



## Evaluation of Organic Rice Contract Farming Model in Cambodia

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**Abstract** In Cambodia, organic farming under contract farming scheme is considered as one of the measures for better access to markets and poverty reduction since 2012. Previous literature revealed that organic rice farmers can generate more profit by engaging in contract farming. But only a few organic farming cases under contract farming succeeded. Since there was a lack of empirical study on current condition and issues of contract farming design and arrangement, this study clarified the effectiveness of organic rice contract farming arrangement and determined the most suitable contract farming model for small-scale farmers to maximize economic benefits. From a total of 5,053 organic rice contract farming households in Preah Vihear province, a total of 90 respondents were randomly selected. In the study area, two different organic rice contract farming models were found, namely intermediary model (Model A) and the multipartite model (Model B). Economic analysis approach revealed that even farmers in model A received a higher rice price than model B, but there were still model A farmers who did side-selling much more than model B farmers. Thus, third-party in model B seemed to play an essential role in contract farming to make proper arrangements as well as to balance the bargaining between farmers and contractors. In general, model B contract farming (also known as multi partite model) is recommended for organic rice farmers to maximize their economic benefits as well as profits.

**Keywords** contract farming model, organic rice, small-scale farmers.

### INTRODUCTION

In Cambodia, about 90% of the poor live in rural areas and rely on agriculture for their primary sources of livelihood (NIS, 2008). To promote and improve agricultural productivity and marketing access for agricultural products, the government has been promoting contract farming (CF) and organic farming to remove some constraints on agricultural growth and linkages to input and output markets. (MAFF Cambodia, 2012). However, the advantages of CF can only be achieved if contract arrangements are well managed and are mutually beneficial to both farmers and contractors. For CF overview, various forms of CFs have been practiced in Cambodia since 1950, mainly through informal arrangements. But this stopped during the civil war between 1975 and 1979 (Couturier, et al. 2006). Recently, there have been a few organic rice contract farming reintroduced though some contracts had already failed, and very few have succeed (Cai et al., 2008; Nou and Heng, 2013). According to Cai et al. (2008) and Nou and Heng (2013) found that serious managerial issues including remain, leasing to the poor management. As a result, farmers have often slipped out of the contract before the end of the contract period.

Preah Vihear province, located in northern Cambodia, is known as the largest area producing organic rice within contract farming. As shown in table 1, there are 32 Agriculture Cooperatives (ACs) with 5,053 total members. However, the actual sale was low in some years due to natural disasters and some problems in contract farming arrangements.

**Table 1 Organic rice contract farming in Preah Vihear Province**

Year	Agriculture Cooperatives (AC)	Member (HH)	Cultivated area(ha)	Estimate-Production in Contract (tons) (a)	Actual sale	
					Tons (b)	Percentage (b)/(a)
2014	8	891	2,293	1,800	1,466	81
2015	12	1,669	4,185	8,666	2,790	32
2016	25	3,151	8,703	13,795	11,476	83
2017	32	5,162	15,812	26,538	13,984	53
2018	32	5,053	16,052	26,786	1,555	43

Source: Provincial Agriculture Department, 2019

For this study, CF is defined as arrangements where farmers are the ones who provide land, labor, and capital; and contractors provide technical supports, requirement supports, and market to farmers.

### Modalities of Contract Farming and Types of Contracts

According to FAO (2001) there are five contract farming models. 1) Centralized: an agribusiness company buys produce from many small-scale farmers with tight control over quality and quantity. 2) Nucleus estate: an agribusiness company combines CF with direct involvement in plantation production. 3) Multipartite: farmers sign contracts in a joint venture established between an agribusiness company and a local entity. 4) Intermediary: an agribusiness company may have contracts with intermediaries who then sign contracts with a larger number of farmers. 5) Informal: more informal verbal purchase agreements are signed on a seasonal basis, with inputs provided by the company often being restricted to seed and fertilizer.

### OBJECTIVE

This study aims to understand the effectiveness of organic rice contract farming (ORCF) arrangement and determine which contract farming model is the most suitable for small-scale farmers with respect to maximizing benefit and farm incomes. Specifically, this study aims to:

1. identify the ORCF models by small-scale farmers in the study area;
2. determine the effectiveness of each contract farming model on small-scale farmers livelihood in term of income generated, and productivity; and
3. evaluate the difference ORCF models with focus on benefit and contract enforcement.

### METHODOLOGY

In this study, both primary and second data were collected. A total of 90 respondents were randomly selected from 5,053 organic rice contract farming households within 2 different ORCF models in Preah Vihear Province. Contractors, agricultural officers, NGOs, and union of agricultural cooperative were interviewed using questionnaire forms and groups discussions. Descriptive and profitability analyses were utilized.

### RESULTS AND DISCUSSION

#### Organic Rice Contract Farming Models' Characteristic

From field observation, in the study area, there are two different organic rice contract farming models were identified as follows.

**Intermediary model (Model A):** Farmers and contractors are directly engaged to each other; farmers who provide land, labors, and capital; and contractors provide technological supports, requirement supports, and market.

**Multipartite model (Model B):** Union agriculture cooperative links farmers to contractors and technical support; there is support from NGOs to union and farmers; farmers who provide land, labor, and capital and pay for union operation; and contractors provide markets.

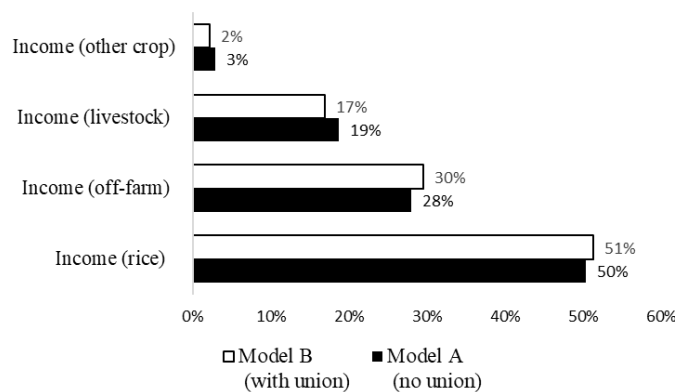
**Table 2 Arrangement of contract farming models**

Categories	Model A	Model B
Farmers	Certified and cooperative agriculture (AC) member	Certified and cooperative member in Union of AC
Contract formulas	Based on market specifications	Based on market specifications
Contract format	Legally formal agreement	Legally formal agreement
Crop schedule	Yes	Yes
Pricing policies	Fixed before harvesting 1-3 weeks by contractors	Fixed before harvesting 1-3 weeks by contractors and Union
Technical assistance	Sometimes	Yes
Loan	No	Yes
Input provision	Limited	Limited
Training provision	Sometimes	Frequently
Communication	Through cooperative	Through union cooperative
Monitoring	Sometimes	Sometimes
Cost of operation	AC	Union + AC

Source: Field survey, 2019

All farmers in both models are certified by the same certification institute. Contract farming agreement, crop schedule, technical assistance, and input provision are similar in both contract farming models. However, contract farming model A did not provide loans to ACs or farmers, while ACs in model B could get loans from union agriculture cooperative. In addition, farmers in model B could get more support than farmers in model A. For example, union agriculture cooperatives are with farmers and contractors to set up price of organic rice. However, farmers in model B must pay the union 30 riels/kg of their organic rice production and another 30 riels/kg as AC operation cost while farmers in model A need to pay 30 riels/kg only as AC operation cost. Overall, all those support and arrangements affected farmers’ productivity, as well as profits.

**Organic Rice Farmers’ Characteristic in Both Contract Farming Models**



**Fig. 1 Income source of farmers in both models**

Source: Field survey, 2019

Farmers in both models depend on organic rice cultivation as main income; this is about 50% of total income, followed by off-farm income such as wages, construction name as a few, and livestock breeding on their farms. Beside rice farming, farmers in both models produce other crops such as cassava and cashew nuts. In addition, all farmers could grow organic rice once a year, and most of the farmers do long maturity rice rather than medium maturity. Recently, direct-seeding method is the common practice in organic rice cultivation in the study area while transplanting method is decreasing.

**Table 3 Organic rice contract farmers' characteristic**

Items	Model A	Model B	A-B	T-Stat	
Number of Household (HH)	45	45			
Family size (person)	4.36	4.76	(0.40)	(1.36)	*
Age (years)	44.29	40.22	4.07	1.80	**
Farming experiences (years)	25.16	21.80	3.36	1.46	*
Education (years)	6.22	4.49	1.73	2.65	**
Planted rice land size (ha)	4.25	3.44	0.81	1.86	**
Income (rice) per HH	8,671,311	8,608,900	62,411	0.07	
Income (rice) per ha (riels/year)	2,101,846	2,611,896	(510,050)	(4.28)	*

Source: Field survey, 2019, Note: \*Signification at level 0.06 to 0.10 \*\*Signification at level less than 0.05

Farmers in model A are 4 years older and use 0.81ha of rice cultivation land more than farmers in model B. Moreover, income from organic rice per HH are very similar in both models, but income from organic rice per ha in model B is higher than farmers in model A meaning there are some differences in each productivity.

### Profitability of Organic Rice Farming in Both Models

**Table 4 Total production cost of organic rice production**

Items	Model A				Model B				Unit: '000 riels /ha
	Direct seeding		Transplanting		Direct seeding		Transplanting		
	Medium	Late	Medium	Late	Medium	Late	Medium	Late	
Variable cost	485.1	515.7	282.9	258.1	569.7	515.2	587.1	353.9	
Fuel consumption of									
Land preparation	55.9	53.5	56.0	54.3	57.8	57.9	58.7	58.6	
Transportation	18.1	18.0	19.6	18.8	18.5	18.0	20.7	20.0	
Seed	303.8	197.5	126.0	105.0	305.8	179.4	139.8	113.8	
Threshing	70.0	64.1	81.3	80.0	83.9	75.2	105.1	105.3	
Combine harvester	37.3	182.6	-	-	103.7	184.6	262.7	56.3	
Fixed cost	259.2	288.2	259.2	296.4	254.9	273.2	246.9	274.6	
Total labor cost	600.1	532.0	983.5	966.6	511.6	457.1	665.1	850.0	
Family labor	234.0	224.7	356.8	343.3	217.5	213.1	206.6	350.0	
Hired labors	292.1	237.9	506.7	570.0	208.2	153.9	251.2	287.5	
Exchange labors	74.0	69.4	120.0	53.3	85.9	90.0	207.3	212.5	
Total production cost	1,344.4	1,335.9	1,525.6	1,521.1	1,336.2	1,245.4	1,499.1	1,478.5	

Source: Field survey, 2019, Note: Labors cost is 20,000 riels per 8 hours per person. 4050 riels = 1USD (2019/10/01)

As shown in Table 4, farmers in model A spent more on labor cost due to a lower use of combine harvester services while farmers in model B received more support from the union including combine services during harvesting. Overall, farmers in model B spent less in production cost than farmers in model A. Moreover, family labor and exchange labor are considered as noncash cost because farmers did not pay in cash. However, farmers in model B still use more exchange labor than farmers in model A; this affected the cash income in both models. The study found that when there were differences in cash incomes, farmers' decisions were also different.

In Table 5, all organic rice prices were already deducted from the cost of union and AC. Therefore, contract farming model A provided higher price of rice than model B but yield in contract farming model B was a higher in each category. From field observation, farmers in model B used combine harvester services during harvesting that could keep the high volume and quality of rice (preventing grain loss), while almost farmers in model A had done the harvesting by hand. Therefore, farmers in model B could generate more profit than farmers in model A, especially on cash income. In addition, medium rice maturity usually could provide higher yield but during that time, there was drought in the middle of the cultivation season which affected the yield of medium maturity. After all, farmers in model B could generate more profit and cash income than farmers in model A even though farmers in model A got higher price.

**Table 5 Total profitability of organic rice production in both contract farming models**

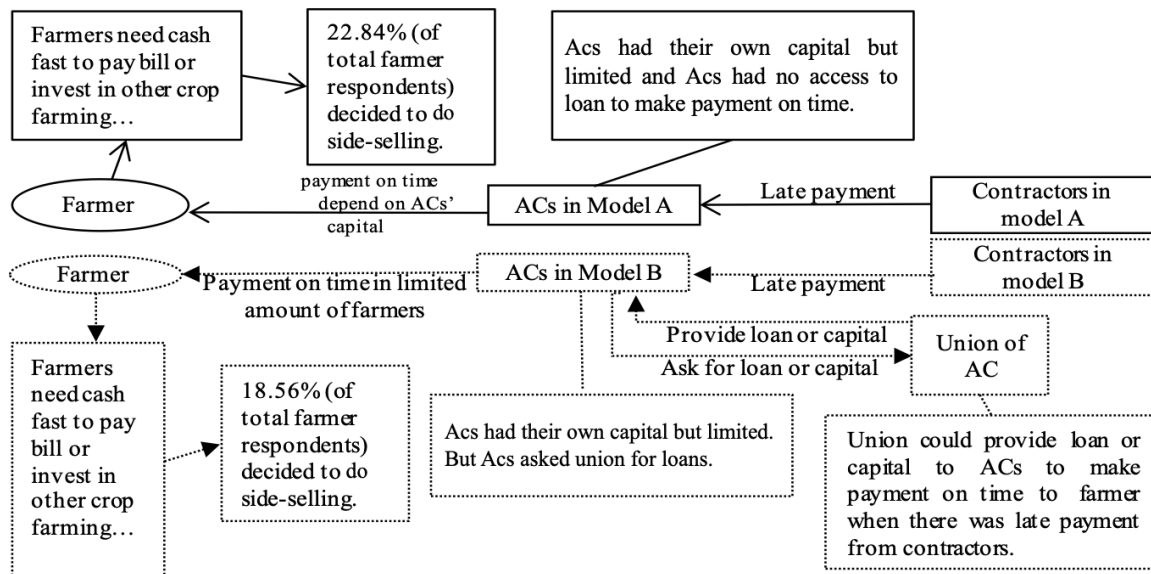
Items	Model A				Model B			
	Direct seeding		Transplanting		Direct seeding		Transplanting	
	Medium	Late	Medium	Late	Medium	Late	Medium	Late
Yield (Tons/ha)	<b>1.74</b>	<b>1.64</b>	<b>2.05</b>	<b>2.00</b>	<b>1.96</b>	<b>1.87</b>	<b>2.30</b>	<b>2.15</b>
Price (Riels/kg)	1,407	1,117	1,510	1,130	1,384	1,087	1,405	1,108
A. Gross revenues	<b>2,448.6</b>	<b>1,831.9</b>	<b>3,095.5</b>	<b>2,260.0</b>	<b>2,712.7</b>	<b>2,027.7</b>	<b>3,231.5</b>	<b>2,382.2</b>
a. Total Variable cost	485.1	515.7	282.9	258.1	569.7	515.2	587.1	353.9
b. Total Fixed cost	259.2	288.2	259.2	296.4	254.9	273.2	246.9	274.6
c. Total Labor cost	600.1	532.0	983.5	966.6	511.6	457.1	665.1	850.0
B. Total noncash cost	308.0	294.1	476.8	396.6	303.4	303.2	413.9	562.5
C. Total Production cost (a+b+c)	1,344.4	1,335.9	1,525.6	1,521.1	1,336.2	1,245.4	1,499.1	1,478.5
D. Total Cash income (A-C+B)	1,412.2	790.1	2,046.7	1,135.5	1,679.9	1,085.4	2,146.3	1,466.2
E. Total profit (A-C)	<b>1,104.2</b>	<b>496.0</b>	<b>1,569.9</b>	<b>738.9</b>	<b>1,376.5</b>	<b>782.2</b>	<b>1,732.4</b>	<b>903.7</b>

Unit: '000 riels/ha  
 Source: Field survey, 2019, Noted: 4050 riels= 1 USD (2019/10/01)

**Key Challenges and Main Concern in Both Organic Rice Contract Farming Models**

From field observation in 2019, contractors in both contract farming models made late payment to farmers which caused some problems in contract farming arrangement such as side-selling. Side selling referred to farmers who sold some or all their contracted productions to other sellers beside the contractors. Since those farmers immediately needed cash in hand, they decided to do side selling. Therefore, farmers who did the side selling received lower unit price compared to unit price in contract farming. In addition, there were about 22.84% of farmer respondents in model A who did side-selling while model B had about 18.56%.

As shown in Fig.2, farmers in model B did side selling less than farmers in model A because farmers in ACs in model B could get some loans from union to make the payments on time instead of the late payment from contractors, while ACs in model A used their own capital to make payments on time. So, it seems that union in model B has played an important role to keep good contract arrangement.



**Fig. 2 Reasons of farmers did side selling in both contract Farming models**

Source: Author's compilation based on field survey, 2019

Table 6 showed that farmers in model A had more concerns than farmers in model B in each category because farmers in model A did not have any third party (e.g. union) to balance the power of contractors and farmers as well as good arrangement. However, both contract farming model

farmers still have concerns; thus, both contract farming models need to improve those conditions. Moreover, farmers in model B also complained about the high interest rates from the union and operation costs. In addition, poor infrastructure leads to higher spending on production cost of farmers and union operation.

**Table 6 General benefits and concern in both contract farming models**

Categories	Model A	%	Model B	%	Total	%
N	45	100	45	100	90	100
Concerns						
Limited access to credit	31	69	15	33	46	51
Price bargain	31	69	20	44	51	57
Noncompliance	33	73	26	58	59	66
Poor infrastructure	37	82	38	84	75	83

Source: Field survey, 2019

## CONCLUSION

Two different organic rice contract farming models were found in the study area, namely the intermediary model (Model A) and the multi-partite model (Model B). Model B farmers paid more on third-party (union) operation and resulted in more support (e.g. training, loan) than model A farmers. As results, model A farmers could get a higher price of organic rice than model B farmers. However, with the current situation, that of having support from the union which allowed model B farmers to generate more profit and cash income than farmers in model A. Moreover, there were still model A farmers who did side-selling more than model B farmers. Thus, union in model B seemed to play an essential role in contract farming to make proper arrangements while ensuring the farmers' profits and balancing the power of farmers and contractors. Overall, with the current condition, contract farming model B (also known as multi-partite model) is recommended for organic rice farmers to maximize their economic benefits and profits.

Part of the limitations of this study was time constraint. Thus, further study should focus on the key challenges in contract farming relationship within the supply chain in order to propose and critically evaluate options for improving contract farming conditions for organic rice farmers and introducing more efficient and sustainable contract design based on all actors in contract farming using both qualitative and quantitative approaches.

## REFERENCES

- Cai, J., Luyna, U., Sununtar, S. and Ping, S. 2008. Rice contract farming in Cambodia: Empowering farmers to move beyond the contract toward independence. ADBI Working Papers, 109, Asian Development Bank Institute, Tokyo.
- Couturier, J., Savun, S. and Ham, P. 2006. Inventory of farmer organizations in Cambodia. MAFF and Ministry of Foreign Affairs of France, Phnom Penh.
- MAFF Cambodia. 2012. Policy document on promotion of paddy rice production and export of milled rice. Ministry of Agriculture Forestry and Fisheries, Phnom Penh.
- NIS Cambodia. 2008. Cambodian census. National Institute of Statistic (NIS), Phnom Penh.
- Nou, K. and Heng, M. 2013. Emerging contract farming: A case of high quality rice in Cambodia. Phnom Penh, Cambodia.
- Provincial Department of Agriculture. 2019. Preah Vihear province annual report of contract farming 2019. Preah Vihear Provincial Department of Agriculture, Ministry of Agriculture, Forestry and Fisheries, 6, Cambodia.