



# Area Based Management Extension for Sustainable Rice Production: Lessons Learned from Sustainable Rice Farmers Groups in Det Udom District, Ubon Ratchathani Province

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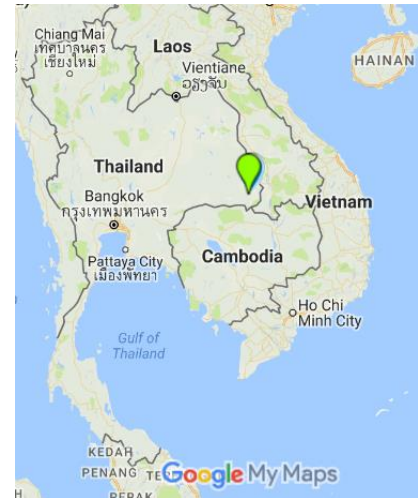
**Abstract** Lessons learned by farmers' groups in Thailand who received area based management extension for sustainable rice production were investigated. Objectives were to 1) study area based management extension for sustainable rice farmers' groups, 2) analyze the current situation regarding area based management extension of these groups, 3) identify key actions for group improvement, and 4) determine the lessons learned. Qualitative data were collected from 77 sustainable rice farmers belonging to two farmers' groups in Det Udom district, Ubon Ratchathani Province during an organized forum. Additional data were collected and analyzed from key informants including group chairmen and extension officers using in-depth interviews. Results were as follows: 1) the farmers' groups were founded as Community Rice Centers producing seed, and later joined the Area Based Management Extension Program initiated by the Ministry of Agriculture and Cooperatives to increase their knowledge capacity and market linkage. They also participated in the Sustainable Rice Production Pilot Testing Project organized through collaboration between the Thai Rice Department and Better Rice Initiative Asia Project to link with sustainable rice new value chains. 2) Farmers were assessed regarding their current practices against their compliance score of the Sustainable Rice Platform (SRP) standard and received scores averaging 74.5%. After knowledge transfer, their scores were audited by an external auditor and increased to an average of 84% classified by the 'Working toward Sustainability' level. 3) Actions for group improvement were identified as follows: (i) Farm record, (ii) Land preparation, (iii) Planting method, (iv) Seeding service management, (v) Fertilizer management (vi) Weed management, (vii) Combine harvester machine management, (viii) Selling, and (ix) Internal control system management. 4) Valuable lessons learned concerning sustainable rice area based extension included: (i) Good knowledge transfer of sustainable rice production through group actions, (ii) Limited access through machinery service of introduced technology, and (iii) Economy of scale in area based management extension planning between cultivated areas and market capacity.

**Keywords** sustainable rice production, area based management extension, Ubon Ratchathani Province

## INTRODUCTION

Present day Thai rice farmers are smallholders with around 2.88 hectares per household (Apichart, 2014). Generally, only 1-2 elderly people work on each farm as husband and wife and employ no permanent labor. To provide effective extension support to smallholder farmers, the Ministry of Agriculture and Cooperatives (MOAC) has promoted area based management extension to enhance capacity to capably deal with the rice value chain. Furthermore, the current trend of the global rice sector is looking toward sustainability in sourcing rice production and resource consumption through global collaboration under the Sustainable Rice Platform (SRP). This is a multi-stakeholder platform co-convened by the UN Environment Programme (UNEP) and the International Rice Research Institute (IRRI) to promote resource efficiency and sustainability in trade flows, production, consumption and supply chains in the global rice sector (Overview of Sustainable Rice Platform, 2017).

The two farmers' groups in Det Udom District, Ubon Ratchathani Province as shown in Fig. 1, follow Good Agriculture Practice (GAP) as 'Best Practices Group', and are keen to learn about new rice farming methods. They operate as Community Rice Centers (CRCs) and have also been participating in Area Based Management Extension and Sustainable Rice Production Pilot Testing Projects run by the Thai Rice Department and Better Rice Initiative Asia (Thailand) Project through cooperation between GIZ, Bayer, and Olam. These two farmers' groups have objectives to improve the capacity of their members by applying area based management extension to deliver rice to the market at a sustainable value. Therefore, this research was conducted to investigate group improvements regarding their objectives.



**Fig. 1 Location of farmers' group**

## **OBJECTIVES**

The following issues were investigated to 1) study area based management extension for sustainable rice farmers' groups, 2) analyze the current situation regarding area based management extension of these groups, 3) identify key actions for group improvement after applying area based management extension, and 4) appraise the lessons learned.

## **METHODOLOGY**

### **Research Approach**

Qualitative research was administered in the case study.

### **Research Population**

The research population consisted of 77 farmers as members of Bua Ngam Community Rice Center (32 farmers) and Klang Community Rice Center (45 farmers) in Det Udom District, Ubon Ratchathani Province. These two community rice centers also received support from the Ministry of Agriculture and Cooperatives (MOAC) and the Better Rice Initiative Asia (BRIA) Project for an area based management extension approach.

### **Data Collection**

1) Forums were organized to assemble qualitative data from 32 Bua Ngam Community Rice Center Members and 45 Klang Community Rice Center members including group leaders and committee members.

2) Semi-structured in-depth interviews were conducted with key informants to collect data involved in transferring knowledge of sustainable rice production and market linkages including group chairmen, committee members and extension officers.

### **Data Analysis**

Data were analyzed for content.

## **RESULTS AND DISCUSSION**

### **1. General Information Regarding the Groups Participating in Area Based Management Extension for Sustainable Rice Production**

Bua Ngam Community and Klang Community Rice Centers consist of rice farmers' groups in Det Udom district, Ubon Ratchathani Province, Northeastern Thailand. Fundamentally, Community Rice Centers (CRCs) are organized to provide quality seed supply to rice farmers. Seed production requires intensive cultivation and good crop knowledge; however, the Thai seed market is limited, with pre-orders insufficient to share among all members in the group, and farmers also need to produce their own grain. Usually, farmers produce grain as uncertified or conventional rice. The Ministry of Agriculture and Cooperatives has been promoting area based management programs or mega-farm projects by supporting CRCs to increase their capacity for knowledge transfer and market linkage. These two CRCs participated in area based management extension programs to gain knowledge regarding input supply management and good cultivation techniques such as seed selection, organic fertilizer, bio-pesticides, straw and stubble management. They also received support through the provision of certified seed, soil test analysis, and seeding machines.

In addition, these two CRCs participated in the Sustainable Rice Production Pilot Testing Project. They now have high potential to reach a sustainable rice standard and become part of a new sustainable rice value chain with economy of scale and good basic rice cultivation. During the pilot testing project, these two CRCs were encouraged to gain knowledge of sustainable rice production and sustainable rice value chain, designed with reference to SRP standards and indicators developed by the IRRI and SRP. The project began by recruiting 77 interested farmers as volunteers. An introductory meeting was held with the two CRCs and project officials to formulate operation plans. Initially, all interested farmers were asked to change their production practices and a production target of sustainable rice was set at 550 metric tons for the 2016/2017 crop, with purchase guaranteed at a competitive market price.

### **2. Analysis of the Current Situation Regarding the Area Based Management Extension for Sustainable Rice Farmers' Groups**

The CRCs desired to improve their rice cultivation practices and attain certification as 'sustainable rice standard', with ability to link with the sustainable rice value chain. Some committee members and members of the CRCs volunteered to implement sustainable rice production. Sustainable rice production knowledge was new to all the farmers. The two farming groups interacted with the project by joining the pilot testing process implemented by the Thai Rice Department and BRIA (2017b). The objectives were to 1) receive sustainable rice production program introduction, 2) benchmark current practices to the sustainable standard, 3) analyze the risks faced during rice production, 4) attend training, 5) undergo participatory monitoring and follow-up farmers' practices, 6) be audited by an external auditor, 7) organize a participatory harvesting plan, 8) monitor a selling plan, and 9) participate in an after action review workshop. Before participating in the program, all 77 interested farmers were assessed based on their current practice against the compliance score of the SRP standard. Average score was 74.5%. After participating in the program, their average compliance score assessed by a third-party auditor increased to 84% classified by the 'Working toward Sustainability' level.

Farmers were trained to apply sustainable rice production, which complied with the standard; however, the sustainable rice produced by these farmers also required good management and delivery to the market as sustainable value chain. Sustainable rice was distinguished from conventional rice. Economies of scale in terms of numbers of participating farmers, expected paddy volumes, milling capacity and internal group management were all considered by the groups for market linkage planning. Initially, the farmers planned to produce around 500 metric tons of sustainable rice but when the selling season ended only 298 metric tons were delivered for milling. Furthermore, the market linkage aspect of area based management extension enhanced farmers' capacity to reach the market. This is an important incentive mechanism for farmers, similar to the market-oriented extension paradigm that links the private sector and farmer (Swanson & Rajalahti, 2010).

**Table 1 Challenge topic, objective, Group Action, and action result in year 2016**

Challenge Topic	Objective	Group Action in 2016	Action Results in 2016
1. Farm record	100% Farmers must be able to monitor farm records by themselves.	1. Farmers' groups attended a step-by-step farm record workshop organized by extension officers, 2. Farmers' groups continued recording by themselves.	90% of farmers could record their own data with around 80% completing the record sheets.
2. Land preparation	To attain good land leveling.	1. Farmers' groups received direct training from extension officers.	Only 50% of farmers applied conventional leveling in small areas due to financial difficulties and technology/service provider availability in the area.
3. Planting method	Reduce seed rate by applying a seeding method.	1. Farmers' groups received direct training from extension officers.	80% of farmers applied broadcasting methods while only 20% applied a seeding machine due to lack of machine availability.
4. Seeding service management	Provide services to all members on time.	1. Farmers' groups received seeding machines from the Area Based Management Extension Program. 2. Farmers' groups conducted Demo Training on a plot for the seeding machine together with extension officers.	Only 20 % of farmers used the seeding machine as time constraints resulted from late machine arrival and some farmers had already planted their crops. More planting machines are required.
5. Fertilizer management	Increase yield and lower input cost by applying suitable fertilizer formula at appropriate rate and time.	1. Farmers' groups received direct training in soil and nutrient management by experts. 2. Farmers' groups sent their soil to be analyzed.	80% of farmers applied suitable fertilizers. Soil test results came late. Farmers applied fertilizer following general recommendations.
6. Weed management	Improve yield and apply safety methods if the farmer uses herbicides.	1. Farmers' groups received direct training from extension officers.	Only 10% of farmers applied herbicides. 20% of farmers used hand weeding and 70% used hand weeding and cutting.
7. Combine harvester machine management	All farmer can access a combine harvester on time.	1. Group harvesting and selling plans were organized for farmers' groups.	60% of farmers had access to a combine harvester machine on time.
8. Selling	Deliver sustainable rice volume as agreed.	1. Group harvesting and selling plans were organized for farmers' groups.	60% of the total crop was sold to the selected millers. This did not meet the agreed amount because farmers kept some rice for personal consumption and seed.
9. Internal control system management	To have self-inspection within farmers groups.	1. Farmers' groups have been implementing internal inspection for seed production.	70% of farmers could do self-inspection for seed production. This was not yet implemented for sustainable grain.

### **3. Action Identified for Farming Group Improvement after Applying Area Based Management Extension**

The two area based management extension farmers' groups also participated in a pilot testing project as mentioned earlier. At the end of the sustainable rice production in 2016, the 77 farmers participated in a workshop to review their actions and the results of their actions. Challenge topics were identified and selected by the farming group committees, the Thai Rice Department and the BRIA Project. Audit reports were also examined by third-party auditors. Results of the challenge, group action and action results are shown in the Table 1.

### **4. Lessons Learned**

Valuable lessons learned from the sustainable rice area based extension model were categorized into three aspects as follows:

**4.1 Good knowledge transfer of sustainable rice production through group actions:** Farmers were audited and received an average compliance score of 84% of the SRP standard (Thai Rice Department & BRIA, 2017a). Scores indicated a good understanding, with improvement shown by these farmers after implementing the participatory actions of attending direct training from extension officers (experts regarding the topics), attending special workshops, attending demonstrations at training plots and also receiving some machines or service. There were no major issues noted by the farmers at either of the two community rice centers; however, no farmers implemented good land leveling due to lack of a reliable and efficient technology service providers available in the area. Most of the farmers did not use any herbicides, pesticide, or fungicides and this resulted in a high weed problem. Refer to post survey report from BRIA demo training plot in 2017. Farmers who implemented good seeding machine technique and good weed control increased gross profit margin by 53.90% through input cost reduction and higher yield (Department of Agricultural and Resource Economics, 2017). The Farmers' Diary workshop that provided step-by-step training was a key success factor and encouraged farmers to record important data related to crop production by themselves. Group actions significantly improved sustainable rice production.

**4.2 Limited access through machinery service of introduced technology:** The Farmers had a good understanding of sustainable rice production with intention to apply the newly introduced technology; however, there were limitations with regard to machine hire service providers including seeding machines, good land leveling machines, and combine harvesters. The farmers realized that seeding machines could reduce their seed rate but numbers of seeding machines were insufficient. Demonstration of a large field project trial in Thailand using mechanized seeding (drum seeder) indicated significant gains in rice farming profitability. Farmers realized that yield can be improved using mechanized seeding machines (Stuart et al., 2017). Farmers tried to reserve combine harvesters when 80% to 85% of their rice grains were ripe but numbers of these machines were limited. Therefore, as well as knowledge transfer, machine management or service provider management should be considered in area based management extension projects.

**4.3 Economy of scale in area based management extension and planning of cultivated area and market capacity:** Sustainable rice segregation requires matching milling capacity (drying and storage capacities) and wet paddy. Participating farmers had to be well-organized with proper management. Most farmers grew the Hom Mali rice variety. This variety is photoperiod sensitive and ready for harvest by early November. In addition, farmers used combine harvesters and sold wet paddy to the miller. The number of farmers and the harvested area size must match the available milling capacity. The capacity of one drying machine is around 500 metric tons per day. Farmers' groups planned, through the project, to deliver 500 metric tons from 77 farmers. It was impossible to harvest the rice of 77 farmers in one day and deliver the product to the selected miller to maintain full milling capacity. Another issue was that when the crop was harvested, only 298 metric tons were sold to the selected miller because the farmers kept some of their production for consumption and seed supply. Therefore, area based management extensions must address the economy of scale between market capacity and farmers/cultivated area as one of the key success factors to build a new sustainable rice supply chain.

## **CONCLUSION**

A total of 77 farmers from two community rice centers in Det Udom District, Ubon Ratchathani Province participated in the Area Based Management Extension Project organized by the MOAC, and also SRP pilot testing through cooperation between the Thai Rice Department and BRIA Thailand. The farmers received training regarding sustainable rice production through learning activities with extension officers including attending direct training sessions and special workshops. After participating, using the existing farmers' group structure of mega-farm projects, benchmarking with current practices and receiving additional sustainable rice production knowledge, the 77 farmers were able to produce rice sustainably. In addition, the area based management extension should involve more farmers. When farmers are introduced to a new technology, machine and service provider management should be taken into account. Furthermore, market linkage management in terms of economy of scale between market capacity (especially drying capacity of the miller) and cultivated size under area based management extension were determined as key success factors for farmers to link with the market and develop a new sustainable rice supply chain.

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