

The Management Efficiency Of The Community Rice Center For Commercial Rice Seeds Production In Kamphaeng Phet, Thailand

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Abstract:

This research aimed to compare the opinions of community rice center members on the management efficiency of the community rice centers (CRCs) for commercial rice seeds production according to the potential of the CRCs in Kamphaeng Phet Province, as well as proposed guidelines to increase the management efficiency of CRCs according to the potential of the CRCs. This research was a mixed research method. Quantitative analysis was exploratory research. The sample size was 217 members by simple random sampling. Data were collected by interview. Data analysis by descriptive statistics and F-test were analyzed by one-way ANOVA analysis. Qualitative analysis by interviewing with four presidents of CRCs that commercial rice seeds production using content analysis. The study found that the comparison of opinions toward the management efficiency of the CRCs for commercial rice seeds production according to the potential of the CRCs. Overall, there was a significant difference in management efficiency at the 0.05 level ($F=23.58$), and it was found that each CRCs had different management efficiency. Therefore, the guideline development to increase the management efficiency of the CRCs for commercial rice

seed production should be the approach for the CRCs according to the potential of the community rice center.

Keywords: Commercial rice production, community rice center, management efficiency Abbreviation: Community rice centers (CRCs)

Introduction

The Community Rice Centers (CRCs) is a farmers' organization supported by the Ministry of Agriculture and Cooperatives since 2000. Its role is to produce and distribute good quality rice seeds in the community and serve as a learning center for transferring rice production technology. There are 2,478 registered community rice centers from 74 provinces under the Rice Department's supervision (Bureau of Rice Production Extension, 2021). The Community Rice Center operates in a community-participative management service "by farmers for farmers," focusing on systematic networking with representatives of the community rice center by establishing management committees at all levels, namely the center, province, region, and country levels. It is a truly representative organization for farmers nationwide. However, in the past promotion and development of community rice centers, there were still limitations such as intermittent budget support, lack of good quality rice seeds, and the CRCs were unable to manage and operate; as a result, The CRCs lacked strength and were unable to carry out various activities effectively (The Rice Department, 2023). Thus, management is the key mechanism to help develop the operation of the community rice center from the center, province, region, and country level to be efficient and enable to produce and distribute good quality rice seeds in the community. It is essential to choose proper management for the organization and apply it for maximum benefit (Leklersindhu, 2018). For this reason, it is necessary to have management that covers operations, processes, activities, and essential management principles that lead to success. These principles include planning, organization, staffing, directing, coordination, reporting, and budgeting, according to the POSDCoRB theory of Luther H. Gulick and Lyndall Urwick (Gulick, 1937), where all aspects must be consistent, resulting in smooth and effective management.

Kamphaeng Phet Province serves as a case study. There are 35 community rice centers under the supervision

of the Kamphaeng Phet Rice Seeds Center, which produces and sells rice seeds, and has a group of rice seeds producers, registered and certified seeds. Moreover, they have been awarded the National Institute of Outstanding Farmers Branch of the group of rice seeds producers for four consecutive years from 2019 to 2022 (Ministry of Agriculture and Cooperatives, 2022). So, Kamphaeng Phet Province has enormous potential for rice seed production, and the management efficiency of community rice center management should be further developed for sustainable commercial rice seed production. This research is of great interest and importance to study the management efficiency of the CRCs on commercial rice seeds production in Kamphaeng Phet Province, Thailand, by comparison of farmer members' opinions toward community rice center management according to the potential of the CRCs. The results of this study can be used as a guideline for developing and enhancing the management efficiency of the community rice center for commercial rice seeds production and maintaining the existing personnel to work with the community rice center appropriately and sustainably.

Materials and Methods

Population

The population in this study are 35 community rice center members in Kamphaeng Phet Province which are classified into groups 13 centers for planting areas for rice seeds and good quality rice, and 22 centers for only planting good quality rice, a total of 1,226 members.

Sampling

The sampling in this study is community rice center members have two types:

- 1) The sample group for qualitative data collection with the president of 4 community rice centers.

- 2) The sample group for quantitative data collection has two steps:

- Step 1: The population was members of 35 community rice centers in Kamphaeng Phet Province, with 1,226 members. The researcher conducted purposive sampling with 13 centers for planting areas for rice seeds and good quality rice, consisting of 473 members.

Step 2: The researcher classified community rice centers according to the potential of the CRCs in Kamphaeng Phet Rice Seeds Center (Kamphaeng Phet Rice Seeds Center, 2020), including the community rice center members with extremely high potential (Grade A) had 23 samples, high potential (Grade B) had 114 samples, and moderate potential (Grade C) had 80 samples. Randomly selected sampling and calculated the sample size according to the formula of Taro Yamane (Yamane, 1973) with 95% confidence. Therefore, the community rice center members' sample size was 217 members.

Research Area

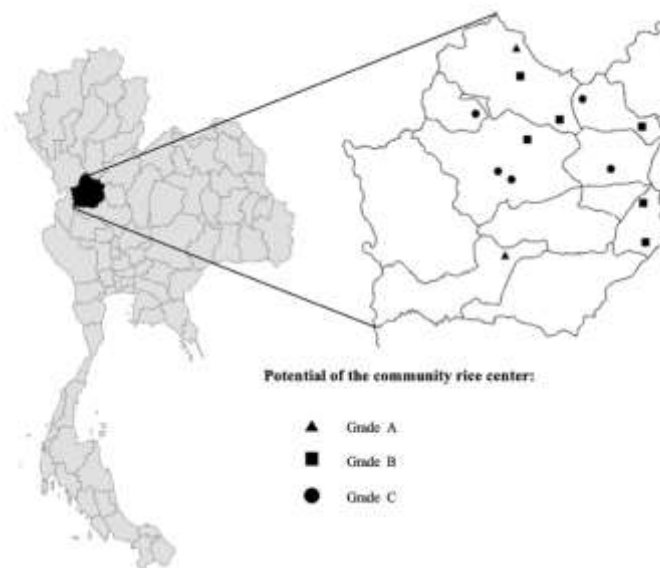


Figure 1: A research area in Kamphaeng Phet

Research Tools

This study was divided into two types: 1) qualitative research tools and 2) quantitative research tools as follows:

1) Qualitative research tools was an in-depth interview with the president of 4 community rice centers that produce commercial rice seeds on recommendations for developing community rice centers for commercial rice seeds production.

2) Quantitative research tools was an interview consisting of three parts: Part 1: Personal Characteristics such as age, experience of planting, and area for planting rice. Part 2: The rice production by farmer members of community rice centers, which includes cost, yield, and price of rice production. Part 3: Opinions of community rice center members towards the managing of community rice centers for producing commercial rice seeds based on the

POSDCoRB theory, which included planning, organizing, staffing, directing, coordinating, reporting, and budgeting. The opinions were divided into five levels using the Likert Scale: 5 Points: the management efficiency of the community rice center is excellent, 4 Points: the management efficiency of the community rice center is good, 3 Points: the management efficiency of the community rice center is fair, 2 Points: the management efficiency of community rice center need to be improved, 1 Point: the management efficiency of community rice center urgently needs to be improved.

Research Tools Test

The interview was tested for confidence by conducting a tryout with a group of farmers with similar characteristics to the sample of 30 people. Then, Cronbach's alpha coefficient was used to determine the confidence coefficient, which was 0.949, and the consistent index of each question with the objective (Index of Item-Objective Congruence: IOC) using five experts was 0.865.

Approval of Ethics by the Institutional Review Board (IRB)

This study was endorsed for research project ethics considerations. According to the ethical guidelines for research in people, that are international standards. By Human Research Ethics Committee Chiang Mai University, Thailand (Project ID: CMUREC No. 65/157).

Data Analysis

The researcher analyzed the collected data using descriptive statistics, including percentage, mean, and standard deviation, to explain personal characteristics and rice production by farmer members of the CRCs. Moreover, in the part analysis of members' opinions towards managing the community rice center in all seven aspects, 49 questions were translated into five levels. The average score of 1.00–1.80 indicates that the community rice center's management efficiency level urgently needs to be improved, 1.81–2.60 indicates the level of community rice center management efficiency needs to be improved, 2.61–3.40 indicates the management level of the community rice center is fair, 3.41–4.20 indicates the management efficiency level of the community rice center is good, 4.21–5.00, indicates the management efficiency level of the community rice center is excellent.

One-way ANOVA analysis to compare opinions towards the management of the CRCs according to the potential of the community rice center included the community rice center members with extremely high potential (Grade A), high potential (Grade B), and moderate potential (Grade C) of the community rice centers. Moreover, the comparison by Scheffe's post hoc comparisons method.

Results and Discussion

Personal Characteristics

The community rice center members with extremely high potential (Grade A) had an average age of 53.65 years, followed by those with high potential (Grade B) who had an average age of 49.91 years. The members of the community rice center with moderate potential (Grade C) had an average age of 55.37 years, corresponding result to Punyakwao (2022) found that organic rice farmers in the upper northern region of Thailand had an average age of 56.67 years, while Mishra, Kumar, and Noble (2012) found that farmers in the northeastern region of Thailand were also in the 50-60 years age range. The high potential of community rice center members (Grade B) had the largest area for planting rice, with an average of 40.91 rai per household, followed by the members with extremely high potential (Grade A), with an average of 30.13 rai per household and members of community rice centers with moderate potential (Grade C), with an average of 28.44 rai per household. Therefore, they had more areas for planting rice than farmers in the upper northern region of Thailand, which averaged 13.50 rai per household (Peuchthonglang, 2022). In an experience of planting rice, it was found that the members of community rice centers with extremely high potential (Grade A) and members of high potential community rice centers (Grade B) had little difference, with an average of 11.78 years and 10.53 years of experience of planting rice, respectively. The Community rice center members with moderate potential (Grade C) had the least experience of planting rice, with an average of 7.36 years. Regarding membership in the community rice center, the members with extremely high potential (Grade A) had an average of 13.39 years of membership, while the high potential community rice center members had an average of 14.96 years of membership, and an average of 12.99

years of membership of moderate member potential (Grade C), this research result was consistent with Nakpeng (2022), who studied the development of indicators for the success of the CRCs and analyzed factors affecting the success of community rice centers in the lower northern region of Thailand found that CRCs farmers had an average membership duration of 14.50 years (Table 1).

Table 1: Personal Characteristics of community rice center farmer members in Kamphaeng Phet, Thailand

Personal Characteristics	Grade A (n=23)		Grade B (n=114)		Grade C (n=80)		Total (n=217)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age	53.65	11.02	49.91	10.80	55.37	8.25	53.18	9.86
Size of area for planting rice	30.13	20.12	40.91	35.43	28.44	17.34	33.48	26.11
Experience in planting rice	11.78	5.30	10.53	8.48	7.36	6.68	8.99	7.46
Year of member CRCs	13.39	0.50	14.96	2.37	12.99	4.40	14.06	3.32

The production of rice by farmer members of community rice centers in Kamphaeng Phet, Thailand

The production of rice by the community rice center members with extremely high potential (Grade A) had an average cost of 7,269.13 baht per rai, with an average yield of 800.00 kilograms per rai, and the selling price of rice production was 9,856.52 baht per ton. The high potential of community rice center members (Grade B) had an average cost of 6,729.03 baht per rai, with an average yield of 827.25 kilograms per rai, and the selling price of rice production was 9,138.75 baht per ton. It can be seen that the selling price of the members of the community rice center with extremely high potential (Grade A) and the high potential (Grade B) had similar selling prices because these two groups have community rice center members who produce rice seeds that are sold back to the Kamphaeng Phet Rice Seeds Center and sold to private companies and must comply with the policy of the Kamphaeng Phet Rice Seeds Center (2020), where will accept the purchase paddy at a price higher than the price of rice production sold by the normal rice mills. As for members of community rice center with moderate potential (Grade C), it was found that only one community rice center produced commercial rice seeds for private companies to buy at a price higher than

the selling price of paddy sold by normal rice mills. In terms of cost, it was also found that the community rice center with extremely high potential (Grade A) and the high potential (Grade B) had similar production costs for rice seeds production, but the community rice center with moderate potential (Grade C) had the lowest production cost.

On the other hand, the community rice center with moderate potential (Grade C) had the highest yield per rai, followed by the community rice center with high potential (Grade B) and the extremely potential (Grade A) respectively. Since, most of them are community rice center that produce commercial rice seeds, which focus on rice seeds production in dry-season rice to get rice seeds to be sold for rice farmers in wet-season rice. As a result, members of the community rice center who produce commercial rice seeds had less yield. Also, rice production in Thailand had problem, such as lack of agricultural water, soil degradation, and outbreaks of rice insect pests (Sangbuapuan, 2013), as well as agricultural areas in East Africa had the same problem. Including poor agricultural practices and climate variability (Kadigi et al., 2020). (Table 2).

Table 2: The production of rice by farmer members of community rice centers in Kamphaeng Phet, Thailand

Production of rice	Grade A (n=23)		Grade B (n=80)		Grade C (n=114)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Cost of cultivation (baht per rai)	7,269.13	461.63	6,729.03	1,061.53	5,817.72	933.25
The yield of paddy (kilogram per rai)	800.00	67.42	827.25	102.92	902.54	139.73
Price of rice production (baht per ton)	9,856.52	296.69	9,138.75	1087.62	8,083.33	525.44

Note: A rai = 0.16 hectares.

Management efficiency of Community Rice Center for rice seeds production in Kamphaeng Phet Province

The CRCs with extremely high potential (Grade A) had management efficiency for rice seed production. Overall, it was at an excellent level ($\bar{X} = 4.60$), and each aspect was at the same level as excellent, followed by the CRCs with high potential (Grade B). Overall, it was at an excellent level ($\bar{X} = 4.27$), and each aspect was at an excellent level, similar to the CRCs with extremely high potential (Grade A) but with a slightly lower average score. Regarding the CRCs with

moderate potential (Grade C), they had the least management scores for the CRCs. The overall level was good ($\bar{X}$ = 3.96). When considering each aspect, it was found that Planning ($\bar{X}$ = 3.60), Organizing ($\bar{X}$ = 3.98), Staffing ($\bar{X}$ = 4.30), Directing ($\bar{X}$ = 4.07), Coordinating ($\bar{X}$ = 3.97), Reporting ($\bar{X}$ = 3.77) and Budgeting ($\bar{X}$ = 3.99) respectively. Since, the management efficiency the CRCs with extremely high potential (Grade A) and the high potential community rice center (Grade B), where produce commercial rice seeds. In the planning aspect must to have a meeting to inform rice varieties/production dates for harvesting/production quantities and production standards before the production wet-season, plan to procure equipment/tools, financial plan to spend in the community rice center, marketing plan, plan to increase the distribution channels of rice seeds, and in the aspect of organizing, it was found that both the CRCs with extremely high potential (Grade A), and the high potential community rice centers (Grade B). The roles and responsibilities of the CRCs management committee are clearly defined, and notify to members were clearly defined. In terms of staffing, it was found that each community rice center potential was transparent in its work and could inspect the work of the community rice center management committee, and there is support in organizing a visit and training for members to develop knowledge and experience about increasing the efficiency of commercial rice seeds production, such as farming, reducing costs, managing rice fields, etc. In terms of directing, it was found that the extremely high potential of the CRCs (Grade A) and the high potential CRCs (Grade B) are encouraged to produce rice seeds that meet market needs, such as rice varieties and production standards. In terms of coordinating, it was found that the CRCs with moderate potential (Grade C) had slightly lower scores than the CRCs with extremely high potential (Grade A) and the CRCs with high potential (Grade B) because CRCs with moderate potential (Grade C) still have relatively little coordination with related agencies or officials, including networking with other community rice centers in nearby areas and networking with rice mills (purchasers) to contact and sell rice seeds of quite a few group members as well, With a high potential (Grade B) and moderate potential CRCs (Grade C) should be improved in the form of an annual report, and notify to members to find a risk management approach for CRCs and budgeting management is the best

important management. So, every the CRCs should be improved budgeting and debt efficient management and increase the efficiency of the management of CRCs for further rice seeds production (Table 2), which corresponds to Chongesiroj and Bunchapatanasakda (2019) used the POSDCoRB theory to integrate with farmers who studied about the level of opinions in the management of agricultural occupational groups in Chiang Rai Province, Thailand. Strengthen the group in the future (Table 2)

Table 3: Mean score and standard deviation level of farmer members' opinions towards the managing of the community rice center according to the potential of community rice centers

POSDCoRB theory	Grade A (n=23)		Grade B (n=114)		Grade C (n=80)		F-test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Planning	4.66	0.30	4.28	0.57	3.60	0.78	37.95*
Organizing	4.59	0.21	4.32	0.51	3.98	0.57	18.21*
Staffing	4.79	0.17	4.46	0.51	4.30	0.45	11.53*
Directing	4.60	0.25	4.31	0.50	4.07	0.42	16.89*
Coordinating	4.35	0.247	4.25	0.51	3.97	0.44	12.61*
Reporting	4.64	0.35	4.11	0.59	3.77	0.58	25.45*
Budgeting	4.56	0.30	4.17	0.65	3.99	0.70	7.64*
Overall	4.60	0.17	4.27	0.47	3.96	0.48	23.58*

Note: Opinion level toward community rice center management: mean 1.00-1.80 = urgently needs to be improving, mean 1.81-2.60 = needs to be improved, 2.61-3.40 = fair, 3.41-4.20 = good, 4.21-5.00 = excellent

*Statistically significant at the different levels of $P \leq 0.05$

Comparison of farmer members' opinions toward community rice center management classified by the potential of community rice centers

Comparison of opinions of the community rice center members on the management efficiency of the CRCs for commercial rice seeds production according to the potential of community rice center. Overall, the management efficiency of the CRCs was different. A statistical significance was at 0.05 ($F=23.58$) (Table 3). Each group of the CRCs was extremely high potential (Grade A), high potential (Grade B), and moderate potential (Grade C). Therefore, comparing each group of community rice centers by Sheffe's method (Table 4).

Table 4: Comparison of farmer members' opinions toward community rice center management according to the potential of community rice centers

	Sum of Squares	df	Mean Square	F	Sig.
Between Group	9.785	2	4.893	23.583	0.000
Within Group	44.395	214	0.207		
Total	54.180	216			

The results of the group comparison of the CRCs by Sheffe's method revealed that the CRCs members' opinions on the management efficiency of the CRCs for commercial rice seeds production, including the CRCs have extremely high potential (Grade A) with high potential community rice centers (Grade B), extremely high potential community rice centers (Grade A) with moderate potential community rice centers (Grade C), and high potential community rice centers (Grade B) with moderate potential community rice centers (Grade C) were different. Statistically significant at the 0.05 level.

Table 5: Comparison of each community rice center potential using Sheffe's method

The potential of the community rice centers		Mean difference	Std. Error	Sig.	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Grade A	Grade B	0.33*	0.108	0.011	4.52	4.67
	Grade C	0.64*	0.104	0.000	4.17	4.37
Grade B	Grade C	0.31*	0.066	0.000	3.87	4.05

Suggestions for improving the management efficiency of the community rice center for commercial rice seeds production from the president of the community rice centers

Management efficiency of the CRCs for commercial rice seeds production found that the different potential of the CRCs (Grade A, Grade B, and Grade C) had different levels of management efficiency in all aspects (Table 2). Therefore, each group of community rice centers should have a management approach appropriate to own potential. The president of the high potential community rice center (Grade B)

"He advised that human development should be prioritized, as elderly members may struggle to access expensive production technologies, even

though they are skilled in producing rice seeds resilient to climate change".

The same as a research result of Srisuantang, Traimongkolkul, and Pakpitcharean (2011) that rice farmers in Nakhon Pathom Province in Thailand had knowledge and expertise in rice production. However, additional technical knowledge and systematic management are needed to solve production problems and support efficient machinery suitable for local rice fields, and wherewith learning should be promoted by building farmers, farmer networks, and related agencies to lead to sustainable development and upgrade community rice centers to become models for the community. The president of the extremely high potential community rice center (Grade A),

"We were pleased with the Thai government's support for rice seeds production, such as rice transplanters, harvesters, and rice seeds drying machines, but cautioned that inconsistent management could become a burden for the community rice center. Thus, community rice centers should be managed efficiently to support technology or machinery development".

Furthermore, another president of the high-potential community rice center (Grade B),

"He suggested an approach to promoting community rice centers for commercial rice seeds production to the comprehensive community rice center can be managed themselves and not rely on selling seeds to rice mills".

This research result was consistent with Darwis et al. (2021) found that the strategies of Rice seed breeding business development should increase the availability of capital, improve the quality of seeds, develop marketing networks, and improve relationships with the government. Khanal and Maharjan (2015) that the development of strength of the market and the development of a marketing network are opportunities for rice seeds business development and economic goals. Moreover, having a network of seed production contributes to agricultural sustainability, seeds security, and the livelihoods of rural farmers, according to research by Arabiun. (2014); Thamthanakoon et al. (2022). Also, another president of the moderate potential community rice center (Grade C)

"He suggested creating a network between CRCs in Kamphaeng Phet Province to establish

interdependent rice centers with different skills and abilities, such as producing biological substances, finding channels to sell paddy to rice mills and distributing and selling rice seeds. Innovative public-private partnerships, organizing farmers into user groups, and enhancing training can aid in educating farmers and increasing the acceptance of technology necessary for commercial rice farming".

As suggested by Balasubramanian, et al. (2007). So, the main point of rice seeds production is distribution channels and systematic management to ensure sustainability. Moreover, Hakim, Juliaviani, and Faradilla (2022) research found that cash liquidity is essential for agricultural occupations and farming households. So, the guideline to development management efficiency needs to decrease limited cash liquidity to farmers can build high rice prices and opportunities to increase the value of their crops.

Conclusion

Developing management efficiency for community rice centers for commercial rice seeds production in Kamphaeng Phet Province, Thailand, requires a broad range of knowledge and integration of related agencies to ensure sustainable operation. The results of this study can serve as a guideline for enhancing management efficiency and creating sustainability for the community by tailoring the guidelines to the potential of each community rice center. The study found differences in all seven aspects of management efficiency, including planning, organizing, staffing, directing, coordinating, reporting, and budgeting. Specifically, the community rice center with moderate potential rice seeds centers (Grade C) needs to drive the planning aspect give to more management efficiency by should include meetings to inform members about rice varieties, production dates, harvesting, production quantities, and standards before the production season, procurement of equipment/ tools, financial planning for the community rice center, marketing plans, and plans to increase distribution channels for rice seeds and the reporting aspect should be improved to include a performance summary in the form of an annual report to notify to members, as well as manage the risk of community rice centers, and also the community rice center with high potential rice seeds centers (Grade B).

The Department of Rice and the Department of Agricultural Extension of the Ministry of Agriculture and Agricultural Cooperatives, Thailand, play a role in directly driving the policy of community rice centers. First, government agencies should be suggested support to members of community rice center about policy details be clarified to avoid burdening the community rice centers with unnecessary support. Second, the community rice centers require more management efficiency to develop community rice center able to comprehensive commercial rice seeds production that must be ready whole machine coupled with effective management, start focusing on human development, production and post-production technology, marketing, and sales as well as distribution channels that essential to manage community rice centers to decrease rely on only sales rice mills. Moreover, rice seed production by community rice centers is crucial to sustainable agricultural development and improving farmers' livelihoods in Thailand. (Figure 1)

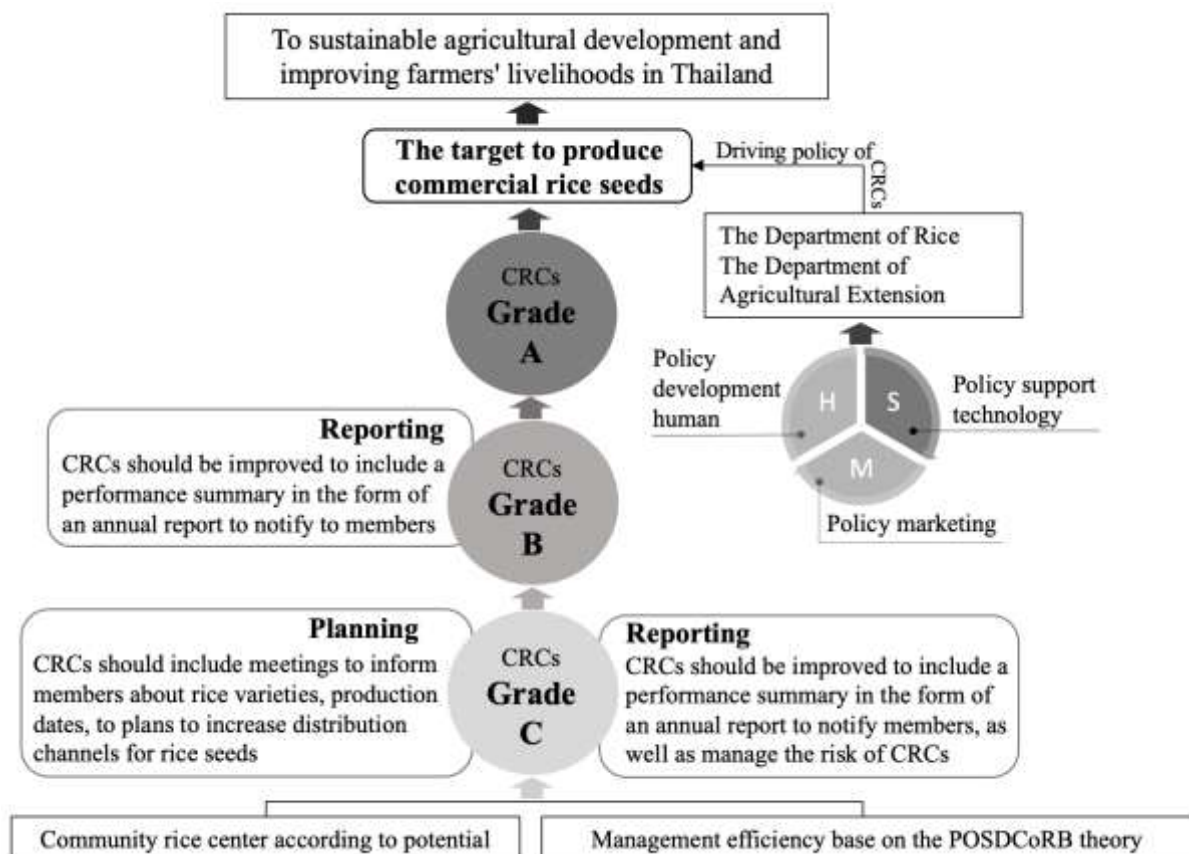


Figure 1: Guidelines for improving the management efficiency of community rice centers for commercial rice seeds production in Kamphaeng Phet Province

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