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The Effect of Rice Contract Farming on Smallholder Farmers' Incomes
in Cambodia: A Case Study in Toul Sala Commune in
Barsedth District, Kampong Spue Province

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December, 2013

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Abstract

Recent research on the controversial topic of contract farming indicate that contract farming may be considered as an effective risk management system for smallholder farmers, enhancing their accessibility to farm inputs, ensuring the more stable prices for produce, and ultimately generating higher incomes to contract farmers. Similarly, even with very few studies of contract farming being carried out in Cambodia, the result show that contract farmers can generate higher incomes when bounding in the contract. However, the numbers of rice contract farmers have increasingly exited from the contract in the last five years. If contract farming agreement generates higher incomes to contract farmers, why do they exit from the contract? This study aims to assess whether contract farming improve smallholder farmers' incomes and the challenges these farmers face. The study puts forth a set of recommendations on how to improve the rice contract farming model in Cambodia.

The study combines both quantitative and qualitative data sources and includes a comprehensive literature review and information obtained from interviews with concerned individuals through one-on-one sessions, focus group discussions and household surveys. Results of the contract farming studies in Southeast Asia showed that it is not a group or individual, the oral or written contract per se which structure the outcome, but rather how it is practiced in a given context. In Cambodia, the rice contract farming arrangement has been operated through both verbal and written agreements with NGOs and private companies, respectively. There was significant different in the mean of gross incomes between rice contract and non-contract farmers. Rice contract farmers have exited from the contract on the one hand regarding two main factors that include the payment which is not according to the predetermine schedule and the using of quality control against farmers. On the other hand, the rice contract farmers have exited from the contract, perhaps, because of no significant difference between engaging and not engaging in the contract. The exiting contract arrangements need to be improved and adherence to the contract guidelines from parties involve need to be enhanced. The study recommended the arrangement of contract farming should involve three parties that include the contractor, smallholder farmers, and local authority. The contract farming arrangement should be simple and easy to understand, the contract should encourage mutual trust and respect from both parties, the contract should be

flexible and negotiable, the contract should clearly state the responsibilities of both parties, and the payment should be made to farmers when the produce is delivered/received.

1. Introduction

Traditionally, agricultural rice cultivation in Cambodia has been dominated by smallholder farmers, a majority of which hold only very small plots of land (2008). How can these rice farmers survive by cultivating such tiny pieces of land? Increasingly, many scholars portray contract farming as a risk management system for helping smallholder farmers achieve better incomes through enhancing accessibility to inputs and ensuring the price of produce at harvesting season (Asian Development Bank (ADB), 2005; Bijman, 2008; Eaton & Sheperd, 2001; Fernando, 2006; Glover, 1984; Kanokwan et al., 2011; Key & Runsten, 1999; Masakure & Henson, 2005). However, in recent years, much debate has arisen regarding whether or not contract farming has yielded benefits to smallholder farmers in the face of theoretical and empirical evidence (Arunkumar, 2002; Key & Runsten, 1999; Narayanaswamy, 2006; Nham, 2012; P, Winters, & Patrick, 2005; Pari, 2000). However, very few of these studies have looked specifically at rice crops. As rice occupies more than 80% of cultivated land and provides more than three quarters of daily energy intake for the average Cambodian, this is a serious oversight.

1.1 Research Rationale

Traditionally, the smallholder farmers in Cambodia were challenged with using sufficient inputs and securing the price of produce. In an attempt to address these issues; smallholder farmers have been encouraged to cultivate their rice under the contract farming arrangement. Contract farming arrangement has been operated by a private company in 1999 and an NGO in 2004. Initially, the private company engaged smallholder farmers of around 100 households in one province in the contract arrangement. In 2005, the numbers of rice contract farmer increased to more than 40,000 households over 4 provinces. However, this figure decreased dramatically in 2012. Similarly, 2,000 household in seven provinces were engaged by NGOs to farm in contract farming in 2004. This also decreased and shrank to less than 800 households over four provinces in 2012. Empirical studies on rice contract farming in Cambodia could hardly be found. Up until now, there are only three research studies that have been conducted. Although the conclusion from these studies showed that rice contract farmers have higher incomes than rice non-contract farmers, the number of rice contract farmers who have exited from the contract has not yet been determined. If contract farming

arrangement is likely to be better off for rice contract farmers, why do they exit from the contract? To answer this general research question, three specific questions were asked. (1) What is the effect of rice contract farming on smallholder farmers' incomes? (2) What are the associated challenges that smallholder farmers under contract face? (3) How can rice contract farming be best suitable for smallholder farmers in the context of Cambodia?

1.2 Research Objectives

The general objective of this study is to examine the effect of rice contract farming on smallholder farmers' incomes in Cambodia.

The specific objectives of this study are:

1. To examine the effect of rice contract farming on smallholder farmer's income
2. To assess whether contract farming improves smallholder farmers' income
3. To identify the associated challenges that smallholder farmers under contract face
4. To recommend rice contract farming model for smallholder farmers in Cambodia.

1.3 Scope and Limitations

The study focused on the impact of rice contract farming on smallholder farmers in Toul Sala Commune in Barsedth District, Kampong Speu Province. Due to limited time, this study was conducted in only one village engaged in rice contract farming. Hence, results cannot be generalized for Kampong Speu Province and Cambodia as a whole.

2. Review of Literature

2.1 Definition of Contract Farming

Contract farming can be defined as an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices (Eaton & Sheperd, 2001). The arrangement also invariably involves the purchaser in providing a degree of production support through, for example, the supply of inputs and the provision of technical advice (Glover, 1984). The basis of such arrangements is a commitment on the part of the farmer to provide a specific

commodity in quantities and at quality standards determined by the purchaser and a commitment on the part of the company to support the farmer's production and to purchase the commodity.

2.2 Typologies of Contract Farming

Contract farming can take different formats and types. Some researchers classify contract farming into three kinds of contracts, namely "market specification", "resource providing" and "production management" (Bijman, 2008; Da Silva, 2005; Eaton & Sheperd, 2001; Minot, 1986). In the first modality, the transaction between growers and buyers is agreed on terms of *what* to be produced (product and quality attributes) and *what* are the commitments for future sale (timing, location and price). The second modality adds the provision of farming inputs to the former contract type. Beyond specifying production type and marketing condition, in-kind credit is offered via the provision of key inputs, often with cost recovery upon farm product delivery. Finally, under production management contracts, growers agree to follow precise technological guidance on *how* to produce. Regardless of the typology, the general term "contract farming" refers to a particular form of supply chain governance adopted by firms to secure access to agricultural products, raw materials and supplies meeting desired quality, quantity, and location and timing specifications. In this context, contract farming is seen as one of the alternative forms of vertical coordination in which firms can engage, which may also include spot markets, full vertical integration and different forms of vertical alliances.

2.3 Empirical Studies of Contract Farming in Southeast Asia Countries

Regarding the empirical studies on the impact of rice contract farming in Southeast Asia that can be downloaded for review, it is hard to generate a single conclusion of the impact of rice contract farming on smallholder farmers. The investigation on the impacts of rice contract farming on smallholder farmers in Southeast Asia is difficult due to a shortage of empirical studies. However, most empirical studies were found in Lao PDR, Thailand, Cambodia, and the Philippines while very few were found in Myanmar, Vietnam and Indonesia. No empirical studies were found in Singapore, Brunei, and East Timor as these countries are not agricultural oriented countries. Results showed that the impacts of rice contract farming on smallholder farmers in Southeast Asia varied across countries, depending on nature of the

contract, geographical location, and socio-economic condition of those farmers. However, most of them showed that rice contract farmers tended to have higher productivity, income, and profitability than their non-contract counterparts. This is due to the farmers can sell their rice yields at premium prices and expensed lower input costs. Although rice contract farming could increase workloads, it is neutral regarding social cohesiveness and positive on quality of soil. The summary of empirical studies on the impact of contract rice farming on smallholder farmers in Southeast Asia is shown in table 1.

Table 1. The impact of contract rice farming on smallholder farmers in Southeast Asia

Countries	Economic Impacts	Social Impacts	Environmental Impacts
Cambodia			
(Men et al., 2013)	-Increase profit per hectare by 1.4 time in the last 5 years	-Increase workload, but not influence social cohesiveness	-Improve soil quality
(Koji, 2009)	-Increasing productivity	-Increase social interaction	
(Cai, et al., 2008)	-Contract farmers earn higher average profit than non-contract farmers		
Thailand			
(Sali, 2012)	-Generate higher incomes	-Increase confidence in farming -Better health	-Enhance soil quality due to the decrease of chemical inputs
(Pornpratansom bat, Bauer, & Boland, 2011)	-Decrease production -Able to sell produce at premium prices		
(Sununtar, Pingsun, &	-Increase efficiency and profitability		

Countries	Economic Impacts	Social Impacts	Environmental Impacts
Junning, 2006)			
(Songsak & Aree, 2005)	-Increase productivity	-Accumulate skill in production and management	
		-Improve bargaining power	
Lao PDR			
(Gustaf, 2011)	-Increase productivity		
	-Able to sell produce at higher price of 42% from conventional rice		
	-Generate higher profit		
(John, 2011)	-Increase yields from 30-50%		
	-Able to sell produces at premium prices		
(Sununtar, Pingsun, & Adam, 2008)	-Increase productivity		
	-Able to sell produce at premium price		
	-Use lower input costs		
(Setboonsarng, et al., 2008)	-Earn higher profits		
	-Increase incomes		
(Sununtar, et al., 2008)	-Increase yields by	-Increase knowledge	-Improve rice quality by 10%

Countries	Economic Impacts	Social Impacts	Environmental Impacts
	30%	and experiences	
	-Increase incomes by 60%	-Better negotiation and decision making	
Myanmar			
(David, Tom, & Wilkinson, 2009)	-Increase productivity	-Greater use of labor	
(Ian, 2004)	-Use less capital		
	-Earn higher incomes		
	-Use lower input costs		
Vietnam			
(Nham, 2012)	-Increase yields by 20%	-Increase social network through training meeting	
	-Earn higher incomes		
(Hai, 2006)	-Better benefits		
Philippines			
(Robert, 2011)	-Increase yield by 0.5 metric ton per hectare	-Receive fund for irrigation restoration	
	-Increase earning of P4,400		
(Elbert, Ma, & Agustin, 2009)	-Increase gross incomes		
	-Experience higher profitability		
Indonesia			
(Phil, Paul, & Ian, 2005)	-Low productivity	-Secure market access	

Countries	Economic Impacts	Social Impacts	Environmental Impacts
		-Benefit in risk management	
Singapore	-	-	-
Malaysia	-	-	-
Brunei	-	-	-
East Timor	-	-	-

2.4 Challenges of Contract Farming

For smallholder farmers, the major challenges they would encounter in contract farming were irregular payments and low contract price, unawareness of potentiality of crops, poor technical assistance, manipulation of norms by firms and higher rejection rates (Arunkumar, 2002; Da Silva, 2005), incidence of pest and diseases (Kattimani et al., 2003) and a complex price system. Da Silva (2005) showed that the complex price determination mechanisms are mostly not understood by the smallholder farmers and this leads to the affect on farmer's benefits from contract farming. This price determination then becomes susceptible to manipulation and fraud. For instance, the contract farming cases in Vietnam, the contracting firm used complex technical standards and reduced the price to be paid to the farmers. When farmers receive inputs or technological assistance from the contracting firms, their dependency on inputs or technology makes them vulnerable to manipulation of productivity. Another challenge is smallholder farmers can become increasingly dependent on the contractor and can easily fall into indebtedness. As the engagement in contract farming implies easier access to credit through input provision, the risk of indebtedness for farmers increase. The behavior of smallholder farmers tends toward easy finance consumption and other non-productive needs with credit when accessing to credits is made easier by contracting firms, and thereby accumulating debt (ADB 2005). Similarly, Bijman (2008) also supported that this dependency could weaken the farmer's bargaining power and in turn increase the possibility for monopolistic buying behavior of the contracting firm. The contract would drive smallholder farmers to loose of flexibility. Farmers can then no longer choose another firm while the contract is still in effect or choose another crop to produce.

Therefore, farmers could not capitalize on market opportunities and lose potential income. Moreover, the losses off business relationships were a major threat to farmers in contract farming. Before engaging in contract farming, the farmer could have established long-term business relations with others, but when engaging in contract farming, these linkages were lost, and could be relatively difficult to rebuild after exiting the contract. For contracting firms, they were challenged with land constraints and fixing of contract price (Arunkumar, 2002). The contract farmers might try to put lower grade produce into higher grade and it was difficult to check and make sure of the grade as the quantity handled surely fall under desired category from the companies. In many cases, the contract farmers held up vehicles in the villages demanding that they should be paid higher prices even though agreement does not say so. Moreover, smallholder farmers tend to divert the produce to the open market rather than supplying to the processing firm when the prices were high which challenges the contracting firm with sufficient quantity requirement (Shiva 2002).

3. Research Methodology

3.1 Selection of Study Site

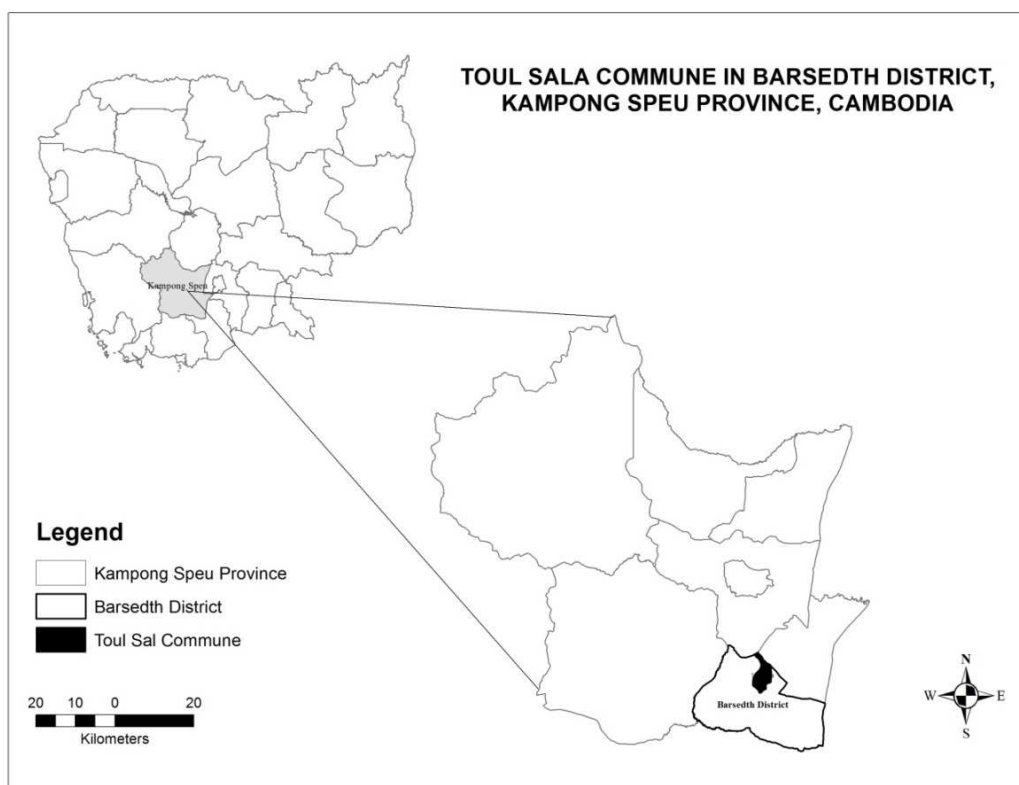


Figure 1. Map of Toul Sala Commune in Barsedth District, Kampong Speu Province

Toul Sala Commune in Barsedth District in Kampong Speu Province was selected for conducting household surveys, focus group discussion, and key informant interviews (Figure.1). The criterion for selection of this site is based on where the rice contract farming is being commonly practiced. The farmers in this commune have been operating on contract farming arrangement with two contracting firms and an NGO in producing organic rice. This characteristic enables the study to understand the contractual arrangement and its challenges derived from these two different contracting firms.

3.2 Data Collection and Analysis

The study combined both quantitative and qualitative data sources and includes a comprehensive literature review and information obtained from interviews with concerned individuals through one-on-one session, focus group discussions and household surveys. (Table 2). A literature reviews was conducted to identify the impact of rice contract farming on smallholder farmers regarding economic, social, and environmental aspects in Southeast Asian countries. Six key informant interviews and four focus group discussions were conducted to determine the contractual arrangement of rice contract farming being practiced and associate challenges, and to gather opinions on how to make the contract best suitable for smallholder farmers in Cambodia. Guide questions were used and responses were recorded and later transcribed. The survey was initially planned for 148 households, but only 136 households were surveyed as 12 households were not at home during the survey period. The interviews were conducted face to face with a checklist questions. The collected data were cleaned, coded, and entered into Excel spreadsheets which were later imported into SPSS spreadsheets where simple statistical analysis (percentages and independent sample mean t-test) were done. The sample size is shown in Table 2.

Table 2. Sample Size

Data Collection Method	Sample Size
Key Informant Interview	06 (02 from NGOs, 02 from private company, 01 Village Chief, 01 Commune Council)
Focus Group Discussion	04 (02 groups from rice contract farmers and 02 groups from rice non-rice contract farmers)

Data Collection Method	Sample Size
Household Survey	136 households (64 rice contract farmers and 72 non-rice contract farmers)

4. Results and Discussion

4.1 Household Characteristic

According to the Table 3 of the summary of sample household characteristic, the male household head of rice contract farmers and non-contract farmers were 82.8% and 65.3%, respectively. This percentage showed that the decision to engage in rice contract farming is more correlated with male household heads since the latter seem to have better access than female household heads to first-hand information, social connections and interactions. The average mean age of male household head was 49.82 years old for rice contract farmers and 47.96 years old for rice non-contract farmers. The average mean age of female household was 46.36 years old for rice contract farmers and 45.45 years old for non-rice contract farmers.

The educational attainment level of household of rice contract and non-contract farmers was low, which 18.8% and 31.9 % of them were respectively illiterate. Majority of them had studied in level of primary school, 53.1% for rice contract farmers and 37.6% for rice non-contract farmers. The mean years of schooling household head of rice contract farmers was 4.68 for male and 3.09 for female and rice non-contract farmers was 4.66 for male and 2.32 for female. The mean of household size of rice contract and non-contract farmers was 5.76 and 5.04 members, respectively.

Table 3. Summary of sample household characteristic

Characteristic	CF	Non-CF
Gender of household head (n=64/72)		
Male (%)	82.8	65.3
Female (%)	17.2	34.7
Mean age of household head		
Male (n=53 / 47)	49.82	47.96

Characteristic	CF	Non-CF
Female (n=11 / 25)	46.36	45.45
Educational attainment of household head (n=64/72)		
None (%)	18.8	31.9
Primary school (%)	53.1	37.6
Secondary school (%)	21.9	23.5
High School (%)	6.2	7.00
Mean years of schooling household head		
Male (n=53 / 47)	4.68	4.66
Female (n= n=11 / 25)	3.09	2.32
Household size (n=64 / 72)		
Single person household (%)	1.60	2.80
2 – 4 members (%)	21.8	43.1
5 – 7 members (%)	56.2	40.2
8 or more members (%)	20.4	13.9
Mean household size (Male-headed/ n=53 / 47)	5.74	5.04
Mean household size (Female-headed/ n=11 / 25)	5.36	5.04
Mean household size (All households/ n=64/72)	5.67	5.04

4.2 Household Socio-Economic

The household assets of rice contract farmers that have car (4.70%), motorbike (79.70%), bike (9.40%), television (90.60%), batteries (90.60%), phone (92.20%), tractor (7.80%), and pumping machine (32.80%). The household assets of rice non-contract farmers that have motorbike (37.10%), bike (25.00%), television (88.70%), batteries (88.70%), phone (85.50%), tractor (3.20%), and pumping machine (19.40%). The rice non-contract farmers own had household assets little than rice contract farmers. This could the reason to hinder farmers from engaging in contracts as most of them are able to produce rice for subsistence only.

The average income from non-rice source of rice contract farmers is 385,000 Riels, lower than non-contract rice farmers, 596,000 Riels. However, rice contract farmers have an

average income from other crops higher than non-contract rice farmers. This is due to rice contract farmers receive training on extension services such as animal raising and crop diversification after the harvesting season in average 2.67 times from the NGO contract higher than their non-contract counterparts.

The total credit loan between rice contract farmers and non-contract rice farmers are significantly different. Rice contract farmers and non-contract rice farmers usually borrow credits from money lenders, micro-finance, contracting firms, and their relatives to buy inputs for their farming. Rice contract farmers are required to plant seeds provided either by a private company or recommended by a NGO. Hence, the average ratio of seed credit to their total credit (44.96%) is higher than non-contract rice farmers. However, these two contracting companies are notably not a seed company; they only make the seed available for farmers under the contract. After harvesting season, rice contract farmers usually select good seeds and keep for their own use. When they have faced a seed shortage, they may borrow seeds from other farmers under the contract. The availability of seed credits under the contract is one of the main factors that bring smallholder farmers to engage in the contract. As rice non-contract farmers are not able to obtain credits from either a private company or NGO, they obtain a higher percentage of their credits from money lenders (36.82%), micro-finance (29.69%), and relatives (19.53%) while rice contract farmers obtained 4.15%, 26.13%, and 16.77% from the respective sources. For the credit on fertilizers, the rice contract farmers appeared to receive credit on fertilizers less than non-contract rice farmers. This is because these two contracting firms discourage smallholder farmers from utilizing chemical fertilizers and pesticides. The household socio-economic condition was shown in below Table 4.

Table 4. Summary of household socio-economic

Characteristic	CF	Non-CF
Household assets		
Having car (%)	4.70	0.00
Having motorbike (%)	79.70	37.10
Having bike (%)	9.40	25.00
Having television (%)	90.60	88.70
Having batteries (%)	90.60	88.70

Characteristic	CF	Non-CF
Having phone (%)	92.20	85.50
Having tractor (%)	7.80	3.20
Having pumping machine (%)	32.80	19.40
Sources of household incomes		
Non-rice source (1000 Riels)	385	596
Other crops (1000 Riels)	64	32
Off-farm activities (1000 Riels)	290	542
Ratio of off-farm income in non-rice income (%)	75.32	90.93
Ratio of wage in off-farm income (%)	32.03	33.20
Ratio of remittance in off-farm income (%)	25.4	24.65
Ratio of other activities in off-farm income (%)	42.57	42.15
Sources of credits		
Credit from money lenders (%)	4.15	36.82
Credit from micro-finance (%)	26.13	29.69
Credit from family (%)	16.77	19.53
Seed credit from contractors (%)	44.96	3.53
Fertilizer credit from contractors (%)	7.99	10.43

4.3 Current Status of Contractual Arrangements in Contract Farming

A. Contractual Arrangement

Results from focus groups discussion and key informants interview showed smallholder farmers are being contracted with two different contracting firms, a private company and an NGO in the form of written and verbal agreement, respectively.

The private company has operated written contracting arrangement, which is mediated by village chiefs and commune councils with smallholder farmers (Figure 2). Either village chief or commune council acts as an agent of the private company to prepare and follow up the contract with smallholder farmers, distribute *Neang Malis* seed from the company to smallholder farmers, collect rice yields from smallholder farmers for the company, and

transfer the farming techniques and skills provided by the private company to smallholder farmers. Their specific roles, for instance, is to distribute seeds to the smallholder farmers and record who engages in the contract and total amount of seeds each farmer has received. Smallholder farmers sign a one page contract which clearly states the amount of seed they have received from the company with no interest rate and the amount of land they have planned to plant under the contract for sale to the company.

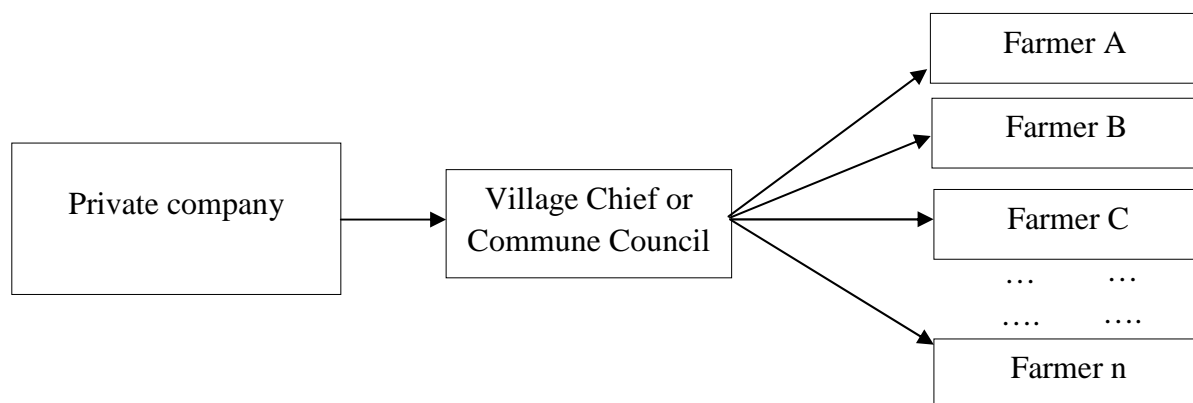


Figure 2. Rice contract farming under the private company contractual arrangement

Unlike the private company, the NGO implemented a verbal contractual arrangement. The NGO contracts with smallholder farmers through setting up farmer into groups instead of agents and works more closely with the community to monitor rice growing practices (Figure3). However, the NGO uses notebook to record farming activities of smallholder farmers including cultivated land and expected amount of utilizing compost, and system of rice intensification (SRI) techniques check list. One contract rice farmer is selected to be a leader and he/she plays an important role to observe and look after the other group members. The leaders of each commune are encouraged to band together as a farmer association. This association was lead by management committees and works closely with the social enterprise representatives to prepare the contract or agreement, coordinate in organizing farming techniques and skills to members, follow up members in organic rice cultivation practices, and finally collect rice yield for the social enterprise. The association is advised by village chiefs who do not act as the NGO's agents. Also, the social enterprise provides small incentive to those communes that meet the standards commensurate with the amount of rice.

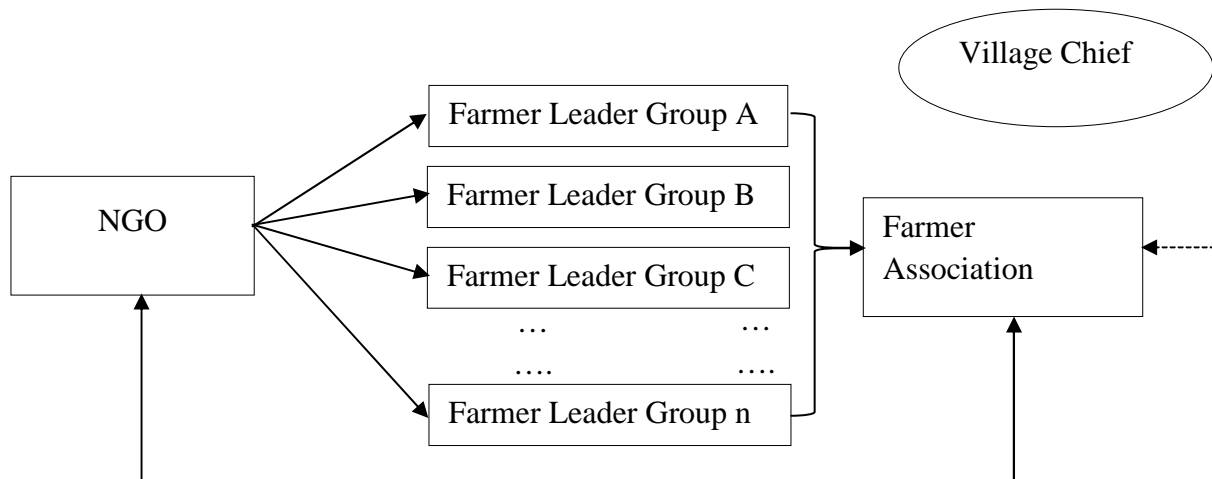


Figure 3. Rice contract farming under NGO contractual arrangement

B. Responsibilities of Contracting Firms and Contractees

Under the private company agreement, they provide rice seed to contract farmers of 30 kilogram per hectare and provide 1-2 days training on farming techniques and skills to the village chief and commune council. The private company provides training to the village chief and commune council in order to upgrade their farming capacity to transfer to contract farmers who are being engaged in the contract. In this agreement, contract farmer are required to produce rice for the company with a minimum volume of 1.5 tons per hectare while the standard average of rice yield is 2.5 tons per hectare. If contract farmers cannot produce the production at a high standard required by the company, the company will reject to buy production from smallholder farmers and in turn require smallholder farmers to compensate for the costs of seeds they received at an expensive rate of 7.00 USD per kilogram. Under the contract, smallholder farmers received 30 kg of seeds per hectare from the company and need to compensate the company in the total amount of USD 210.00 per hectare if they cannot meet company's quantity and quality requirements.

Unlike the private company, the NGO does not provide rice seed to smallholder farmers who engage in the contract, but the training on seed purifying technique and advance cash loan with free interest rate of around 20-30% of the total amount of the expected rice yield supplies to the company during cultivation season. As a NGO, the social enterprise provides farming techniques and other alternative livelihood skills such as animal raising and vegetable plantation. The social enterprise contractor practices farm demonstration and on

field training to members through composting and herbicide utilization. In addition, they encourage mutual trust among farmers by allowing them to buy the company's shares at 100 kilogram of rice per share. In this agreement, contract farmers are required to produce 1-2 tons per hectare while ensuring high quality of organic rice. The use of chemical fertilizers is prohibited under the agreement.

C. Payment Mechanisms

The private company provides financial incentive to smallholder farmers who transport their rice yields from the village to the company. It allocates incentives for transportation of rice yields to its firm into three schemes. Smallholder farmers can get 10.00 USD per truck if they transport between 1.5-2.0 tons, 15.00 USD per truck if they transport from 2.5-4.00 tons, and 20.00 USD per truck if they transport more than 5 tons. The private company provides 100% payment to smallholder farmers when they deliver their rice yield at the company office. The buying prices have been pre-determined between smallholder farmers and contracting firms which add 0.075 USD/kg added to the normal market price.

The payment mechanism under the NGO agreement is allocated into three phases. Phase 1: they provide 20-30% of finance in August to ensure that smallholder farmers have sufficient money for farming operation. Phase 2: they pay for rice delivery of around 20-40% of total expected rice costs on November to January. Phase 3: they pay the rest of 40-50% in the following year after harvesting season during April to June. The social enterprise buys rice yields from smallholder farmers with 10% (0.075 USD/kg) added to the normal market price. They also provide incentive to smallholder farmers in the amount of 12.50 USD per one ton of rice for transportation of their products to the social enterprise's office.

4.4 The Effect of Rice contract farming on Smallholder Farmers' Incomes

As seen in table 5, there was significant difference in the mean of rice planted area between rice contract farmers and non-contract farmers with the mean different of 0.172 hectare. For the price of rice of the rice contract farmers and non-contract farmers, there was strongly significant in the mean the price of rice between rice contract and non-contract farmers. The rice contract farmers can sell their rice product at 299.86 Riel (USD 0.075) higher than their non-contract counterparts. This is in line with the study done by Cai et al. (2008); Gustaf

(2011); Pornpratansombat et al. (2011); Sununtar et al. (2008) who stated that the rice contract farmers can sell their products at premium price higher than their non-contract counterparts. For the yield of rice show a strong significance in the mean of rice yields between rice contract and non-contract farmers. Rice contract farmers can produce yields lower than rice non-contract farmers at 485.11 kg per hectare because the formers used organic fertilizers as per term of contract while rice non-contract farmers used chemical fertilizers to boost their productivity. The result is consistent with the study done by Phil & Ian (2005); Pornpratansobat et al. (2011) who stated that the yields of rice farmers were decreased when engaging in the contract due to the uses of organic fertilizers in place of chemical fertilizers. However, the study done by David & Wilkinson (2009); Gustaf (2001); John (2011); Nham (2012); Robert (2011); Songsak & Aree (2005); Sununtar et al. (2008) showed that the rice yields of farmers could be increased from 20-50% after engaging in the contract farming. The authors supported that the rice contract farmers could receive support from the contractors regarding technical supports and farming management skills which could contribute to an increase in their productivity. The revenue of rice contract farmers and non-contract farmers did not show the significant difference in the mean of revenue between rice contract and non-contract farmers. The mean difference of revenue between rice contract and non-contract farmers was 297365.05 Riels/ha (74.34\$/ha). The study is consistent with that done by Cai et al. (2008) who stated that one may expect that rice contract farmers can sell their rice at higher prices and get higher revenues, which nevertheless turns out not to be the case. For the production cost of rice contract farmers and rice non-contract farmers, there was slightly significant different in the mean of production costs between rice contract and non-contract farmers. The rice contract farmers expensed on production costs of 3.96 times lower than their non-contract counterparts. This was because rice contract farmers used organic fertilizers at lower costs compared to the chemical fertilizers used by the rice non-contract farmers. On average, rice contract farmers expensed production costs of 334154.98 Riel/ha (83.53\$/ha) lower than rice non-contract farmers. The study is in line with that done by David & Wilkinson (2009); Ian (2004); Sununtar & Adam (2008) who stated that rice contract farmers expensed input costs lower than their non-contract counterparts. The seed costs between rice contract and non-contract farmers showed the strongly significant difference at 1% significant level. The rice contract farmers expensed on seed costs at 51779.51 Riels/ha lower than rice non-contract farmers. The study is in line with the study

done by Cai et al., (2008) who stated that the rice contract farmers expensed on seed costs less than their non-contract counterparts. The results also showed the strongly significant in mean of chemical fertilizers cost between rice contract and non-contract farmers at 1% significant level. The rice contract farmers expensed chemical fertilizers costs at 5.7 times lower than non-rice contract farmers because they used organic fertilizers, which can be obtained at surrounding their house with no expenses. The compose fertilizer cost between rice contract and non-contract farmers also show the strongly significant between their means at 1% significant level. The rice contract farmers expensed on compose fertilizers at 2.6 times higher than non-contract farmers, with the mean different of 142128.20 Riels/ha (35.53\$/ha). The preparing land cost between rice contract and non-contract farmers also showed the significant difference at 1% significant level. The rice contract farmers expensed on cost of preparing land at 3.13 times lower than non-contract farmers, with the mean different of 100047.22 Riels/ha (25.01\$/ha). For the gross incomes of rice contract farmers and non-contract farmers, there was no significant difference in the mean of gross incomes between rice contract and non-contract farmers. The mean difference between rice contract and non-contract farmers is 18628.47 Riels/ha (4.65\$/ha). This study is consistent with that done by Elbert & Agustin (2009); Killian (2012) who stated that there was no significant difference on the mean of gross incomes between rice contract farmers and non-contract farmers. The results also showed that there were no significant difference in the mean of pesticide cost, pumping cost, transplanting cost, harvesting cost, labor cost, and management cost between rice contract and non-contract farmers.

Table 5. Farm Production: Revenue and Production Costs

Variables	CF Mean	Non-CF Mean	Mean Different	t- statistic
Rice Plant Area (ha)	1.1718	0.999	0.172*	1.683
Revenue (Riel/ha)	2176087.97	1878722.92	297365.05	1.745
Rice price (Riel/kg)	1490.00	1190.14	299.86***	24.865
Yield (kg/ha)	1953.20	2438.32	-485.11***	-3.875
Production Cost (Riel/ha)	758065.16	1092220.14	-334154.98***	-3.963
Seed Costs (Riel/ha)	54234.38	106013.89	-51779.51***	-6.067
Chemical fertilizer cost	33229.18	160202.31	-126973.12***	-5.723

Variables	CF Mean	Non-CF Mean	Mean Different	t- statistic
(Riel/ha)				
Compose fertilizer cost	242666.67	100538.46	142128.20***	2.649
(Riel/ha)				
Pesticide cost (Riel/ha)	20384.62	21571.43	-1186.813	-0.160
Pumping cost (Riel/ha)	109161.90	103879.31	5282.59	0.264
Preparing land cost (Riel/ha)	108975.00	209022.22	-100047.22***	-3.132
Transplanting cost (Riel/ha)	173925.00	224022.22	-50097.22	-1.569
Harvesting cost (Riel/ha)	286400.00	330069.76	-43669.76	-1.205
Labor costs (Riel/ha)	267285.00	272708.92	-5423.92	-0.251
Management cost (Riel/ha)	107480.00	86166.67	21313.33	0.719
Gross income from rice	2910156.25	2891527.78	18628.47	0.117
(Riel/ha)				

*Different in means that significant at the 10% levels.

**Different in means that significant at the 5% levels.

***Different in means that significant at the 1% levels.

4.5 Challenges of Rice Contract Farming for Smallholder Farmers

The major challenges that smallholder farmers are face with under rice contract farming arrangement include limited choice of crop inputs, inability to meet quality requirements, false quality claims from contracting firms, difficulty in meeting quantity criteria, dishonest quantity measurement by contracting firms, contracting firms cannot make payment according to the pre-determined schedule, tight production schedule, high transaction costs, and insufficient knowledge related to farm management (Table 6).

Under the NGO contract farming, the contracting firm that cannot make a payment according to pre-determined schedule (34.7%) is the greatest challenge that rice contract farmers are face with, followed by a limited choice of crop inputs (26.3%), high transportation costs (11.6%), difficulty in meeting quantity criteria (8.4%), tight production schedule (6.3%), insufficient knowledge related to farm management (6.3%), false quality claim from

contractor (3.2%), dishonest quantity measurement by contracting firm (3.2%), and none of them are challenged with inability to meet quality requirement. The reason that rice contract farmers considers refusal to pay money according the pre-determined schedule by contracting firm as the most challenging is because the formers borrowed money from moneylenders in the village and need this money back at harvesting season.

"I have borrowed money from moneylender in villages, and I promise to give the money back after I get money from selling rice to contractor, but the contractor does not pay money due to the schedule. They promise this date, that date, but finally I still get nothing. I do not trust on contract farming any more".

Rice contract farmer in Trapeang Kok Village, Toul Sala Commune, Borsedth
District, Kampong Speu Province (Interview on 26th April 2013)

When contractor cannot make payment at time of promise, the farmers then cannot make a payment to the moneylender. Consequently, the debt they have borrowed has doubled. For meeting the quality requirement, rice contract farmers did not consider it as a challenge because the NGO contractor is not strict on quality control and monitoring. Even if the NGO contractor finds that chemical fertilizers have been inserted into organic field or the rice quality does not met the standard requirement; they have never refused to buy rice products from smallholder farmers.

In the contract farming under the private company arrangement, the limited choice of crop inputs (25%) is the main challenge that rice contract farmers face, followed by false quality claims from contracting firm (19.8%), insufficient knowledge related to farm management (19.2%), high transportation costs (11.2%), tight production schedule (7.8%), inability to meet quality requirement (8.6), dishonest quantity measurement by the contracting firm (4.3%), difficulty in meeting quantity criteria (3.4%), and none of them are challenged regarding to the payment from the contracting firm as the firm deliver the total payment at time of receiving products from farmers. The reason that limited choice of crop inputs is considered as the most challenging for rice contract farmers is because the use of seed and chemical fertilizers are strictly monitored by the private company's agents. The private company provides seed for rice contract farmers and closely monitors their rice cultivation practice monthly. If the private company finds that chemical fertilizers are inserted into the

contracting field, they will reject to buy the rice produce. In this case, rice contract farmers shall have to pay back for the seed fees to the private company in the amount of USD 7.00 per kilogram of seed, as stated in the agreement.

Initially, some farmers mix chemical fertilizers into their contracting field in order to increase production. But, when the private company found at time of receiving their produce, they rejected to buy rice and enforce them to pay for the seed fee USD 7.00 per kilogram.

Village Chief in Trapeang Kok Village, Toul Sala Commune,
Borsedth District, Kampong Speu Province (Interview on 26th April 2013)

Table 6. Challenges faced by smallholder farmers in rice contract farming

Challenges of contract farming for smallholder farmers	NGO (%)	Private Company (%)
Limit choice of crop inputs	26.3	25
Inability to meet quality requirement	0	8.6
False quality claims from contracting firms	3.2	19.8
Difficulty in meeting quantity criteria	8.4	3.4
Dishonest quantity measurement by contracting firms	3.2	4.3
Contracting firms cannot make payment according to pre-determined schedule	34.7	0
Tight production schedule	6.3	7.8
High transportation costs	11.6	11.2
Insufficient knowledge related to farm management	6.3	19.2

Based on this finding, it shows that the reasons that smallholder farmers exit from the contract farming implemented by the NGO was different from that of the private company. As the NGO is a non-profit oriented organization and does not have sufficient budgets to pay farmers at time of receiving products. This is also the reasons why they allocate the payments to farmers into three phases. When they unfortunately cannot sell their products (products that were collected from farmers) at the time of expected due to the market congestion, they cannot get the money and then the payment to farmers is respectively delayed behind the

schedule. Consequently, the farmers are unsatisfied with the contractual arrangement of the NGO and many of them have exited and planned to exit in the following year of contract arrangement.

Unlike the NGO, the private company has sufficient budgets to pay farmers at time of receiving products, but being a profit making company, the private company is very strict with use of chemical fertilizer. Any encounters of chemical use in organic rice produce could result in rejection of buying from farmers. The enforcement of this quality control, however, is often used against farmers. The private company does not explicitly specify the condition related to production method in its contract with farmers, but demanding all farmers to obey its quality control mechanism. Many farmers claim that the private company uses technical reasons to reject or lower the prices of rice that they have transported to the firm. For this reason, the farmers are also unsatisfied with contract farming and ultimately exit from the contract.

To conclude, rice contract farmers have exited from the contract on the one hand regarding two main factors that include the payment which is not according to predetermine schedule and the use of quality control against farmers. On the other hand, the rice contract farmers have exited from the contract, perhaps, because of no significant difference between engaging and not engaging in the contract. Ultimately, the farmer prefers to exit from the contract rather than bonding in the pre-determined conditions with contract in rice cultivation.

4.6 Rice Contract Farming Model for Smallholder Farmers

Based on the finding, the contract arrangements need to be improved and the adherence to the contract guidelines from parties involved need to be enhanced. The arrangement should involve three parties: contractor, smallholder farmers, and local authority (Figure 4). The local authority should play important roles in encouraging both parties to respect to the pre-determined guideline and enforcing intervention when parties involved do not adhere to the contract guideline, rather than act as just an agent with no authorization in the contract.

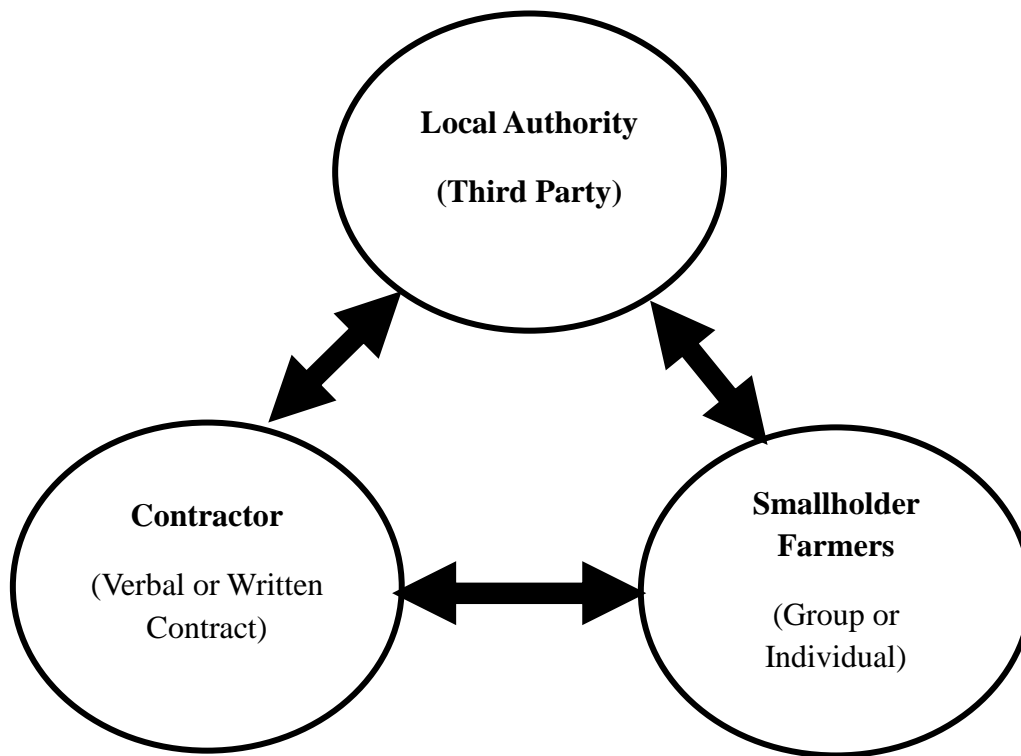


Figure 4. Rice Contract Farming Model in Cambodia

Drawing lesson from contract farming studies in Southeast Asia, it is not a group or individual, the oral or written contract per se which structure the outcome, but rather how it is practice in a given context. However, the contract farming arrangement should be simple and easy to understand, the contract should encourage mutual trust and respect from both parties, the contract should be flexible and negotiable, clearly state the responsibilities of both parties, and the payment should be made to farmers when the produce is delivered/received.

A. Contractual Arrangement

-Contract formats should be simple and easy to understand

The contract format should be kept as simple as possible. If the contract is under written form, the contracts should be written in a clear and coherent language with a legible type using words that are understandable by a farmer of little former education and experience. Confusion and misunderstanding can easily occur if the terms of agreement are not clearly explained and understood. If the contract is under verbal agreement, the ensuring of mutual

trust and respect from each party should be encouraged in contract farming operation. The contracting firms should provide contracts that contain honest and accurate information, are easy to read and understand, and clearly outline the responsibilities of both parties. Moreover, the contract should include the conflict resolution and be made through the farmers association in order to empower them with bargaining the price and lead the contract arrangement to be more equitable and sustainable.

-The contract should encourage mutual trust and respect from both parties

Both contractors and contractees should respect each other and adhere to the contract guideline. The contractors should provide sufficient supporting inputs and accurate technical assistant training to contractees as to what is stated in the contract. The contractors should at the same time provide produce to contractees with pre-determine quantity and quality standard. As price is one of the important factors for the success of contract farming, pre-determined prices often lead to problem of opportunism. To circumvent the problem of opportunism by farmers, contractors should set the price conditional on the prevalent market price, and pay some premium over it. The Contractors should assure transparency in price determination and payments procedures, avoiding complex formulas that are not well understood by farmers. Besides, contractors should clearly disclose every charge or deduction that may affect the net amount paid to the farmer under the contract.

-The contract should be flexible and negotiable

As the contract farming system is not appropriate for all types of agricultural products, nor should appropriate in all situation or environment, the design of the contract be flexible and renegotiable in the agreement by both parties. As such, farmers and contracting firms should contemplate the possibility to renegotiate the terms of the contract. This should be possible in case of unexpected events such as high inflation, disease epidemics, insect plagues, and climatic factors (droughts and floods). Contracts should also include the possibility to undertake price revisions in case of unexpected events, such as substantial change in market conditions leading to large differences in price with respect to the contracted terms.

B. Responsibilities of Contractors and Contractees

-The contract should clearly state the responsibilities of both parties

The contracts should clearly state the responsibilities of contracting firms and contractees in particular with the issue of production sharing and market risks among the firms and farmers. The contracting firms should clearly disclose important terms of the agreement such as contract duration and termination, delivery of products, productions quotas, quality standards and means of assessing these on delivery and renegotiation standards. The contract should clearly state the contracting firms' liabilities if it does not buy contracted produce at the pre-determined prices, instead of only about the responsibilities of contracting firms to buy produce from farmers. The contracts need to state the compensation paid to farmers if the firm breaches the contract.

C. Payment Mechanism

-The payment should be made to farmers when the produce is delivered/received

The payment should be strictly followed according to the pre-determined schedule between smallholder farmers and contractor. Late or delay payments can discourage smallholder farmers to continue the contract. Smallholder farmers mostly have taken loan from moneylenders or micro finance. Hence, they usually depend on revenues from selling their products to pay for the interest. If payment is delayed, they are not able to repay the money back and the interest will also increase.

5. Conclusion and Recommendation

5.1 Conclusion

The contract farming studies in Southeast Asia showed that it is not a group or individual, the oral or written contract per se which structure the outcome, but rather how it is practiced in a given context, depending on the nature of the contract, geographical location, and socio-economic situation of the smallholder farmers. This research demonstrated that rice contract farming arrangement have been operated through both verbal and written agreements with NGO and private company, respectively. For the effect of contract farming on smallholder farmers' incomes, there was no significant difference in the mean of gross incomes between

rice contract and non-contract farmers. Rice contract farmers have exited from the contract on the one hand due to two main factors that include the payment which is not according to predetermine schedule and the use of quality control against farmers. On the other hand, the rice contract farmers have exited from the contract, perhaps, because of no significant difference between engaging and not engaging in the contract. Ultimately, the farmer prefers to exit from the contract rather than bonding in the pre-determined conditions with the contract in rice cultivation. The exiting contract arrangements need to be improved and adherence to the contract guidelines from parties involve need to be enhanced. If contracts are well designed and implemented, it can potentially lead to the betterment of all the parties involved. Accordingly, a comprehensive understanding of the environment-socio-economic background of smallholder farmers should be taken into account in order to determine the potential for contracts to work in favor of both the contracting firms and contractees.

5.2 Recommendations

Drawing lessons from this study, some recommendation has been recommended as following:

- **The NGO contractor should deliver the payment in accordance to the predetermined schedule:** Traditionally, farmers borrow money from village moneylenders and promise to pay them back after harvesting season. Thus, the delivery of payment according to the predetermined schedule can build the trust among the farmers and allow farmers to pay back on time to the village moneylenders.
- **The private company contractor should clearly state the terms of purchase the product from farmers in detail:** In the current contract, the private company is obligated to buy rice from farmers at the minimum price without clearly specifying the terms of purchase in detail. Also, the current contract does not state its liabilities if it does not buy contracted rice at predetermined prices. A clear state of terms of purchase in the contract can secure the farmer from rejection or lower the price of product when farmers have already transported to the firm.
- **The NGO and private company contractor should provide regular training and technical supports to farmers:** The experiences of contractees in engaging in rice contract farming arrangement in Cambodia is relatively new. Provision of training and

technical supports can increase confidence among farmers in organic rice cultivation and potentially for increasing productivity.

- **The farmers should practice their farming according to the predetermined guideline and regulation:** The honesty of farmers is very important in building trust with contracting firms. In particular, the farmers should avoid using chemical fertilizers and in turn supply adequate amount of produces to contracting firms at predetermined quantity and quality standards.
- **The local authority should be involved and act as third parties in the contractual arrangement of contract farming:** The local authority can play an important role in encouraging and facilitating both parties, contractees and contractors, to respect and adhere to the contract guideline towards each other.

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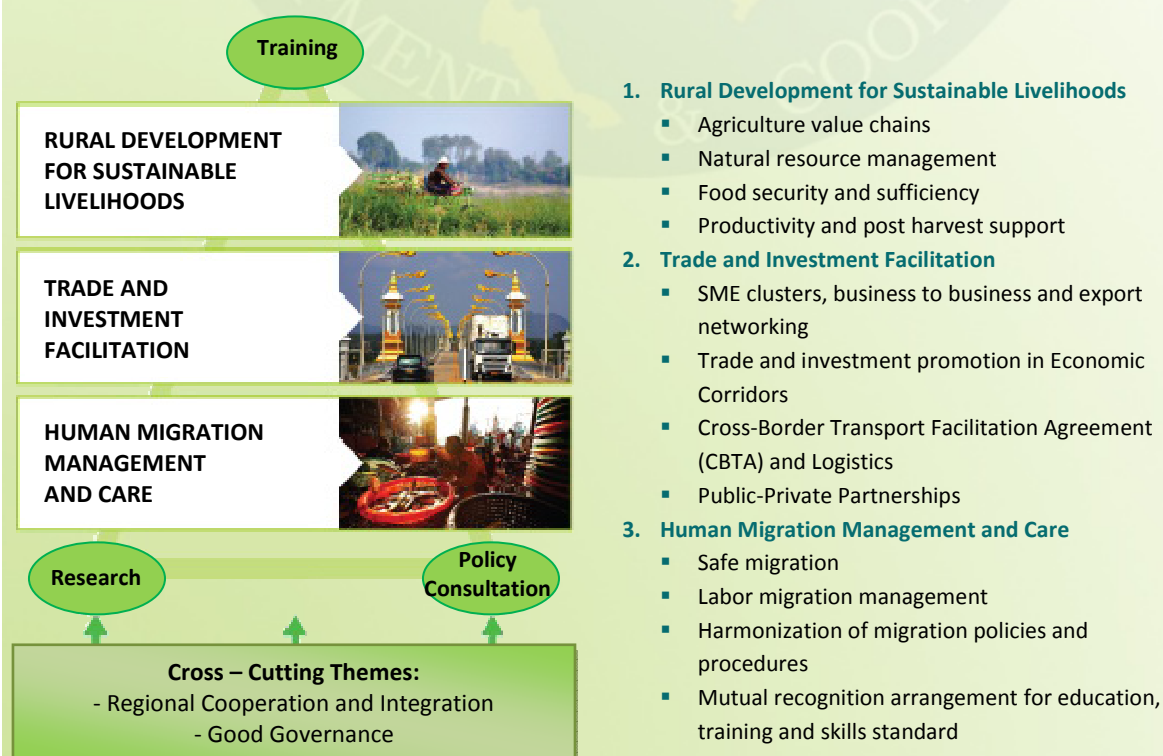
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