A Comparison of Paddy Price Insurance Project and Paddy Mortgage Project on Thai Farmers' Living Standard

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Abstract

The main objectives of this research were to compare average return and cost of rice cultivation between Paddy Price Insurance Project and Paddy Mortgage Project; and to compare attitudes of farmers living in Pranakhon Si Ayutthaya province towards effectiveness of each scheme. A multi-stage sampling technique was used to select the participants in the districts and sub-districts recommended by Community Developers. While villages were chosen by random sampling method, the 100 samples were selected by accidental sampling method. The data analysis was done using weighed Pairs of Sample T-Tests. The results indicated that the average return of the Paddy Mortgage Project was 103% higher than that of the Paddy Price Insurance Project, resulting in the higher living standard for those participated in the Paddy Mortgage Project because the price of rice was 38% higher. However, the cost of rice cultivation during the Paddy Mortgage Project was 8.53% higher than that of the Paddy Price Insurance Project. Land lease was a significant expenditure leading to higher production costs during the Paddy Mortgage Project. The study also revealed that most of the participated farmers considered both projects good because they both increased the standard price of rice. The research suggested that the government should implement the Paddy Mortgage Project together with a policy to control the price of production factors at an appropriate level and promote rice-production efficiency methods.

Keywords: Paddy Price Insurance, Paddy Mortgage, Living Standard, Farmer

Introduction

Rice has been part of most poor people's way of life around the world; 70% of them living in Asia where 90% of global rice production and consumption takes place. The fact that global rice market has been tremendously distorted, partly because of the high degree of intervention in the richest countries in East Asia (Japan and Korea), Europe and the United States heavily subsidize their rice production (World Bank, n.d.). The rice price intervention aiming to increase the farmer's income has been evident in many Asian countries (FAO, 2014).

Rice is the most important agricultural product in Thailand. With the uncertainties of price level and production volume, they have led to problems of poverty and income distribution. The Constitution of the Kingdom of Thailand stipulates that the government must support free economic system through market mechanism. However, in practice, they have to solve the low agricultural product price problems with the rice price intervention schemes to prevent adverse impacts on farmers who are the majority of the country. The Paddy Price Insurance Project and the Paddy Mortgage Project were the two most important policies implemented during the past periods.

The Paddy Mortgage Project was initially introduced during 1981/1982 rice production season. The government stipulated that the project was an additional mission of the Bank for Agriculture and Agricultural Cooperatives (BAAC) to persuade farmers to delay their paddy selling at the beginning of the year. Later, during the 1986/1987-2000/2001 production seasons, there was a significant change to the Paddy Mortgage Project as the government took over the project, and the Bank of Thailand was instructed to provide loans to the farmers. In the 2000/2001 production season, rice millers were authorized to issue the warehouse receipts in the paddy mortgage

process under the supervision of the Marketing Organization for Farmers (MOF) and the Public Warehouse Organization (PWO). Then, the warehouse receipt would be deposited with BAAC who gradually increased the mortgage target. As a result, the value of the mortgage during the 2004/2005 and 2005/2006 production season had increased from 12,429 million baht to 71,773 million baht, and the prices of the paddy under the project was also increased (Duangbootsee, 2013). However, during the 2004/2005 to 2008/2009 production season, the government experienced the loss of over 63,232 million baht (Prachachat Online, 2011).

The government, then, changed its policy to the Paddy Price Insurance Project during the 2009/2010 to 2010/2011 production season through the announcement of the reference market price which appropriately covered at least 20-25% of the farmer's production cost. Upon the drop of the market price lower than the reference price, the government was obliged to pay the differences. During the 2009/2010 production season, the total compensation for the differences was made at 28,380 million baht. However, in 2010/2011 production season, farmers received only 4.44% increased in their return (Viyachai, Onrit and Viyachai, 2014). The registered rice plantation areas were 67 million rai, while there were only 57 million rai verified by the aerial survey, a huge 10-million-rai gap. This had caused the government in great budget loss of 113,860.80 million baht (Prachachat Online, 2011).

Later, the Paddy Price Insurance Project was transformed to the Paddy Mortgage Project in 2011/2012 and 2012/2013 production season, which was different from the previous Paddy Mortgage Project where it accepted only the partial mortgage following the quota method. The new project promised to accept the mortgage for every grain of rice and there were 21.76 million tons of rice in total, accounting for 52% of the total rice production. The farmers who entered the project received the benefit of 126,471 million baht from the mortgage price which was higher than the market price, leading to the government loss of 170,313.53 million baht (Poapongsakorn et al., 2013).

This price intervention policy had caused a huge controversy concerning the selection appropriateness of the Paddy Price Insurance Project and the Paddy Mortgage Project. On one hand, the Paddy Mortgage Project received much of the criticisms concerning the corruption and the distortion of market mechanism. On the other hand, the effort to use the Paddy Price Insurance Project was to solve the corruption problem without distorting the market. Nonetheless, in the past 20 years, the benefit received by the farmers was less than 50% of the total budget spendings on those schemes. Both projects have caused the increase of rice cultivation areas rather than the efficiency of the rice production. During the 1988-1997 and 1998-2012 production season, the rice plantation areas had increased up to 15 million rai (NaRanong, 2012).

From the literature review, most researchers studied total benefits received by the farmers and losses caused by budget utilization in each project. The study comparing the projects on economic impacts on households, which are considered as a success index of the paddy price intervention, did not exist. Thus, this research aimed to compare the economic impacts of the Paddy Price Insurance Policy and the Paddy Mortgage Policy on their effectiveness to enhance Thai farmers' living standard. This study compared the economic return under each policy using income, product price, total cost, fixed cost, (i.e. lease, depreciation, and interest), and variable cost (i.e. rice seed, labor, petrol, fertilizer, and pest control). The outcome should provide solutions concerning the improvement of farmer's quality of life in Sena District, Phranakhon Si Ayutthaya Province and other provinces where most of the farmers are the rice farmers.

Definitions

1. Paddy Price Insurance refers to the stipulation of the rice reference price at a suitable level to maintain farmer's living standard during the 2010/2011 production season. When the market price should be lower than the stipulated reference price, the government would have to pay the differences to the farmers so that they earned the same amount as the set reference price (Isvilanonda, 2010).

2. Paddy Mortgage refers to the paddy mortgage during the 2012/2013 production season. The government guaranteed the higher price of all white rice at 15,000 baht and Hom Mali rice at 20,000 baht per cart (Wanvisate, 2011).

3. Living standard refers to farmer's level of wealth and comfort received from basic facilities appropriate to their status. (Wikipedia, 2018)

4. Farmer refers to a person who make a living by planting, raising animals, and fishery (Office of the Royal Society, 2010). However, in this research, it refers to a person who does the rice cultivation.

Research Methodology

This applied research used primary data from the 2010/2011 and 2012/2013 production seasons, where the government used the Paddy Price Insurance and the Paddy Mortgage Policies respectively. Population and sample groups, analytical tool, data collection method, and statistics used in this research are as follows:

1. Population and Sample Groups

The population were rice farmers from totaling 3,609 households from Sena District in Phranakhon Si Ayutthaya Province. The sample size was determined using Taro Yamane Formula at 95% confidence level (Ritcharoon, 2008), resulting in 98 households. The total sample size was 100 households. The sampling was done at four stages. Firstly, Sena District, as advised by Community Developers, was purposively chosen because it is the biggest rice cultivation district in Phranakhon Si Ayutthaya Province. Secondly, seven sub-districts, chosen with the Purposive Sampling method, were Chao Jed, Sam Kor, Hua Wiang, Ban Kratoom, Chai Na, Sam Toom, and Ban Luang. Thirdly, the villages were selected using the Simple Random Sampling method. Lastly, the individual farmers were chosen using the Accidental Sampling method.

2. Research Instrument

A questionnaire consisting of five parts was used for analysis. They composed of personal information (eight questions), rice cultivation information (seven questions), costs of rice cultivation (20 questions), production returns (five questions), and farmer's attitude toward the participation in the Paddy Price Insurance and Paddy Mortgage Projects which were the open-ended questions (two questions). The questionnaire assessment and quality examination were conducted by two subject experts. The testing of interview and information filling was done to improve the quality of the tool. Then the questionnaire was adjusted until it was well qualified.

3. Data Collection

The data was collected using verbal interview and recorded in writing. The process started with contacting each village head for advice, making an appointment with farmers prior to visiting the areas, then supporting the research assistants by conducting an interview training, identifying possible problems and difficulties, and providing them the operational guidelines. The data collection was conducted in June 2014, followed by data verification, comparison, and accuracy improvement.

4. Statistics

The objectives of this research were:

1. To compare the rice cultivation return and cost under the Paddy Price Insurance and the Paddy Mortgage Projects using two scenarios - at the market price and at the base year price or reference price which was the average price of the year 2012-2013

2. To compare the attitude of farmers participating in the Paddy Price Insurance and the Paddy Mortgage Projects toward the level of their living standard

The cost of rice cultivation consisted of explicit cost (actual expenses) and opportunity cost (not actual expenses). The Pair Sample T-Test method was used to compare the differences between the average values of the dependent samplings.

The study chose the sampling areas in stages 1 and 2 using the Purposive Sampling method whereas the individual farmerss was chosen using the Accidental Sampling method. The sampling groups were not randomly acquired, resulting in the possibility of result distortion. In order to make the sampling groups the justified representation of the population, weighted data was used by multiplying two sections First, the proportion of household numbers in sub-districts and the household numbers of the sampling farmers. Secondly, the proportion of farmer's household numbers in the districts and farmer's household numbers in the sub-districts.

The average return (Baht/rai) was calculated from the differences between the average income and the average cost at the market price. The average income was calculated by multiplying the rice price (baht/cart/season) and the average rice production volume (cart/rai/season). The average cost of rice plantation was the economic cost equivalent to the sum of the average fixed costs and the average variable costs. The average fixed cost consisted of the average land lease cost, depreciation of tractors, pedestrian controlled tractor, combine harvester, lawn mower, water-pump, pipe, fertilizer/rice spreader, pest control sprayer, as well as loan interest, and maintenance of rice cultivation tools, equipment and machine. The average variable costs consisted of total service contract fees for the first and second plowing, harvesting and delivery; labor cost for water pumping, soil preparation, rice planting, applying fertilizer, pest control and insecticides, harvesting, delivery, and all household labors of any cases; raw material cost, namely, rice seeds, fertilizer, and pest control and insecticides or herbicide; and petrol cost, namely, petrol for water pumping and soil preparation.

Table 1 Consumer Price Index (CPI) at 2011 base year price

Year	Headline CPI
2009	93.30
2010	96.33
2011	100.00
2012	103.02
2013	105.27
2014	107.32

Source: Calculated from Bank of Thailand's data (2012; 2014)

The return and cost of rice cultivation under the Paddy Price Insurance and the Paddy Mortgage Projects in the 2010/2011 rice production season was adjusted to the average price of 2012-2013 as the base year price (Table 1) by multiplying the data at the market price by the average 2011 and 2012 Consumer Price Index (CPI). The

farmer's attitude toward their participation in the Paddy Price Insurance and the Paddy Mortgage Projects was studied using descriptive research method through percentage statistics.

Results and Discussion

In Sena District, Phranakhon Si Ayutthaya Province, without weighing the data, 58 farmer samples did chemical rice farming, while the other 29 did the integrated rice farming, seven did the chemical and integrated rice farming, and six of them did the chemical and organic rice farming. The study, with weighted data, showed that most farmers were male, aged between 57-68 years old with rice farming experience between 31-40 years, and their education at primary school level by group accounted for 73.4%, 38.3%, 26.0%, and 56.6%, respectively. The average household size was 4.95, consisting of 4.00 adults, and 2.10 assisting in farming. Most of them had no other sources of income, while some earned from laboring, other sources, and trading which accounted for 40.8%, 17.9%, 16.8%, and 15.2%, respectively. The farmers with other sources of income, apart from rice cultivation, most of their incomes came from gardening and orcharding which generated 83,410.42 baht/person/year.

Most of the farmers owned their lands and leased some for rice cultivation (41.8%), while some had to lease the whole land (34.5%). Most of them had their agricultural lands in the irrigation areas (87.8%), practiced off-season rice farming (98.3%), and flood-based farming (94.5%). They used agrochemicals (56.2%), practiced integrated rice farming (41.0%), and most of them did the rice cultivation mainly for selling (99.0%). The average land size per household was 48 rai, most of them had the paddy areas of 20-39 rai, and 46.8% participated in the Paddy Price Insurance Project and 47.7% participated in the Paddy Mortgage Project. There were no differences in the amount of rice grain used per rai. The average use was 26.15 kg per rai, while the majority of the farmers (48.3%) used 25 kg per rai. In rice cultivation management, the study found that most farmers pumped the water (87.0%), planting rice (70.8%), preparing soil (57.0%), and applying fertilizer (43.6%) by themselves. The processes which mostly engaged with labor hiring were harvesting (97.9%) and applying pest control (63.6%). For the post-harvest management of the lands and products, the study revealed that most farmers chose to burn the rice stubble (89.6%) resulting in no expenses, while only 10.4% chose to plow the lands. After the harvest, most of them sold their rice to the mill (96.5%) and hired someone to deliver the rice to the mill (91.3%) with the average delivery cost of 165.94 baht/ton.

Table 2 Comparison of farmer's return and cost of rice cultivation under the Paddy Price Insurance Project in the 2010/2011 production season and the Paddy Price Insurance Project in the 2012/2013 production season at the market price and the average 2012-2013 base year price

Items	Market Price		Base Year Price		% Difference	
	Price Insurance	Mortgage	Price Insurance	Mortgage	Market Price	Base Year Price
Return	2,778.16	6,057.47*	2,978.67	6,057.47*	118.04	103.36
Income (Baht/Rai)	7,305.72	11,325.74*	7,833.00	11,325.74*	55.03	44.59
Rice Price (Cart)	8,218.71	12,214.83*	8,811.89	12,214.83*	48.62	38.62
Productivity (Cart)	0.8932	0.9287*	0.8932	0.9287*	3.97	3.97
Total Cost (Baht/Rai)	4,527.56	5,268.28*	4,854.33	5,268.28*	16.36	8.53
Fixed Cost	1,246.87	1,568.68*	1,332.69	1,568.68*	25.81	17.71
Lease Cost	597.71	896.67*	640.85	896.67*	50.02	39.92

Table 2 (Cont.)

Items	Market Price		Base Year Price		% Difference	
	Price Insurance	Mortgage	Price Insurance	Mortgage	Market Price	Base Year Price
Depreciation	342.55*	342.06	367.28*	342.06	-0.14	-6.87
Interest	302.72	325.79*	324.57	325.79*	7.62	0.38
Variable Cost	3,280.68	3,699.60*	3,517.46	3,699.60*	12.77	5.18
Rice Seeds	479.65	535.61*	514.27	535.61*	11.67	4.15
Labor	1,245.47	1,433.74*	1,335.36	1,433.74*	15.12	7.37
Petrol	476.15	494.29*	510.52	494.29*	3.81	-3.18
Fertilizer	753.08	873.38*	807.43	873.38*	15.97	8.17
Pest Control	326.33	362.57*	349.89	362.57*	11.11	3.62

Source: Calculation from questionnaire

Remarks: * = Statistical significance at the confidence level of 0.01

*** = Statistical significance at the confidence level of 0.10

ns = Not significance

1. Comparison of the return and cost of rice cultivation under the Paddy Price Insurance and the Paddy Mortgage Projects

The comparison of the economic impacts of the Paddy Price Insurance and the Paddy Mortgage Projects indicated that the Nominal returns, income, rice price, average product, total cost, fixed cost, and variable cost under the Paddy Mortgage Project were significantly higher than those of the Paddy Price Insurance Project at the confidence level of 0.01 (Table 2).

Despite the return of rice cultivation at the market price which showed that the farmers received higher return and price from the Paddy Mortgage Project than those of the Paddy Price Insurance Project, there were some misleads due to the depreciated value of money. Therefore, it cannot be explicitly indicated how much the return from the Paddy Mortgage Project were higher than those of the Paddy Price Insurance Project.

Table 3 Comparison of the farmer's estimated return and cost of rice cultivation during the periods of the Paddy Price Insurance Project in the 2010/2011 production season and the Paddy Price Insurance Project in the 2012/2013 production season at the market price and the base year price

(Unit: Baht/Rai)

Items	Market Price		Base Year Price		% Difference	
	Return		Total Cost		Return	Total Cost
Farmer's Estimation	Price Insurance	Mortgage	Price Insurance	Mortgage	Market Price	Base Year Price
Farmer's Estimation	2,427.75	6,100.31	5,919.89	5,964.09	151.27	0.75
Market Price	2,778.16	6,057.47	4,527.56	5,268.28	118.04	16.36
2012-2013 Base Year Price	2,978.67	6,057.47	4,854.33	5,268.28	103.36	8.53

Source: Calculation from questionnaire

It is more appropriate to compare the return and the cost of rice cultivation under both schemes using the average 2012-2013 base year price. The outcome was in line with the previous section which concluded that the return of rice cultivation under the Paddy Mortgage Project was higher than that of the Paddy Price Insurance

Project (Table 2). It can be implied that the farmers under the Paddy Mortgage Project had better living standard as a result of higher income and return. This outcome was in line with the past studies which indicated that the Paddy Price Insurance Project increased farmer's return by only 4.44% (Viyachai, Onrit and Viyachai, 2014), while the Paddy Mortgage Project averagely increased the return 3,969 baht/household (Masang, 1994). The income and rice price received under the Paddy Mortgage Project were also higher than those of the Paddy Mortgage Project. However, the farmers estimated that they would get their average return under the Paddy Mortgage Project higher than that of the Paddy Price Insurance Project by 151.27% which was much higher than that of the research outcome (Table 3).

Regarding production costs, the farmers experienced no cost differences between the two projects. However, the research showed that the average cost, land lease cost, and variable cost under the Paddy Mortgage Project were higher (Table 2). In addition, the cost of fertilizer, labor, rice seeds, and pest control chemicals were the major expenses, which made the variable cost of the Paddy Mortgage Project higher. The result was in line with the economic theories and conformed to the past findings revealing that the Paddy Mortgage Project had increased the rice price, resulting in farmer's expansion of rice plantation areas and the increase of rice cultivation cost, namely, lease, labor, fertilizer, herbicide, and pest control (Econ Hermit, 2012; Poapongsakorn et al., 2013). In contrast, the Paddy Price Insurance Project had led to farmers' expansion of rice plantation area which caused the drop of rice price at the market price (Duangbootsee, 2013).

Table 4 Farmers' attitudes toward the Paddy Price Insurance Project in the 2010/2011 production season and the Paddy Mortgage Project in the 2012/2013 production season

Items	No. of Farmers	Percentage
Paddy Mortgage Project is much better	12	0.3
Paddy Mortgage Project is better	1,801	49.5
The 2 projects are equally good	449	12.4
Paddy Price Insurance is better	293	8.1
No Comment	1,054	29.2
Total	**3,609**	**100.0**

Source: Calculation from questionnaire

Table 5 Farmer's satisfaction toward the Paddy Price Insurance Project in the 2010/2011 production season and the Paddy Mortgage Project in the 2012/2013 production season

(Unit: %)

Item	Paddy Price Insurance Project	Paddy Mortgage Project
Very Good	**-**	**8.8**
High Price	-	60.8
Good Return	-	39.2
Good	**57.8**	**81.8**
Advantages		
High Price	62.7	72.0
Instant Acknowledgement of Price	-	0.4
Instant Payment	14.6	-
Direct Payment	0.6	-
Increase of Return/Income	10.4	8.8
Receiving Equal Return	0.6	8.4

Table 5 (Cont.)

(Unit: %)

Item	Paddy Price Insurance Project	Paddy Mortgage Project
Fair	1.7	1.5
Disadvantages		
Low Price	5.0	-
High Cost	-	1.1
Delay of Payment	1.1	-
All benefits are not received	0.6	-
Landlords ask for sharing or keep the payment	0.6	-
Too many processes	2.1	5.7
Not Good	**42.2**	**8.8**
Advantages		
High Price	-	26.3
Receive Direct Benefits	-	13.2
Disadvantages		
Low Price	47.0	-
High Cost	2.9	-
Delay of Payment	8.2	36.8
Small Return	4.7	-
Quota Limitation	4.6	-
Loss	0.8	-
All benefits are not received	13.8	3.6
Landlords ask for sharing or keep the payment	15.6	-
Corruption at every process	1.6	3.6
Too many processes	0.8	9.4
No Comment	-	7.1

Source: Calculation from questionnaire

2. Farmers' attitudes in participating in the Paddy Price Insurance and the Paddy Mortgage Projects towards their living standards

The farmer's attitude survey under the two schemes revealed that most of the farmers thought that the Paddy Mortgage Project was better (Table 4), followed by the impression of the second largest group that both projects were equally good, and only a few thought that the Paddy Price Insurance Project was better. This outcome was in line with the results of the previous studies indicating that 86% of the rice farmers were satisfied with the Paddy Mortgage Project (Maejo Poll, 2012), as well as with the Paddy Price Insurance Project (Suwanno, 2011). Given the two projects set the same level of price, the farmers would have had similar satisfaction for each project (Duangbootsee, 2013). Most of the farmers expressed that the two projects were good projects (Table 5) because they had increased the rice price and return from rice cultivation. Some of them opined that the Paddy Price Insurance Project was a good project because it provided an instant payment to the farmers. Some of them felt that the Paddy Mortgage Project was 'good' and 'as good as' the Paddy Price Insurance Project. The group seeing the Paddy Price Insurance Project 'not good' gave the reason for its lower price, while the group seeing the Paddy Mortgage Project 'not good' encountered the delayed payment. However, there were some farmers seeing the Paddy Mortgage Project 'very good' because of its high price and return.

Conclusion

Although the rice intervention policies received much of controversial criticism regarding its advantages and disadvantages, whether which policy is more appropriate, those policies are still necessary to enhance the farmers' living standard. As the analysis result suggests that the Paddy Mortgage Policy provided more economic return, it was confirmed that this policy was a good one, which contributed to the better enhancement of the farmers' living standard. Taken into the consideration, the mortgage price was higher than the insured price in spite of the higher cost of rice cultivation, partially due to steep land lease increment. In addition, the rise of variable cost was derived from the increase of the fertilizer and labor cost.

Nonetheless, the farmers overestimated the effect of the Paddy Mortgage Project to their living standard over the Paddy Price Insurance Project. Most of them believed that the Paddy Mortgage Project was much better because of the higher mortgage price, without realizing that the inflation had caused the rise of their production cost, and the resource owners had taken advantages by increasing the price of production factors. The strengths of the two projects were the increase of the price and return of the rice cultivation. The Paddy Price Insurance Project featured the instant payment though lower price, while the weakness of the Paddy Mortgage Project was the delayed payment.

Recommendations

1. Policy Recommendation

The government should implement the Paddy Mortgage Project to enhance the rice farmers' living standard with measures to control the resource owners who inappropriately taking advantages by increasing the price of resources such as land lease, fertilizer, pest control chemicals, labor, and so on. In addition, the government should transfer the knowledge to increase the rice productivity, as well as provide information about positive and negative economic impacts of the Paddy Price Insurance and the Paddy Mortgage Projects to the rice farmers which would enable them to understand these policies better.

2. Research Recommendation

The suggested future research includes a comparison of impacts under the Paddy Price Insurance Project and the Paddy Mortgage Project on rice production efficiency, and on farmer's poverty and income distribution.

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