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Benefits and Efficiency of Cabbage Production of Lao Farmers Under Thai-Laos Contract Farming

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The purpose of this study was twofold: (1) studying the capital and the income that the Lao agriculturists had after planting cabbage; and (2) studying the cabbage production efficiency of Lao agriculturists. One hundred and eighteen Lao agriculturists participated in the contract farming project, 10 months were spent on the study. There are two research questions: (1) How much was the per unit cost and investment return on cabbage in the contract farming project? and (2) What is the effectiveness of the production of cabbage in this contract farming? The research tools employed in this work were questionnaires and interview schedules and descriptive statistics were employed for frequency, percentage, and calculation of the stochastic production frontier in order to calculate the degree of production efficiency. The findings were: (1) There were two highly flexible forms of contract farming under the Thai-Laos contract farming agreement: one was the official written agreement that needed the signatures of both parties and the other was the unofficial oral agreement; (2) The annual revenues for cabbage production were 2,859.30 USD per hectare, the capital costs were 2,139.07 USD per hectare, and the net profit was 720.23 USD per hectare; and (3) The production efficiency of cabbage was concentrated at the lowest level between 0.00-0.50 (86.44%), which was risky for Lao agriculturists. Therefore, urgent assistance with production techniques is needed from the government sectors.

Keywords: Thai-Laos contract farming, efficiency of production, cabbage in Pak Chong, Lao farmer

Introduction

Contract farming was implemented in Thailand as part of the agro-industry cooperation program "Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS)". The aim of this program is to expand occupations, increase income, develop the local area, and convey technology to ACMECS members including Laos, Cambodia, and Burma. It also aims to decrease the economic gap. Meanwhile, target and deficient vegetables are conveniently imported from neighboring countries to Thailand.

As to be sister cities and be ready to conduct the contract farming capably (Ubon Ratchathani Chamber of Commerce, 2012), Ubon Ratchathani and Champasak were regarded by the Office of the National Economics and Social Development Board (NESDB) as the pilot cities to do the activity under the official 2006 agro-product agreement that drew much interest from Thai businessmen.

Since then, businessmen from the private sectors have been interested in contract farming in neighboring

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countries; Laos is particularly considered as the number one option. Generally, Thailand will make concessions to Lao for agro-product, as a plenty of land is available, to meet the domestic demand, particularly some small wetlands that are found throughout the country. These wetlands are appropriate for industrial crops, for example, cabbage, cultivated bananas (Kluai Namwa), soy beans, maize grain and so on.

Cabbages as an industrial crop are primarily imported from Laos. In 2011-2012, a huge amount of cabbage was imported (230,407.50 tons and 459,571.80 tons that cost $37,162,500 and $74,124,483.87 respectively) (Chongmek Custom, 2012). This type of vegetable is frequently planted in Pak Chong, Champasak, on approximately 2,400 Rai of crop areas and is conveniently located to be able to cultivate the 100-200 tons daily (Ubon Ratchathani University, 2011). Therefore, Pak Chong, Champasak, is commercially capable of planting cabbage because Lao farmers do not rely much on academic support nor farming materials.

Though the contract farming is a hope for farmers and government sectors, it gives both advantages and limitations. Eaton and Shepherd (2001) conducted a comparative study regarding difficulties concerned with contract farming from both party's businessmen and the Lao farmers. It found that the former party faced social and culture limitations that probably affected the ability of the farmers to produce standard products as specified by buyers or entrepreneurs. In addition, improper management and incomplete discussion with the farmers can result in dissatisfaction of the farmers, as well as the farmers may distribute of products by the farmer to outsiders resulting in the contract counterpart being unable to fully supply products to the factory. Because of uncertain marketing, farming difficulties, and ineffective management, the farmers face uncertainty in selling the given quota of cabbage.

Risk is an unavoidable factor in contract farming. Ekasingh (2011) studied the risks of contract farming conducted in Chiang Mai and Lamphun. Those risks are divided into three groups: (1) The risk by farming is still high because contract farming is without any assurance, particularly since farmers still rely on nature with less involvement in soil fertility and the proper use of technology; (2) Marketing risk comes mainly from the product itself because the price is fixed by the buyers only, and the farmers lack of marketing knowledge make them do not have the ability to keep up with up-to-date information and most importantly they have to sell products instantly to pay debt; and (3) Price risks are very strict, in particular its assurance. What is not mentioned in this study is the ownership of land. Lao farmers feel like they are living without security if they do not legally own their land.

Hardaker, Huirne, and Anderson (2002) studied the risk management and mentioned five items about the risk in contract farming: (1) Product risks come from unpredictable weather, amount of products, epiphytotic and so on; (2) Price and marketing risks are caused by unknown production factors and market price, so the farmers have to make decisions with uncertainly; (3) Institutional risk comes from the current regulations quickly changing not always giving the farmers time to adjust suitably resulting in the loss of money; (4) Self-risk factor results if the former's lack of proper health care results in illness; and (5) Financial risk is related to the inaccessibility of investment funds at the right time.

Boonbrahm et al. (2011) carried out a study on Thai-Laos contract farming and found that Laos farmers have only primary educations and do not understand the way to apply updated technology to agro-products. The agreement and the contract farming itself are different. Sometimes, it is made in written language making it hard for the farmers to understand all of the details mentioned in the contract and that may cause a loss in benefits or lead to the misconceptions regarding either the farming and marketing requirements. As mentioned, this could cause accidental breaks in the contract and could result in contractor risks of uncertainty regarding

delivery of products. This study focused on the law and rules.

Besides, the studies of both Boonbrahm et al. (2011) that emphasize farmers' benefits, other interesting points of contract farming that should be looked at further are: an economic analysis of particular costs, production factors, and production effectiveness as to be the inter-trade promotion between Thailand and Laos; the degree of benefits of both Lao farmers and Thai traders; the production effectiveness; whether economic support from government sectors of both parties to the ACMECS could finally lead to effectiveness of the Thai-Laos trade promotion.

Purposes

The purposes of the study are:

(1) To study the costs incurred and investment returns by Lao farmers in Pak Chong, Champasak, from planting cabbage;

(2) To study the production effectiveness of cabbage farming in Pak Chong, Champasak, as it relates to this contract farming.

Significances

The significance of the study includes:

(1) The results of the study regarding the cost and investment return can provide support to the trade promotion policy of both countries;

(2) All concerned people will be able to plan, support, and strengthen production skills of Lao farmers, according to the production effectiveness of the contract farming.

Scopes of the Study

Scopes of the study include:

(1) Population: Lao farmers participating in contract farming in the Thai-Laos project between Ubon Ratchathani and Champasak: 118 people;

(2) Using the purposive sample technique, the sample group was 118 Lao farmers, six Thai and Lao officials, and three Thai and Lao traders;

(3) Duration of the study: 10 months from February 2012 to November 2012.

Research Methodology

Research Questions

(1) How much was the per unit cost and investment return on the cabbage in the contract farming project?

(2) What is the effectiveness of the production of cabbage in this contract farming?

Project Site

The target site of the study is Pak Chong, Champasak, Laos PDR (Southern Laos) as in Figure 1.

Farmer Sample Selection

A target group of 118 Lao agriculturists who grow cabbage in the contract farming project in Pak Chong, Champasak, Lao PDR with the purposive sampling are as in Table 1.

Figure 1. Map of Champasak, Lao PDR.

Table 1

List of Villages in Pak Chong District in Champasak, the Lao PDR

Village	Number of household	Number of household cultivating cabbage	Number of farm households participating in contract farming
Thonset village	265	29	29
Katuad village	110	62	62
Lichaing village	233	29	29
Nongsoong village	150	60	60
Total	758	118	118

Note. Source: Department of Industry and Commerce (2012).

Research Tools

The research tools employed in this study include questionnaires and semi-structured interviews that were divided into three parts set by the scopes of the study:

(1) Part one: Primary information on Lao farmers and their economic and social situation;

(2) Part two: Information on the cabbage product regarding the contract farming, production factors in 2011, and expenditures for planting cabbage;

(3) Part three: Production management under the contract farming.

Data Collection

(1) Interview Thai traders, Lao traders, Thai officials, and Lao officials;

(2) Collect information from 118 Lao farmers participating in the contract farming project, Champasak, Pak Chong;

(3) Examine the completed questionnaires.

Data Analysis and Statistic

(1) Descriptive analysis

The rationale, methodology, advantages, and limitations of contract farming are studied as well as providing the roles of trade promotion of the government sectors and recommendations.

(2) Statistical analysis

Frequency and percentage are used to analyze the background and economic situation of Lao farmers which was then presented in the tables and summarized in this paper.

Regarding the economic theory, cost and return on investment are analyzed to determine an estimation of all payments including materials, labor, amortization, and household payments, and then accurately converted to their value in currency.

The cost of cabbage farming includes variable costs which are volume-related and are paid per unit produced and fixed costs that are not dependent on the level of goods or services produced by the business. They tend to be time-related and the cost approach includes cash and non-cash payment.

Break-even analysis of cabbage includes break-even point of product per hectare and break-even point of selling price.

$$\text{Break-even point of product per hectare} = \frac{\text{Total Fixed Costs (Thousand LAK per hectare)}}{\text{Unit Sell Price (Thousand LAK per ton)}}$$

$$\text{Break-even point of selling price} = \frac{\text{Total Fixed Costs (Thousand LAK per hectare)}}{\text{Unit Variable Cost (ton per hectare)}}$$

The stochastic production frontier is employed to analyze the production effectiveness and technical effectiveness.

Conclusion Results and Discussions

Background of Lao Farmers

Most of local Lao farmers graduated at the primary school level Prathomsuksa 4-5 (50.85%), as the highest degree of primary school in Laos is Prathomsuksa 5. This is similar to Thai farmers who working as labor will finish with only a primary education. Next, families consist of about 4-5 people and some of them work as farmers (51.69%). The size of their farm is less than 3 or 1.49 hectare on average. Rain or groundwater is most often relied on (74.58%) because there are no irrigation systems. Therefore, people who do not live near natural water resources need to drill for water themselves (25.42%), which results in extra payments.

The main income of the farmers is from selling cabbage (32.46%). Therefore, cabbage is still an industrial crop in Champasak as in Figure 2. Land or the farming area is legally owned by 97.46% of the Lao farmers surveyed and they feel security in the workplace. However, some of them (2.50%) still pay rent for their land for cabbage farming.

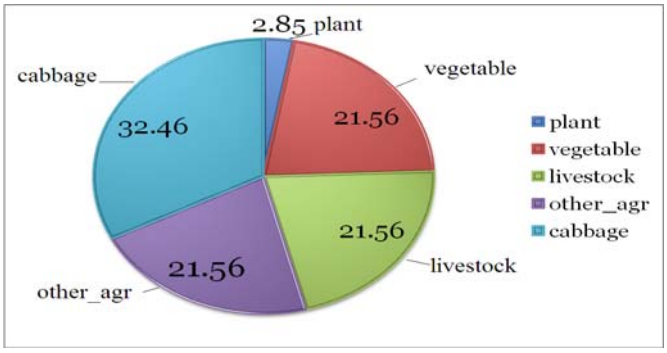

Figure 2. Proportion of income in the agricultural sector.

Costs and Investment Return in Contract Farming

Estimation of costs—Here is the estimation of costs includes cash and non-cash payment:

- Loan interest: It is estimated amount of the loan and interest rate paid to the source of the investment funds;
- Opportunity loss: Money for buying machines is rated at 2.5% per year (that is equal to the deposit interest rate at the bank);
- Household labor costs: These are estimated based on a labor cost of 40,000 LAK per person per day;
- Land rent: If the land is rented, it is actual cost. If they legally own the land themselves, it is estimated based on the local rental charge of 808.03 thousand LAK per hectare per year;
- Investment interest: The investment interest is rated at 3% (equal to bank's deposit rate) if Lao farmers pay for their own farming materials;
- Production costs, including seeds, chemical fertilizer, insecticide and so on, are actual costs.

Cost analysis and investment return from cabbage. Costs and investment return from cabbage will be analyzed for frequency of productive farming that takes about 3-4 a month for one time.

In this study, the amount of product per hectare, income per hectare, net profit per hectare, variable costs per hectare, and net profit in cash per hectare are employed to estimate the investment return. The results reveal that the average amount of product in contract farming per hectare is 23.20 tons. The average unit sell price is 962.38 thousand LAK per day. Total income that Lao farmers gain from selling cabbage is 22,327.22 thousand LAK per hectare or 962.38 thousand LAK per ton. If the capital costs 16,703.18 thousand LAK per hectare is deducted, the net profit will be 5,624.04 thousand LAK per hectare. And, if total capital costs are deducted, the net profit in cash will be 10,725.13 thousand LAK per hectare as in Tables 2 and 3.

Table 2

Costs and Investment Return From Cabbage Product Unit: (1,000 LAK/Hectare)

List	Cash	Non-cash	Total	%
1. Variable cost	11,602.09	2,701.75	14,303.84	85.64
1.1 Labor and machine				
Soil preparation	685.59	93.73	779.32	4.67
Planting cabbage	337.94	319.98	657.92	3.94
Watering	0.00	526.98	526.98	3.15
Fertilizing	128.64	154.54	283.18	1.70
Lawn mowing	162.21	239.48	401.69	2.40

(Table 2 continued)

List	Cash	Non-cash	Total	%
1.1 Labor and machine				
Herbicide application	123.46	292.00	415.46	2.49
Pesticide application	106.31	52.24	158.55	0.95
Plant pathology killer application	93.52	120.79	214.31	1.28
Cultivating, packing, and carrying	1,927.58	389.17	2,316.75	13.87
Post-cultivation	117.34	58.43	175.77	1.05
1.2 Materials cost				
Seed	1,402.73	0.00	1,402.73	8.40
Chemical fertilizer	3,030.07	0.00	3,030.07	18.14
Manure	640.56	0.00	640.56	3.83
Pesticides	574.91	0.00	574.91	3.44
Herbicides	27.44	0.00	27.44	0.16
Chemical for plant pathology	262.22	0.00	262.22	1.57
Petrol and lubricant	1,188.74	0.00	1,188.74	7.12
Repair costs	792.83	0.00	792.83	4.75
1.3 Miscellaneous	1,556.72	0.00	1,56.72	9.32
1.4 Marketing cost	2,088.18	0.00	2,088.18	12.50
1.5 Opportunity cost	0.00	454.41	454.41	2.72
2. Fixed cost	808.03	1,591.31	2,399.34	14.36
Land rent/opportunity cost for land use	808.03	0.00	808.03	4.84
Depreciation of material	0.00	921.39	921.39	5.52
Opportunity cost for materials payment	0.00	669.92	669.92	4.01
3. total costs per hectare	12,410.12	4,293.06	16,703.18	100.00
4. total costs per ton	534.92	185.05	719.96	

Notes. Average area is 1.49 hectare per household: 7,806 LAK = 1 USD. Source: Calculation on data collected.

Table 3

Investment Return From Cabbage Unit: (1,000 LAK/Hectare)

List	Investment return
(1) Amount per hectare (ton)	23.20
(2) Average price (thousand LAK/ton)	962.38
(3) Total income (thousand LAK/hectare)	22,327.22
(4) Variable cost (thousand LAK/ton)	616.54
(5) Net profit (thousand LAK/hectare)	5,624.04
(6) Net profit (thousand LAK/ton)	242.42
(7) Break-even point (thousand LAK/hectare)	10,725.13
(8) Break-even point (thousand LAK/ton)	462.29

Notes. Average area is 1.49 hectare per household: 7,806 LAK = 1 USD. Source: Calculation on data collected.

Technical Efficiency of Production

The stochastic production frontier and the technical efficiency of production yield an average technical efficiency of 0.291 which is very low. The technical efficiency of household and the technical efficiency of production are not different because there are several similar factors, for example, farm, technical skill, no proper technology application as well as unsupported technical farming technique as in Table 4 and Figure 4.

Table 4

Technical Efficiency of Cabbage Farmers

Technical efficiency		Number of farmer	Percent
Very low	(0.0000-0.5000)	102	86.44
Low	(0.5001-0.6000)	5	4.24
Medium	(0.6001-0.8000)	7	5.93
High	(0.8001-0.9000)	3	2.54
Very high	(0.9001-0.9999)	1	0.85
Total		118	100.00

Note. Source: Calculation on data collected.

In the 118 households of Lao farmers in Pak Chong, Champasak, surveyed, a cluster 102 (86.44%) households with a technical efficiency between 0.0000 and 0.5000 and there is only one household (0.85%) from the group having a technical efficiency of between 0.9001 and 0.9999. The information mentioned here aims to let concerned people realize that these farmers still need urgently support and technical assistance for farming cabbage as can be seen in Table 4.

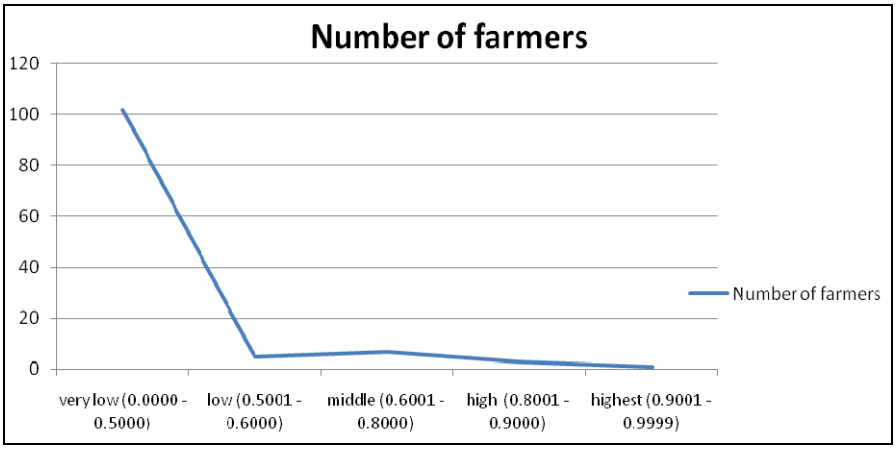

Figure 3. Cabbage farmers' efficiency of Laos.

From the results above, there is a misunderstanding by the government sectors and other concerned people that Lao farmers need no technical supports because the geography of Champasak itself is plentiful with soil fertility and the farmers themselves are so skillful in farming. But, actually contract farming production will be higher, if the farmers are supported or promoted necessary factors as follows:

- Primary production depends on natural water resources, and/or the amount of rain in the rainy season, and soil fertility. Besides the natural water resources, good irrigation is in need that is over reach of the government but none of support or promotion is given yet. Similarly to soil fertility, neither is training or knowledge about land development disseminated;
- There is a misconception of the government sectors of both Thailand and Laos PDR that Champasak has rich fertile soil and that the farmers are skillful in farming cabbage; therefore, there should be no problem in growing as many vegetables as the market demands. Such an understanding is at fault because cabbage is planted three to four times a year and they get a huge amount of product but without the quality;
- Lao farmers misunderstand in the method of farming cabbage even though they have had experience in dealing with cabbage farming for all their life, people believe that because of this experience the products they

grow will definitely have high quality but actually this is not the case. If Lao farmers give assistance or technical support as well as their innate experience, product or its quality will change for the better;

- Contract farming is the hope of many concerned people. Lao farmers wish to get a better life with enough income, the government wishes to raise the economic situation of the population, and a number of products are demanded for market in Thailand. Therefore, all people need to rely on each other in order to maintain the production system.

Recommendations

The government should promote and provide native Lao farmers with the technical support and production plans as required by Thai traders. If there is an oversupply, in case where the products of both countries are ready to sell at the same time and perhaps it is found that the cost is two Baht lower than the price fixed in the contract, the Lao government should look for other neighboring markets like Cambodia or in other big cities in Lao.

Though cabbage is a traditional vegetable that needs no complicated plating method, the government should promote and support the proper technology, particularly skill for soil fertility and probably ask for assistance from Thai sector like Provincial Agriculture Office, Ubon Ratchathani in order to help provide technical production skills. Also, the irrigation in Laos should be developed, then, when Laos becomes part of ASEAN, the production system will be good enough to compete with other member.

References

Boonbrahm, N. et al. (2011). *Pilot project: Contract farming Ubon Ratchathani—Champasak under the ACMECS*. Bangkok: Thailand Research Fund.

Chongmek Custom. (2012). *Vegetable import statistics*. Retrieved from http://www.chongmekcustoms.com/default.asp

Da Silva, C. A. B. (2005). *The growing role of contract farming in agri-food systems development: Drivers, theory and practice*. Rome: Food and Agriculture Organization of the United Nations.

Department of Industry and Commerce. (2012). *List of villages in Pak Chong District in Champasak*. Lao PDR: Government Printing Office.

Eaton, C., & Shepherd, A. W. (2001). Contract farming: Partnerships for growth. FAO Agricultural Services Bulletin No. 145, Rome, Food and Agriculture Organization of the United Nations.

Ekasingh, B. (2011). *Justification in contract farming*. Bangkok: Chulabhorn Research Institute.

FAO. (2002). *Contract farming: Partnerships for growth*. Rome: Food and Agriculture Organization of the United Nations.

Hardaker, J. B., Huirne, R. B. M., & Anderson, J. R. (2002). *Coping with risk in agriculture*. Wallingford: CAB International.

Manorom, K. et al. (2011). *A policy study of the twin cities: Cases of the contract farming between Ubon Ratchathani province and Pakse town of Champasak province of Lao PDR*. Bangkok: Thailand Research Fund.

Royal Thai Consulate-General, S. (n.d.). *Contract farming*. Retrieved January 1, 2011, from http://www.thaisavannakhet.com/savannakhet/th/data-service/contract-cf/

Sriboonchitta, S., & Wiboonpoongse, A. (2008). *Overview of contract farming in Thailand: Lessons learned*. ADBI: Asian Development Bank Institute.

Ubon Ratchathani Chamber of Commerce. (2012). *Sister city*. Retrieved from http://www.uboncham ber.com/

Ubon Ratchathani University. (2011). *Library self access learning center*. Retrieved from http://sac.la.ubu.ac.th/Search/display.asp?id=36152