

## Ways of Reducing Rice Growing Cost and Enhance Rice Farmer's Sustainable Economic Strength in Nakhon Ratchasima Province

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—Review of—  
**Integrative  
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—Research—

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### ABSTRACT

Results of the study 1) concerning the rice growing process, the field used for rice growing is flat with some sands, and rice growing is done annually. Seed sowing is the way of growing rice; the farmers use their own rice grains for growing. Lacking of water before the sowing of rice is the problem at the beginning of the rice growing season. The soil has to be prepared before growing rice. Natural fresh vegetation is used as fertilizer. Chemicals are used for rice diseases and harmful insects. Rice harvesting machine is used for harvesting rice. Farmers normally sell their rice to the middle man merchants or the rice mill within the district. 2) Transferring knowledge for rice growing and experience for keeping record of family expenditure and income are encouraged. Farmers are chosen to take part in the training activities. They are trained to keep records of family earning and expenditure in order to gain experience of how to keep records. Concerning the production cost and the profit gained, it was found that farmers spent most of their expenditure on chemical fertilizers, cost of harvesting, plowing land, insecticides respectively and the searching for model farmers in order to train for technology in rice growing to reduce the cost of growing rice. 3) Reducing the rice growing cost should be done through the farmers' collaboration in Nakhon Ratchasima by reducing the use of chemicals in rice growing, which should be suggested as follow: 1. raising pigs in restricted area to get pig waste as natural fertilizer in place of chemical fertilizers. 2. Use natural fertilizers 3) use chemical fertilizers correctly. To reduce the harvest cost, it is suggested that 1) community labor turn-taking is used for harvesting 2) creating famers' power to reduce harvesting cost with the rice harvesting machine owners. To reduce of cost of plowing, it is suggested that farmers should prepare their own rice paddy plot for growing young rice plants to reduce the cost. Use rice straw left in the field as natural fertilizers instead of burning it and to reduce the use of chemicals. To reduce the cost of chemical fertilizers, use fish heads to make natural liquid fertilizer 2) use appropriate type of rice seeds for growing 3) use as less chemicals as possible.

Keywords: Cost, Family Expenditure and Income Record Account, Strengthening Farmers' Economic Stability

### 1. BACKGROUND AND THE SIGNIFICANCE OF THE PROBLEMS

Rice is regarded as an important agricultural economic crop, which has enhanced Thailand economic prosperity for such a long time and it is also a main food source of

world population's living. Rice provides not only a source of human energy but also healthful nutrition for our bodies providing important nutrients such as carbohydrate, protein, fats, vitamin, and minerals including and anti-oxidants.

In 2014 and 2015, Thailand has got an area of about 60.54 million rai (Thai unit of land measurement) which is equal to approximately 30 million acres for planting rice during rainy season and about 8.49 million rai for planting rice during the dry season. The amount of rice harvest for both rainy season and dry season are 26.05 million tons and 5.37 million tons respectively (quoted from Agricultural economic bureau 2015) Five top rice world exporters are India, Thailand, Vietnam, Pakistan, and USA. The volumes of polished rice grains exported by these countries are as followed 10.23, 9.79, 6.61, 3.91 and 3.61 respectively. (Thai rice exporters association, 2016)

The problem concerning Thai rice production is the competitive ability with other countries in Southeast Asia as compared to the country group of CLMV- Cambodia, Laos, Myanmar and Vietnam, of which these countries have lower cost of rice growing and they have continuously increased the proportion of the rice market, particularly Vietnam as the price of Thai rice increases higher every year.

Concerning the rice market in Southeast Asia, it is undeniable to say that Thailand has lost much of her rice market to Vietnam in recent years and some to Cambodia, Myanmar and Laos. The only problem for Thai rice is that the cost of rice production is higher than our rice growing neighbors but also the yield of rice per rai is lower than other competitors in Southeast Asia. These problems have direct effect on the efficiency of Thai rice exporting in Southeast Asian market.

Moreover, as far as the internal country situation is concerned, there are shortcomings with the cultivating land and the technology for rice growing, the deteriorated of the production resource, the change of the climate, and the disaster caused by the nature. All these problems result in the higher cost of rice production, the sale of the produce, and insufficient income, leading to debt.

As a result of all these problems, it is necessary that research must be conducted to find out ways of reducing the rice growing costs that would lead to the development of rice market in Nakhon Ratchasima in order to enhance competitive efficiency and to promote the sustainable development of rice business. Thus, this study aims to study the process of rice production, knowledge management, and experience gained from keeping family expenditure and earning record, inclusively the production cost and the profit gained and the ways of reducing cost of rice production by applying the farmers' participation of farmers in Nakhon Ratchasima. It is hoped that results from the study will not only be beneficial to rice growers but also to strengthen the farmers' capability to compete better in the rice business industry.

## **2. RESEARCH RESULTS**

### **Part 1 General Information of the Study and General Facts Concerning Farmers' Rice Growing in Nakhon Ratchasima**

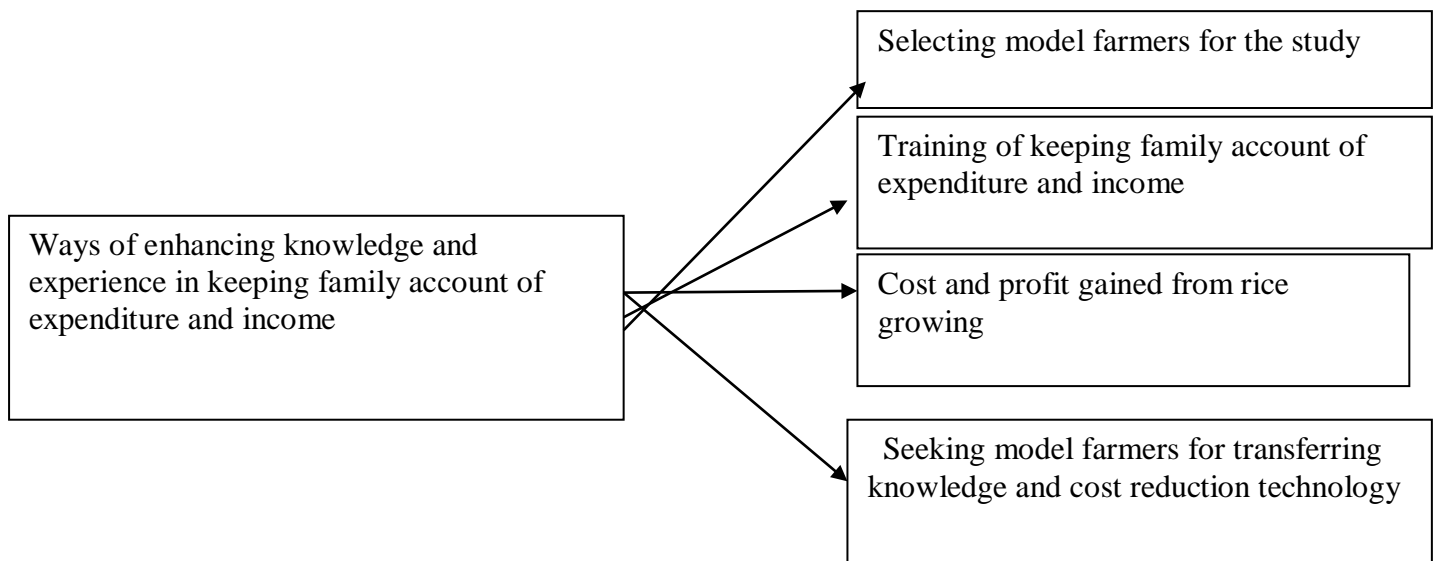
Based on the study of general facts about rice farmers in Nakhon Ratchasima, it was found that 73.33 of the rice farmers are women with the average age of 53.57 years . 43.81 % of them completed their compulsory education (grade 6). The average number of the family members is 4.35 and they own about 17.35 rai per family and the average size of the rented farm land is 19.4 rai. They have average experience of rice growing for 33 years. Jasmine rice is the only kind of rice grown in their paddy fields.

Their total agricultural annual income was approximately 53,397.56 baht per year. 45,661.58 of the overall annual income came from rice and 68,000 baht came from tapioca and 24,175.61 baht came from other farm produces they grow. 17,600 baht came from vegetable growing and 24,415.38 baht came from livestock and 41,728.57 baht came from non-agricultural produce. It could be concluded that 7.24 % of the farmers got the bank loan and the average amount of loan was 64,226.67 baht. 37.62 % of the farmers got their loan from the Agriculture and Cooperative Bank. They own mini-trucks for transporting rice to the market. 80.95% of the farmers have their own tractors. 68% of the farmers have the insecticide spray device.

Concerning the rice production of farmers in Nakhon Ratchasima, it can be concluded that the field used for rice growing is flat and the composition of the soil is sandy mold. Rice growing is planted annually. The farmers use their own rice seeds for rice growing. Rain water is the main water resource for growing rice, so they have the problem with the lack of water at the beginning of the rice growing season and also the rice blooming time. 72.86% of the farmers use fresh fertilizers (i.e. weeds from the field) for preparing plots before growing rice. 91.44% of the farmers use fertilizer in growing rice. 90.48 % of the farmers use insecticide chemicals for protecting the rice from rice diseases and 80.92% of the farmers use chemicals to get rid of weeds. 85.72 % of the farmers use chemicals for preventing and killing insects. 92.38 % of the farmers hire rice harvesting machine for harvesting and 61.43% of the farmers sell their rice to the rice merchant or to the rice mill within the district.

Samples of research population were 15,019 rice farmers' family in Nonsung District. The samples were specifically selected from rice farmers in 3 sub-districts in Nonsung District of Nakhon Ratchasima - Lamkorhong, Ping, and Lammool Sub-districts. Data were collected from 70 families from each Sub-district. The numbers of data collected samples were 210 families.

## **Part 2 Enhancing Knowledge and Experience of Keeping Family Account of Expenditure and Income and Study of Cost and Profit Gained for Farmers Who Kept Family Expenditure and Income Account in the Area of Nakhon Ratchasima**



**Table 2** Analysis of Rice Growing Cost of Rice Farmers in Nakhon Ratchasima Classified according to Different Types of Rice Growing Activities

5 Top Costs of Rice growing	Baht/Rai	Percentage
Fertilizers	667.44	34.25
harvesting crop	550	28.22
Plowing for soil rice planting reparation	240	12.32
Plowing for soil preparation before seed sowing	200	10.26
Chemicals	80.23	4.12
Harvest crop	398.54	kg/rai
Total income	4,184.67	baht/rai
Overall cost	1,948.79	baht/rai
Profit Gain	2,235.88	baht/rai

The problems concerning family financial record keeping were illiteracy, poor eyesight, lack of time, inability to understand how to keep family financial account, paying no attention to the importance of keeping family financial account. Authorities did not supervise the record keeping of farmers' financial account and also discontinuation of keeping family financial account regularly.

### **Part 3 The Study of Rice Growing Cost Reduction of Rice Farmers in Nakhon Ratchasima by Using Collaborative Process**

To do this, there must be a meeting of those people who are involved in the issue in order to suggest ideas in reducing rice growing cost with the collaborative process among the farmers and other relevant partners. It can be concluded like this.

Table 3 Ways of Reducing Cost

Rice Growing Cost	Ways of Reducing Cost
Chemical Fertilizer Cost	-Raising Pigs in grounded pens -Use of Biological Fertilizer -Correct use of Chemical Fertilizer
Crop Harvesting Cost	-Turn-taking of Use Community Labor for Rice Harvest -Create United Group to negotiate with the Rice Price
Field Plowing Preparation for Rice Planting Cost	-Farmers should do the first plowing to reduce cost by themselves. -Use the rice straw as natural fertilizer to save cost.
Use of Chemical Cost	-Use fish heads to make liquid fertilizer -Use appropriate seeds for planting -Reduce use of chemicals as much as possible

#### Discussion of Result

Most of the farmers answering the questionnaires are housewives who have the compulsory educational background (Grade 6). Most of them are middle- aged up to old age. This reflects the farmers' labor aspect involving in rice growing production, while most of the younger generation go to find job apart from rice growing in other places. If this situation continues, the farmer labor will definitely decrease. As a result, rice growing has to depend on using machine for the rice growing production because of the insufficient farming labor. Thus, it is unavoidable that the cost of rice growing will continue to increase due to the use of the machine. Since most of the Northeastern farmers are poor and lack of farming land of their own and most of the rice growing fields are rented; therefore, the farmers lack incentive in growing rice. Another problem is that farmers could produce less amount of rice crop with the high price of cost for rice growing. These problems definitely affect the family income.

From the study of the rice growing of farmers in Nakhon Ratchasima, it was found that the soil where the rice is grown is sandy mold and the rice growing is the annual rice growing and the planting method is the sowing. Because rice growing field is located outside the irrigational system, there is a lack of water resource so the farmers have to depend on the rain. The source of rice grains for planting is from the farmers themselves. Most of the farmers grow jasmine rice. This is relevant to the study of Orawan Srisombhodi (2514) who studied the structure of the rice production and the jasmine rice market. There has been tendency for Northeastern farmers to grow more jasmine rice due to the high price of the rice since there is a demand for jasmine rice. There is a policy of rice price insurance. It is also found that most farmers use chemical fertilizer for rice growing. 91.44% of the farmers use chemicals for protecting rice from rice diseases, weeds, and insects. 90.48, 80.92 and 85.72 % use chemicals for protecting and harvesting respectively. 92.38 % of the farmers use only rice harvesting machine. To summarize, more than 80% of the farmers use chemicals and machine in the process of growing rice. This is a very high proportion of rice growing.

As far as the rice growing cost and the profit gained based on the record of family expenditure and income s concerned, it was found that rice growing cost can be classified according to rice production activities as followed- total cost of rice production is 1,948.79 baht per rai, rice production yield of 398.54 kilograms per rai, overall income of 4,184.67 baht per rai and profit gain of 2,235.88 baht per rai. Rice production cost was calculated from the cash that was spent by the farmers for rice growing as recorded in the family expenditure and income account. This excluded other costs that are non-cash payment such as the farmers' labor used in growing rice, the rent of their own rice field, rice grains for growing and other expenditure concerning rice growing, which is the economic cost. To train farmers to keep records of expenditure and income, farmers need to be enhanced with knowledge and experience and the training can be put into 4 stages: 1) selecting farmers for training, 2) arranging activities for keeping family expenditure and income record, 3) study of family's rice growing costs and profit gained from rice growing and 4) searching for model farmers to teach and transfer knowledge and technology for cost reduction in rice growing.

With reference to the problem of keeping family account of expenditure and income record, it was found that the farmers cannot read or write. They have poor eyesight and do not have time for keeping the family financial record. Furthermore, they do not understand how to keep the family expenditure and income record regularly and the bank personnel did not follow up and supervise them. This problem is both relevant and not relevant to the study of Supanee Tonrub (2008) who studied the family record account of expenditure and income of the famers who were the customers of Chiangmai Agricultural and Cooperative Bank. The relevant part is that the farmers did not have the knowledge and understanding of how to keep the record and keeping the family financial account was complicated for them and also it was a waste of time. In addition, there was a lack of bank adviser to help them with the keeping of family financial record which is the serious problem for the farmers.

With respect to the adaptation of technology for rice growing cost reduction and strengthening of farmers' collaboration in Nakhon Ratchasima, our result of study is found to be in accordance with Weerawat Homejumjung and Yaowarat Sriwaranun (2014) who studied the farmers' adaptation of rice growing cost reduction and found that the adaptation of rice growing cost reduction was to reduce the following rice production costs. They were to use fertilizers as suggested by fertilizer specialist and reduced the use of chemical fertilizer and use natural organic fertilizers and liquid organic fertilizers, instead. In their study, they also used family expenditure and income record account as a tool for the study of the cost of rice growing and found that the highest cost was the use of chemical fertilizers. Thus it was suggested that lowering the rice production cost was to buy chemical fertilizers from their own community and to raise pigs for their waste to use as fertilizers in place of chemical fertilizers. They should use biological fertilizers and use chemical fertilizers wisely. Since organic farmer groups was established, and they had the problem with poor soil for a long time, and the community wanted to reduce the use of chemicals or to use less chemical fertilizers because the long repetitive use of chemical fertilizers causes to the poor soil. Moreover, it leads to higher cost of rice growing production.

Another expenditure that causes higher cost of rice production is expenditure from hiring rice harvesting machine. To reduce this cost, it is to use collaborative community labor

by turn-taking the community labor in harvesting in each other fields and to form groups to gain power for price negotiation. The other expenditure that causes higher cost of rice growing is the use of chemical fertilizers. This can be solved by using natural liquid fertilizer made from fish heads as the neighboring area makes Pla Ra (preserved fish in brine - Northeastern style of food preservation) Fish heads are cut off before preservation. Thus, it is useful to make use of the fish heads to make fertilizers. Moreover, the farmers can reduce the use of chemical fertilizer. This also reduces cost of rice production.

### 3. SUGGESTION FOR FURTHER STUDY

1.The researcher would like to suggest that research for the same objective to be carried out in other bigger districts of rice growing in Nakhon Ratchasima such as Phimai District, Kong District and Nongboonmak District so that findings about the rice growing cost, the profit gain and ways of reducing rice growing cost be more complete and cover other districts in Nakhon Ratchasima.

2.The study should focus on the process of rice production from the beginning to the end in order to get finding results as the information base for the development of economic production and rice market in Nakhon Ratchasima.

3. It is also suggested that technology, innovation and creative ideas be developed and promoted to enhance the process of rice growing production, marketing, and produce other forms of rice produce as to strengthen Thai farmers' competitive ability in the neighboring area.

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