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Factors Influencing Members' Perceptions of Success in Agricultural Cooperatives in Cambodia: A Case Study in Tram Kak District, Takeo Province

Sereynithia Hun[1*] Hiroshi Isoda[2] Yuichiro Amekawa[2] Shoichi Ito[2]
1.Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Fukuoka, Japan
2.Faculty of Agriculture, Kyushu University, Fukuoka, Japan
* E-mail of the corresponding author: sereynithia@gmail.com

Abstract
Without members' satisfaction, agricultural cooperatives would not be successful or sustainable. This study aims to determine members' satisfaction regarding the degree of success in agricultural cooperatives and the relationship with members' socioeconomic factors. This study should contribute to identify appropriate policies for maintaining and improving agricultural cooperatives in Cambodia. The results show that providing more training could increase the perception of success regarding economic benefits, livestock technical improvements, and marketing information. Furthermore, providing rice bank services could increase the perception of success regarding economic benefits, livestock technical improvements, credit access, and satisfaction with services. Moreover, helping increase the paddy yield could result in greater satisfaction among members with the services provided.
Key words: agricultural cooperatives, perception of success, multiple linear regressions

1. Introduction

Agriculture plays an important role in the Cambodian economy (MAFF, 2015). In 2012, its share of gross domestic product (GDP) was 37%, and it employed approximately 67% of the total labor force, while the rural population was about 80% (FAO, 2014). To respond to the importance of agriculture, the Royal Government of Cambodia and the Ministry of Agriculture, Forestry, and Fisheries (MAFF) have introduced programs to support agricultural cooperative activities in Cambodia. This is aimed at rapidly increasing agricultural production, promoting crop diversification, creating income-generating activities through business development, and also exploring suitable markets for selling all kinds of agricultural products produced by cooperative members, as well as by the rural population as a whole (MAFF, 2008).

The Cambodian government started promoting the agricultural cooperative movement in 2003, and as a result, as many as 556 agricultural cooperatives were established between 2003 and 2014 (MAFF, 2015). However, some cooperatives have collapsed whereas others have not. Satisfaction by members is the key to ensuring the sustainability of agricultural cooperatives (Bhuyan, 2007). To sustain the development of agricultural cooperatives in Cambodia, members' satisfaction with the cooperatives needs to be ensured. Thus, studying the factors influencing the perception of success in agricultural cooperatives is critical to identify appropriate policies for maintaining and developing agricultural cooperatives in Cambodia.

This research has two objectives: 1) to determine members' satisfaction regarding the degree of success in agricultural cooperatives based on certain indicators, and 2) to identify factors influencing the members' perceptions of success of the agricultural cooperatives in the study area.

2. Data and research methodology

2.1 Data

This survey was conducted in September and October 2014 in Tram Kak District, Takeo province. Takeo province is located in the southern part of Cambodia and it is one of the most important rice producing provinces in the country. The annual paddy harvest in this province can feed one quarter of Cambodia (USAID, 2010). Takeo province has 10 districts and, based on data obtained from the Cambodian MAFF, Tram Kak District has the largest number of agricultural cooperatives in this province and a population of 181,258 (NCDD, 2010). In all, 242 members from 10 agricultural cooperatives in Tram Kak District were randomly selected and interviewed.

2.2 Research methodology

Members' satisfaction regarding the degree of success in agricultural cooperatives was studied using descriptive statistics. To attain this objective, 16 indicators were selected based on members' expectations of becoming members of agricultural cooperatives during a preliminary visit to the study areas. In this research, degree of success in agricultural cooperatives was rated on five-point Likert scale ranging from 0 to 4 (0 = least successful, 4 = most successful).

The relationship between degree of success and socioeconomic factors was explored using multiple linear regressions. Before undertaking the regressions, Principal Component Analysis (PCA) was used to reduce the number of variables (indicators of success). The model for the multiple linear regressions is as follows (Verbeek, 2013):

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots \beta_k x_{ik} + \varepsilon_i$$

where,

i : number of sample

k: number of independent variables

y_i: perception of success indicators (component score in PCA)

x_i: independent variables

ß: parameters to be estimated

ε : error terms

3. Results and discussion

3.1 Socioeconomic characteristics of households

On average, respondents were 47 years old, ranging from 22 to 81 years, with approximately 6 years of formal education. Moreover, they owned just over 1 ha of agricultural land on average, and their paddy yields were around 2,500 kg/ha. Also, 55% of the members responding had off-farm jobs, and 90% of them were aware that their agricultural cooperatives received support from non-governmental organizations (NGOs). Furthermore, 40% and 32% of them used rice bank and credit services respectively. Annually, members attended around 7 meetings and 1 training session. They received dividends in the amount of $7 approximately for the shares they owned, and their gross rice income was around $740.

3.2 Degree of success of agricultural cooperatives

Most of respondents perceived dividend from agricultural cooperatives, access to credit services, reduced loans from outsiders at high interest rates, conflicts no problem, satisfaction with services provided, access to marketing information, and access to technical support as the most successful indicators of the agricultural cooperatives. The results are shown in Table 2. A previous study also found that satisfaction with services of the cooperatives, access to information and marketing support, and access to extension service had positive effects to increase the membership of agricultural cooperatives (Debeb et al., 2016)

Table 3 shows the degree of success in agricultural cooperatives and the component loadings using selected indicators in PCA. It shows that members perceive agricultural cooperatives to be more successful with respect to dividends, access to credit services, reduced loans from outsiders at high interest rates, lack of conflict, satisfaction with the services provided, access to marketing information, and access to technical support. The number of indicators for the success of agricultural cooperatives is reduced using PCA. The results indicate that 5 components have eigenvalues greater than 1, and the total variance is 70.51%. The Kaiser–Meyer–Olkin (KMO) test for sampling adequacy is 0.70, indicating middling acceptance of the data for PCA (StataCorp, 2013).

According to loadings ≥ |0.4|, components 1 to 5 can be described as “economic benefits,” “livestock technical improvement,” “technical support and marketing information,” “credit access,” and “satisfaction with services and social relations.” Component 1, “economic benefit,” covers the indicator of “dividends from agricultural cooperatives.” Component 2, “livestock technical improvement,” covers indicators of “technical improvements in pig rearing,” “technical improvements in cow rearing,” and “technical improvements in poultry rearing.” Component 3 is “technical supports and marketing information,” which covers the indicators “access to marketing information” and “access to technical support.” Component 4, “credit access,” covers “access to credit services” and “reduced loans from outsiders at high interest rates.” Component 5, “satisfaction with services and social relations,” covers “conflicts no problem” and “satisfaction with services provided.”

3.3 Success of agricultural cooperatives in relation to socioeconomic factors

Relationships between success and socioeconomic factors were investigated using multiple linear regression models, the results of which are shown in Table 4.

For component 1, the results show that older and more educated members tend to perceive agricultural cooperatives as more successful based on the economic benefits. Members who attend more meetings and training sessions tend to perceive agricultural cooperatives as more successful on the basis of the opportunity to gain knowledge for their agricultural production, thus leading to the perception of attaining greater economic benefits. Members in receipt of dividends tend to feel that their cooperatives are successful in terms of providing economic benefits. Members accessing rice bank services view cooperatives’ success in terms of their ability to use the borrowed paddy for consumption and also for sale to obtain money to buy agricultural production inputs.

For component 2, the results show that older members tend to perceive agricultural cooperatives as less

successful in terms of their ability or willingness to adopt technical improvements regarding the rearing of livestock. Members who have off-farm jobs view them as less successful perhaps because they focus on their off-farm jobs to a greater extent than their livestock activities. Members who attend more meetings and training sessions tend to perceive cooperatives as more successful on the basis of opportunities to learn livestock techniques from meetings and training sessions. Members with access to rice bank services view cooperatives as more successful as they can use the borrowed paddy for animal feed, and they can also sell some borrowed paddy to obtain money to invest in livestock. Moreover, members who receive a higher gross income from rice are inclined to perceive cooperatives as more successful because they can use the income to invest in livestock.

For component 3, the results indicate that members who attend more training sessions tend to view cooperatives as more successful because of the opportunities such sessions provide to obtain technical support and marketing information. In contrast, members who attend more meetings tend to perceive cooperatives as less successful because they do not provide technical support or marketing information, thus pointing to their potential ineffectiveness. Members of cooperatives accessing credit services can invest more in agricultural production; however, they may not receive sufficient technical support or marketing information to fulfill their aims from agricultural cooperatives, but rather do so from vendors, middlemen, and other farmers. As a result, they view agricultural cooperatives as less successful regarding the provision technical support and marketing information. On the other hand, members with a higher gross income from rice consider cooperatives to be successful regarding technical support and marketing information.

For component 4, the results reveal that members who attend more meetings view cooperatives as more successful because information related to credit is disseminated during such meetings, thus giving them a greater understanding of potential lines of credit. On the other hand, members who attend more training sessions tended to perceive them as less successful in this regard. The reason for this is that when members join training sessions, they learn agricultural techniques and may therefore want to invest more in agriculture using the credit service offered by the cooperative. Unfortunately, the amount of credit for each member is limited. Members in receipt of more dividends, and access to credit services and rice banks tend to view the cooperatives as more successful.

For component 5, the results show that highly educated members always expect more from agricultural cooperatives; however, the services provided are limited, so they tend to perceive them as less successful. Members with higher paddy yields and those access rice bank services are likely to be satisfied with the services provided and social relations.

4. Conclusions and policy implications

The results of this research show that most members receive economic benefits from their agricultural cooperatives, in particular access to credit services and reduced loans from outsiders at high interest rates. Also, most members report being satisfied with the services provided. The 16 indicators of the success of agricultural cooperatives selected can be divided into 5 components: economic benefits, livestock technical improvement, technical support and marketing information, credit access, and satisfaction with services and social relations. Providing more training could increase the perception of success regarding economic benefits, technical improvements with regard to livestock, technical support, and marketing information. Furthermore, providing rice bank services could increase the perception of success regarding economic benefits, technical improvements for livestock, credit access, and satisfaction with services. In addition, helping to increase the paddy yield could result in greater satisfaction with the services provided.

Based on these results, some possible policy implications can be drawn to increase the perception of success of agricultural cooperatives, as well as to ensure their sustainability and development in Cambodia. First, agricultural cooperatives that do not provide rice bank services should do so, while those cooperatives currently providing this service should continue to do so. Moreover, based on the results for component 3, technical support and marketing information mechanisms for members should be strengthened to reduce their dependence on vendors, middlemen, and other farmers. In addition, the amount of credit for each member should be increased if possible, so that members can invest more in their agricultural production. Finally, as well as the provision of current services, it is very important to study and gain an understanding of the new requirements of members to enable agricultural cooperatives to meet their needs.

This research focuses on the success of agricultural cooperatives in Cambodia based on members' perception. More studies on impacts of membership in agricultural cooperatives on farming performances such as paddy yield, paddy revenue, livestock revenue, farm revenue and food security should be further studied in the future.

5. References

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Table 1: Description of independent variables used in multiple linear regression models

Variables	Description	Mean	Standard Deviation	Minimum	Maximum
AGE	Age (years)	46.87	11.79	22.00	81.00
GENDER	Gender (1=male, 0=otherwise)	0.80	0.40	0.00	1.00
EDU	Education (years)	5.66	2.93	0.00	12.00
YIELD	Paddy yield (kg/ha)	2,494.83	607.04	800.00	4,286.00
AGRILAND	Total agricultural land (ha)	1.09	0.70	0.15	5.00
OFFFARM	Off-farm job (1=yes, 0=otherwise)	0.55	0.50	0.00	1.00
MEETINGS	Number of meetings	6.49	4.75	0.00	24.00
TRAINING	Number of trainings	0.78	0.97	0.00	4.00
NGO	Awareness of NGO support (1=yes, 0=otherwise)	0.90	0.30	0.00	1.00
DIVIDEND	Dividend in U.S. dollars	7.02	13.30	0.00	99.01
RICEBANK	Rice bank use (1=yes, 0=otherwise)	0.40	0.49	0.00	1.00
CREDIT	Credit use (1=yes, 0=otherwise)	0.32	0.47	0.00	1.00
RINCOME	Gross rice income in U.S. dollars	739.34	558.82	94.06	4,727.72

Source: Self-survey, 2014
Notes: Sample size = 242

On average, respondents were 47 years old, ranging from 22 to 81 years, with approximately 6 years of formal education. Moreover, they owned just over 1 ha of agricultural land on average, and their paddy yields were around 2,500 kg/ha. Also, 55% of the members responding had off-farm jobs, and 90% of them were aware that their agricultural cooperatives received support from non-governmental organizations (NGOs). Furthermore, 40% and 32% of them used rice bank and credit services respectively. Annually, members attended around 7 meetings and 1 training session. They received dividends in the amount of $7 approximately for the shares they owned, and their gross rice income was around $740.

Table 2: Perceptions of success of agricultural cooperatives based on selected indicators

No.	Selected Indicators of Success	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)
1	Dividend from agricultural cooperatives	16.53	0.83	0.41	0.83	81.40
2	Reduced agricultural expenditure	31.82	4.55	8.26	35.95	19.42
3	Access to paddy rice for consumption when in need	38.02	4.13	4.55	2.48	50.83
4	Technical improvements in pig rearing	34.71	5.37	5.79	9.09	45.04
5	Technical improvements in cow rearing	31.40	3.72	5.37	4.55	54.96
6	Technical improvements in poultry rearing	27.27	2.89	3.72	4.13	61.98
7	Access to fertilizers and pesticides at lower prices	42.56	2.48	11.57	1.65	41.74
8	Access to animal feeds and medicines at lower prices	63.22	6.61	25.21	1.65	3.31
9	Better prices for agricultural products	39.67	2.48	13.64	11.57	32.64
10	Ease of selling products	29.34	1.65	11.16	2.48	55.37
11	Access to credit services	16.53	2.07	4.13	1.24	76.03
12	Reduced loans from outsiders at high interest rates	11.98	1.65	2.48	1.24	82.64
13	Conflicts no problem	4.96	1.65	0.83	1.24	91.32
14	Satisfaction with services provided	1.65	0.83	0.83	1.24	95.45
15	Access to marketing information	17.77	0.00	2.48	2.89	76.86
16	Access to technical support	19.83	0.00	0.83	1.65	77.69

Source: Self-survey, 2014
Note: Sample size = 242

Most of respondents perceived dividend from agricultural cooperatives, access to credit services, reduced loans from outsiders at high interest rates, conflicts no problem, satisfaction with services provided, access to marketing information, and access to technical support as the most successful indicators of the agricultural cooperatives.

Table 3: Degree of success and components identified using selected indicators in PCA

No.	Selected Indicators of Success	Mean	Standard deviation	Most Important Component				
				1	2	3	4	5
1	Dividend from agricultural cooperative	**3.30**	**1.50**	**0.47**	-0.13	-0.21	0.02	0.14
2	Reduced agricultural expenditure	2.07	1.57	0.35	0.06	-0.37	0.03	0.09
3	Access to paddy rice for consumption when in need	2.24	1.89	0.36	0.05	-0.09	-0.10	0.26
4	Technical improvements in pig rearing	2.24	1.81	-0.06	**0.54**	0.00	0.12	0.00
5	Technical improvements in cow rearing	2.48	1.82	-0.05	**0.57**	-0.01	0.08	0.00
6	Technical improvements in poultry rearing	2.71	1.78	0.08	**0.52**	-0.01	-0.21	-0.03
7	Access to fertilizers and pesticides at lower prices	1.98	1.85	0.37	0.10	0.15	-0.15	0.05
8	Access to animal feeds and medicines at lower prices	0.75	1.09	0.25	0.23	0.13	0.11	-0.03
9	Better prices for agricultural products	1.95	1.74	0.39	0.01	0.17	0.03	-0.27
10	Ease of selling products	2.53	1.78	0.38	-0.13	0.24	0.14	-0.26
11	Access to credit services	3.18	1.53	0.10	-0.01	-0.02	**0.66**	-0.09
12	Reduced loans from outsiders at high interest rates	3.41	1.36	-0.09	0.04	0.01	**0.65**	0.15
13	Conflicts no problem	3.72	0.96	0.00	-0.03	0.04	0.07	**0.63**
14	Satisfaction with services provided	3.88	0.61	0.05	0.01	0.11	-0.01	**0.56**
15	Access to marketing information	3.21	1.54	0.00	-0.01	**0.57**	-0.01	0.10
16	Access to technical support	3.17	1.60	0.02	0.01	**0.59**	-0.01	0.06
Eigenvalues				3.76	2.72	2.00	1.41	1.39
Cumulative percentage of variance explained (%)				23.51	40.48	52.98	61.80	70.51

Source: Self-survey, 2014

Table 3 shows the degree of success in agricultural cooperatives and the component loadings using selected indicators in PCA. It shows that members perceive agricultural cooperatives to be more successful with respect to dividends, access to credit services, reduced loans from outsiders at high interest rates, lack of conflict, satisfaction with the services provided, access to marketing information, and access to technical support. The number of indicators for the success of agricultural cooperatives is reduced using PCA. The results indicate that 5 components have eigenvalues greater than 1, and the total variance is 70.51%. The Kaiser–Meyer–Olkin (KMO) test for sampling adequacy is 0.70, indicating middling acceptance of the data for PCA (StataCorp, 2013).

Table 4: Factors influencing members' perception of success

	Component 1		Component 2		Component 3		Component 4		Component 5	
	Economic benefits from agricultural cooperatives		Livestock technical improvement		Technical supports and marketing information		Credit access		Satisfaction with services and social relation	
	Coeff.	P>|t|	Coeff.	P>|t|	Coeff.	P>|t|	Coeff.	P>|t|	Coeff.	P>|t|
AGE	0.018*	0.042	-0.019*	0.031	0.013	0.113	0.000	0.959	-0.007	0.347
GENDER	-0.150	0.531	0.311	0.202	0.226	0.311	-0.018	0.932	0.187	0.370
EDU	0.112**	0.003	-0.011	0.765	0.050	0.142	-0.015	0.642	-0.068*	0.034
YIELD	0.000	0.086	0.000	0.523	0.000	0.730	0.000	0.327	0.001**	0.003
AGRILAND	-0.040	0.896	-0.185	0.548	-0.028	0.920	-0.433	0.103	0.284	0.280
OFFFARM	0.182	0.361	-0.414*	0.042	0.234	0.208	0.082	0.640	0.146	0.399
MEETINGS	0.046*	0.038	0.065**	0.004	-0.047*	0.022	0.053**	0.007	-0.012	0.542
TRAININGS	0.505***	0.000	0.365***	0.000	0.412***	0.000	-0.198**	0.017	-0.025	0.757
NGO	0.021	0.947	0.073	0.826	-0.216	0.475	-0.492	0.085	0.474	0.094
DIVIDEND	0.018*	0.013	-0.001	0.943	0.001	0.827	0.013*	0.041	0.004	0.527
RICEBANK	1.642***	0.000	1.107***	0.000	-0.173	0.366	0.677***	0.000	0.646***	0.000
CREDIT	-0.230	0.282	0.396	0.068	-0.995***	0.000	0.454*	0.016	0.184	0.320
RINCOME	0.000	0.236	0.001*	0.027	0.001*	0.034	0.001	0.072	-0.001	0.086
_cons	-1.649	0.041	-0.536	0.511	-1.039	0.165	0.212	0.763	-1.314	0.060
R-sq	0.416		0.327		0.361		0.227		0.213	

Source: Self-survey, 2014

Note: *, **, *** significant at 5%, 1% and 0.1% respectively.