of each type
1	Manipulative Participation	Participation is simply a presence, 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. In 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), Mihara and Yamaji (2004)

In addition, participation level of farmers was evaluated and compared from 2011 to 2013 based on the participatory level developed by Pretty (1995) which is cited in Mihara and Yamaji (2004). The typology of participation is divided into seven types as Table 1. It is because that high participation of farmers is essential for sustaining output of the project.

RESULTS AND DISCUSSION

Typology of Participation

Through observation of farmer's contribution and participation frequency toward project activities and interview, participation level was measured by authors based on typology of participation composed by Pretty (1995). In initial stage of the project on 2011, typology of participation of farmers was level 2, participation by consultation. It is because interviewees mainly answered questions and consulted by project implementer. But on 2013, farmer's participation level was marked as level 5 or 6 because members of farmers' group start to communicate and share knowledge each other. Moreover, key farmers especially committee members of farmers' group started to participating decision making on action plan and expanding techniques for sustainable agriculture to other farmers. However, some farmers who have high participation level evaluated as level 7 because they consider problems by themselves and improve their environment voluntary. For example, some farmers set irrigation system in vegetable farm, expand their vegetable field by fill up pond with soil, start collaboration with private company for vegetable selling, and dig big pond near vegetable field without recommendation from implement organization. They also try to improve agricultural techniques of other farmers based on natural resource circulation through showing, explaining and accepting visitors at their farm.

Result was similar to the studies of Siritattananon and Mihara (2006), and Ngo and Siritattananon (2009). Their studies described that participation level at the 1st workshop was very low at level 2 or 3 but it changed to level 6 in the 3rd workshop after farmers understood well about benefits of introduced technique.

Change of Time Sharing for Agricultural Activities after the Project Implementation

For promoting sustainable agriculture based on natural resource circulation, the project implemented several activities. For example, from April 2011 to March 2012, 41 technical trainings about techniques for sustainable agriculture were implemented and totally 414 farmers were participated. Project team meeting and additional training such as pellet compost making were also conducted for key farmers such as committee members of farmers' group occasionally. In addition, technical trainings were also conducted at Thailand and Japan in order to learn advanced agricultural techniques, management system of farmers association, etc. Totally 20 farmers participated in these trainings in 2012 and 2013. (ERECON, 2012 and 2013).

By asking change of working time on agricultural activities, it was revealed that many farmers became busy after project started because project implementer organized many kinds of technical training, meeting, and etc. Normally, technical training organized by two hours and meeting at least an hour. However, some farmers who have incentives participated these kinds of activities properly even they were busy with their own activities.

By asking reasons of their participation, 100% of interviewee answered 1) learning knowledge and techniques related to sustainable agriculture, 2) holding the relationship with international Non-Governmental Organization (ERECON), 3) taking materials for conducting sustainable agriculture by ERECON, and 4) contributing improve farming way in Samroung commune were reasons of their time sharing (Fig. 3).

It can be said that farmers hope to learn and improve knowledge and technique to sustainable agriculture because it will be contribute to improve farming way in their commune. Michael (1997) mentioned one of issues on participation is acceptability of implementer. For proving it, good relationship with project implementer, international Non-Governmental Organization, is also answered as reason for farmer's time sharing.

Beatrice (2008) found that lacking of funds to start up business after training is one of limitation for improving participation level. As same as Beatrice, result of questionnaire shows that distribution of necessary materials for conducting sustainable agriculture is also important incentive for farmers. In addition, all of trainees of technical training at Thailand and Japan from

target group answered these kinds of technical training were surely one of incentives for keeping their time sharing. Therefore, project activities and relationship with implementer seems important factor to change participation level of target farmers.



Fig. 3 Making compost with supported compost box (left) and farmers learned how to make bio-fertilizer through technical training in Thailand (right)

Changes in Interests in Sustainable Agriculture of Farmers before and after the Project Implementation

For understand project impact toward awareness of farmers on sustainable agriculture, their interests in sustainable agriculture before and after the project implementation were compared (Table 2). Results of questionnaire survey showed that it was obvious that interest in sustainable agriculture of interviewee seems to change after the project implementation. As mentioned before, farmers increased their interest on sustainable agriculture through project activities such as meeting, technical training and practicing of techniques for sustainable agriculture.

Although almost all of farmers had interest to increase crops yield by conventional farming systems before the project, nobody hope to increase yield by conventional farming systems after the project implementation. It is because that farmers start to care more about their health and reduction of expense for agro-chemicals.

Table 2 Interests of farmers before and after the project implementation on April 2011

No.	Interest related to agricultural activities	Answer (N = 9)	
		(Before)	(After)
1	To increase yield of crops by applying chemical fertilizer and pesticide	8	0
2	To sell many kinds of crop to middleman	7	3
3	To grow crops with lower chemical input	5	8
4	To make higher quality compost	2	9
5	To use bio-fertilizer with higher quality	2	8
6	To use bio-pesticide with higher quality	2	9
7	To build up collaboration with private company	1	7
8	To build up collaboration with NGO (ERECON)	1	9

Source: Questionnaire survey in 2013, ERECON

In addition, almost all of interviewee increased their interest on improving technique for sustainable agriculture such as compost, bio-fertilizer and bio-pesticide. Target farmers also increased interest on build up collaboration with private company and NGO. It can be considered that farmers start to think collaboration with private company because the project tries to expand collaboration with private company in order to sell agricultural products widely. Some private companies visited and observed some farmers for checking possibility of further collaboration.

CONCLUSION

According to the results and discussion done in this study, participation level was level 2 on 2011 because target farmers just answered questions and consulted by implementer. Farmers also participated in activities after contents and schedule decided by implementer. However, it was changed to level 5 or 6 on 2013 and members of farmers' group start to communicate and share knowledge each other. In addition, key farmers especially committee members of farmers' group started to participating decision making on action plan and expanding techniques for sustainable agriculture to other farmers. Some farmers became participation level 7 because they consider and try to improve their circumstances by themselves.

Besides, it can be concluded that there are some incentives for improving farmer's participation level. These are 1) build motivation for learning, 2) relationship with implementer, 3) distribution of materials and 4) participation to technical training in other countries. In addition, project activities seem to change interest of farmers from conventional farming systems to sustainable farming systems.

It can be said that participation level was increased according to change of interests and build incentives on project activities from 2011 to 2013. So, for promoting sustainable farming systems effectively, further project needs to be designed for improving farmers' interests and incentives through various activities and communication between target farmers and project implementer.

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REFERENCES

- Asian Development Bank. 2011. Key indicators for Asia and the Pacific 2011. (Available from; www.adb.org/statistics).
- Beatrice, O. 2008. Strengthening rural agricultural training program through participation and training needs assessment. Netherlands.
- ERECON. 2012. Annual report 2011 of program on promoting sustainable agriculture at Kampong Cham province in Cambodia. Consortium of Institute of Environment Rehabilitation and Conservation and Tokyo University of Agriculture, Japan.
- ERECON. 2013. Annual report 2012 of program on promoting sustainable agriculture at Kampong Cham province in Cambodia. Institute of Environment Rehabilitation and Conservation, Japan.
- Harwood, R.R. 1990. The history of sustainable agriculture. In *Sustainable Farming Systems*. Edwards et al. (eds), 3-19.
- Michael, K. 1997. Participation in development: The question, challenges and issues. A Symposium Background Paper. Symposium on participation in development; the question, challenges and issues.
- Mihara, M. and Yamaji, E. 2004. Participatory strategy for soil and water conservation. Institute of Environment Rehabilitation and Conservation, 231-240, Japan.
- Ngo, B. and Siri Wattananon, L. 2009. Suitable timing of application of pelletized compost and farmers' acceptance in Cambodia. *J. ISSAAS*, 15 (1), 91-100.
- Oxford Advanced Learner's Dictionary (Seventh Edition). 2005. Oxford University Press. UK.
- Pretty, J. 1995. Participatory learning for sustainable agriculture: *International Institute for Environment and Development, World Development*, 23 (8), 1247-1263.
- Royal Government of Cambodia, et al. 2002. Integrated pest management farmer training project Cambodia. Royal Government of Cambodia, Cambodia, 1-7.
- Siri Wattananon, L. and Mihara, M. 2006. Granular compost development and farmers' adaptability in Khon Kaen, Northeast Thailand. *Journal of Arid Land Studies*, 154, 483-486.