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Farmer's Satisfactions of KDML 105 Rice Production by Good Agricultural Practice in Mahasarakham Province

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Abstract The purpose of this research was to study the farmer's satisfactions of KDML 105 rice production by Good Agricultural Practice of farmers in Maha Sarakham province. The population in this research was 120 farmers. Data were collected through structured questionnaire interview. Data analyzed by using frequency, percentage, mean and standard deviation. The results of the study revealed that the majority of the farmers was male, the average age was 54 years old, education was elementary school, the average household members was 4 persons. An average experience of GAP KDML 105 rice planting was 1.3 years. The average of GAP KDML 105 rice planting area and total yields were 6.5 rai and 374.4 kg./rai, respectively. The results showed that overall of farmer's satisfactions of KDML 105 rice production by Good Agricultural Practice in Mahasarakham province agreed high level. When comparing the farmer's satisfactions on GAP KDML 105 rice production by education level significant differences was detected in some contents.

Keywords: Satisfactions, Good Agricultural Practices (GAP), KDML 105 rice production

Introduction

Rice is a major economic crop in Thailand, with high production potential, the environment is suitable for growing rice. Rice is a major export commodity, generating revenue for the country. Thailand has a total of 63.20 million rais of paddy and paddy fields in the whole country in 2015 with a yield of 27.42 million tons and an average yield of 456 kilograms per rai. Most of the rice growing area in the Northeast was 36.19 million rais, yield 12.23 million tons, but the average yield per rai was only 358 kilograms per rai (Office of Agricultural Economics, 2016). In addition, areas in the Northeast have problems with soil, weather and rainfall. It has been promoted as a cultivating area for aromatic rice, KDML 105 and RD 15. This is a species that adapt to climate is not suitable well, resistant to acid soil and saline soils, drought

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tolerant enough Bureau of Rice Research and Development, 2010). It is a good source of KDML 105 rice. It is the demand of the international rice market. According to the statistics of Thailand's rice exports, in 2015, exports of KDML 105 rice were 1,987 million kilograms, 5% rice were 3,002 million kilograms, 100% white rice were 555 million kilograms and of rice and Pathum Thani rice was124 million kilograms. Export value of KDML 105 rice is 52,830 million baht (Office of Agricultural Economics, 2015).

In 2015, Mahasarakam province had a total paddy area of 2,096,233 rai, accounting for 74.37% of the total agricultural land area (2,818,572 rai). Total rice yield was 716,286 ton, rice yield per rai was 365 kilogram per rai (Office of Agricultural Economics, 2016). Agriculturists were farmer amount 168,596 households Rice yields are adequate for people's consumption needs. And the output of paddy to sold 700,000 ton per year. It can make a provincial income of 8,400 million baht. The major production problems were the variability of rain, rain left, shortage of water source, low fertility of soil abundance, shortage of good quality rice seed, pest infestation, high cost for production. Including, the most of farmers lack knowledge and good practice for rice production technology. As a result, farmers are able to sell their rice yield at lower prices and higher production costs (Maha Sarakham Agriculture Office, 2014). It was consistent with Olan Pitak (2013), saying that the problems of the most farmers face nowadays were from the dimension of production: the productivity level is still low, dimension of management from high cost. As a result, the level of farmer income is relatively low. Therefore, it is impossible to seize rice cultivation as a stable source of income. Although household income net of farmers will increase from government assistance. But the price of inputs and the cost of living has been shifting. In addition, the price of rice product is also volatile. As a result, the debt of farmers is likely to increase. The main reason is that farmers do not have enough knowledge, lack of marketing insights for production planning, including knowledge in producing high quality agricultural products was safe to the consumer and environmentally friendly and lack of problem solving skills. If these problems can be eliminated from farming, sustainable farming will be strengthened.

As a result of the problem, the Mahasarakham Provincial Agricultural Extension Office has pushed for the establishment of the project to improve the quality and yield of KDML 105 rice in the province with the appropriate agricultural system (GAP) according to the provincial strategy. It is aimed at monitoring and certifying good agricultural systems and appropriate GAP systems. To obtain safe and standard agricultural products and support rice management project in Mahasarakham with GAP system (Mahasarakham Agriculture Offic, 2014). In line with the 11th National Economic and Social

Development Plan (2012-2016) and to develop and upgrade. Competition of major economic crops and supports linkage to the ASEAN Economic Community and increase the marketing channels of KDML 105 rice in the province in the country. For maximum benefit both to manufacturers and operators in both yield, quality and price.

Therefore, the researcher is interested to study the satisfaction of the farmers to gain knowledge and skills in quality KDML 105 rice production under management system of the good agricultural practice in Mahasarakham province. To be used as a guideline for promoting the production of quality and safe KDML 105 rice in the area for sustain the sustainability of farmers.

Materials and methods

Study area and sample size

The study was carried out during Fabuary to April 2016, and conducted in 12 Districts (excepted Chuen Chom District) of Mahasarakham Province, where GAP KDML 105 rice production is predominant, covering approximately 5,239 rai (Fig.1). Five hundred and twenty farmers of GAP KDML 105 rice production, who were listed in farmer registration database with Mahasarakham Agriculture Office in year 2014, were selected by purposive sampling method to provide the data. Researcher had specified it to be the sampling frame and then specified the size of the sample group by using Taro Yamane (1967)'s formula which had the sample size of 120 farmers of GAP KDML 105 rice production and used proportionate stratified sampling in order to select according to the district ratio and then sampling in each districts by using the simple random sampling in order to receive the proportionate amount in each district.

Data analysis

Data were analyzed using SPSS program. The statistics used in analysing the data were descriptive statistics which was used to find the basic static value including frequency, percentage, standard deviation and means of minimum value and maximum value. As for analysis of the satisfaction of farmers, it used weight mean scores by specifying the satisfaction as follows; 3.26 – 4.00 was the highly satisfaction, 2.51 – 3.25 was the moderately satisfaction, 1.76 – 2.50 was the less satisfaction and 1.00 – 1.75 was the non satisfaction.

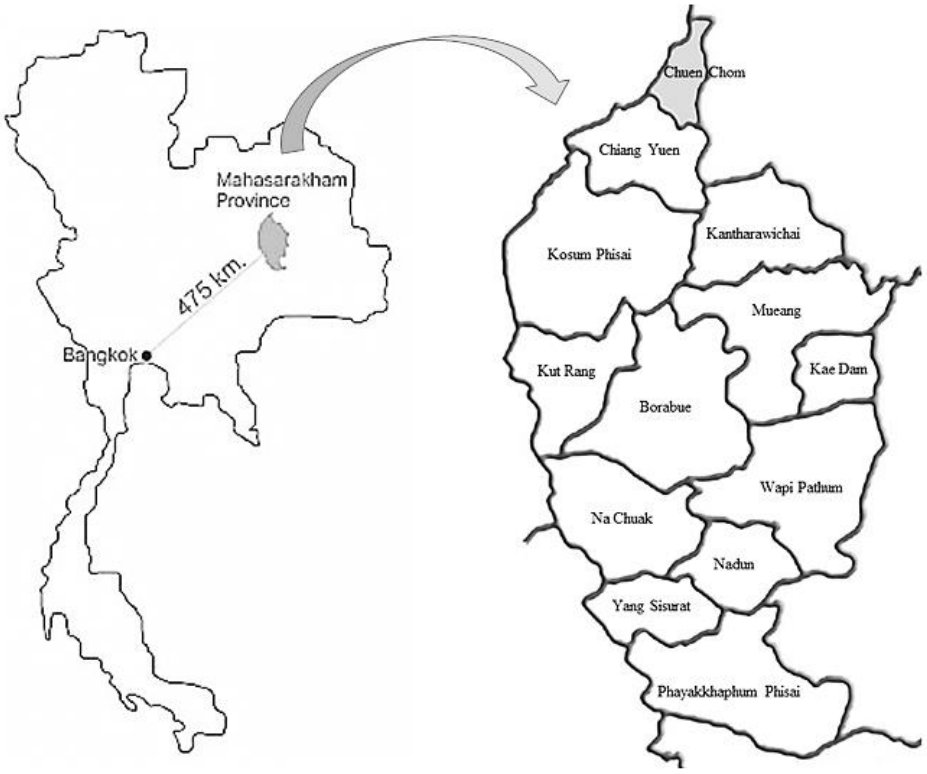

Figure 1. Map of 13 Districts repensentative of Mahasarakham Province comprehensive plan 2016

Source: http://www.inter.msu.ac.th/visit-all-visit-travel-maps.html and applied by the authors

Results

Characteristics of GAP KDML 105 rice farmer in the study area

Table 1 showed the characteristics of GAP KDML 105 rice farmer in the study area from the total of 120 respondents. The result showed that the most of GAP KDML 105 rice farmers were male (57.2%) with the ages between 51-60 years old (37.5%). The mean age of the respondents was 54 years old. In term of education level of the respondents (59.2%) graduated from primary school. The majority of the respondents (97.5%) were married. More than half of the respondents (54.2%) were community leadership. The result on the number of the respondents (55.0%) was the big household size between 4-5 persons, and the mean household size of the respondents was 4 persons.

Table 1. Characteristics of GAP KDML 105 rice farmer in the study area

Characteristics	Categories	Frequency (n=120)	Percentage
Gender	Male	69	57.5
	Female	51	42.5
Age of farmer	≤ 50 years	42	35.0
(Mean = 54 years old)	51-60 years	45	37.5
	> 60 years	33	27.5
Education level	Primary school	71	59.2
	Junior secondary school	15	12.5
	Senior secondary school	30	25.0
	Diploma degree	2	1.7
	Bachelor degree	2	1.7
Marital status	Single	2	1.7
	Married	117	97.5
	Widow	1	0.8
Community Leadership	Yes	65	54.2
Status	No	55	45.8
Number of household	≤ 3 persons	32	26.7
member	4-5 persons	53	44.2
(Mean = 4 persons)	> 5 persons	35	29.2
Number of household	≤ 3 persons	66	55.0
Labor	4-5 persons	44	36.7
(Mean = 3 persons)	> 5 persons	10	8.3
Land owner	Owner	109	90.8
	Owner and rent	10	8.3
	Rent	1	0.8
GAP KDML 105 rice	At least 1 year	91	75.8
experience	2-3 years	26	21.7
(Mean = 1.3 years)	> 3 years	3.0	2.5
GAP KDML 105 rice	≤ 5 rai	65	54.2
production area	6-10 rai	49	40.8
(Mean = 6.5 rai)	> 10 rai	6	5.0
Total yields of GAP	< 300 Kg./rai	51	43.6
KDML 105 rice (n=117)	300-500 Kg./rai	47	40.2
(Mean = 374.4 Kg./rai)	> 500 Kg./rai	19	16.2

Source: Computed by the authors from survey data
Note: 1 rai = 0.16 ha

Their household labors (55.0%) were less than 4 persons, and the mean household labor of the respondents was 3 persons. A greater percentage of the respondents (90.8%) were land owner for GAP KDML 105 rice production. The result also revealed that most of the GAP KDML 105 rice farmers (75.8%) had shorter growing GAP KDML 105 rice experience at least than 1 year and the mean experience of respondents was 1.3 years. The most of the respondents (54.2%) showed that their GAP KDML 105 rice production area was less than

6 rai or 0.96 hectares, and the mean area of respondents was 6.5 rai. The most of their total yields of GAP KDML 105 rice (43.6%) were less than 300 kilogram per rai, and the mean total yield of respondents was 374.4 kilogram per rai.

Satisfaction of farmers on GAP KDML 105 rice production technology

From the table 2, it was found that in the overall farmers have satisfactions in receiving knowledge and skills in KDML 105 rice production under GAP from Mahasarakham Agriculture Offic in high level. Farmers are highly satisfied with their promoting and supporting about water management for KDML 105 rice planting, quality management of pre- and post-harvest KDML 105 rice, pest management in KDML 105 rice fields, preparation area or soil for KDML 105 rice planting, basic knowledge on agricultural hazardous substances application in the KDML 105 rice production process, recording and storing data in the KDML 105 rice production process and soil improvement for KDML 105 rice planting, respectively.

Table 2. Satisfactions of farmers on GAP KDML 105 rice production technology

Satisfactions of GAP KDML 105 rice production	Average satisfaction score		Satisfaction level
	Mean	S.D.	
1. Water source management for rice planting	3.533	1.810	High
2. Preparation area / soil for rice planting	3.450	1.800	High
3. Soil improvement	3.292	1.457	High
4. Quality management of pre-harvest rice	3.508	1.838	High
5. Pest management in rice fields	3.467	1.851	High
6. Agricultural hazardous substances application	3.425	1.799	High
7. Quality management of post-harvest rice	3.533	1.819	High
8. Recording and storing data	3.367	1.909	High
9. Chemical fertilizer application	3.242	1.455	Moderate

Source: Computed by the authors from survey data

Water source management for KDML 105 rice plantint ($\bar{x}$ = 3.533), farmer had been got knowledge about the conservation of water resources and the environment surrounding the water resources that are not risk to contamination and suitable quality for farming in the KDML 105 rice production system.

Preparation area/soil for rice planting ($\bar{x}$ = 3.450), soil improvement ($\bar{x}$ = 3.292) and quality management of pre-harvest ($\bar{x}$ = 3.508) in KDML 105 rice production system, farmer had been got knowledge about seed source and

preparation of quality seed matched varieties. They should contain admixture of other rice variety shall not exceed 0.5%. The farmers participating in the KDML 105 rice production project under the GAP rice production system were able to obtain the seeds of quality that match the varieties certified by the Department of Rice by extension officer manage distribution. Knowledge about soil fertility increasing by using organic fertilizer at the rate of 500-2,000 kg./rai and did not burn stubble and rice straw in the field or promotion of legumes by sowing seeds, fresh manure, rate of 10 kg./rai and when the plants are fresh, the fertilizers were about 50 days old or flowering before planting for about 2 weeks. Knowledge about applications of organic fertilizer or organic chemistry fertilizer by farmers were encouraged and supported by organic chemistry fertilizer from government agencies. Knowledge about application of seed volume in rice seedlings, 5 to 7 kg./rai for transplanting and 10 to 20 kg./rai for dry seeded. Knowledge about soil preparation and planting method in seedbed, it should be prepared by the second plowing in crosswise should be done 7-10 days after and transplanting was made by using approximately 25 day-old seedlings. For dry seeded practice, planting field should be started from second plowing in crosswise should be done 15-30 days after with hand weeding at the same time by rice seeds should be sown or broadcasted uniformly on the plots at the rate of 10 to 20 kg./rai. Knowledge about elimination of off type rice plant during seed germination and plant development, inspect for admixture of off type rice plant at tillering, blooming, dough and maturing stages.

Pest management in rice fields ($\bar{x} = 3.467$) and Agricultural hazardous substances application ($\bar{x} = 3.425$) in KDML 105 rice production system, farmer had been got knowledge about control of pests and plant damage from pests. Farmers should learn to know about types, life cycles and controlling, as well as the environment and the ecosystem of the important rice pests, an appropriate controlling management must be applied according to the recommendation of the Rice Department.

Quality management of post-harvest rice ($\bar{x} = 3.533$), farmer had been got knowledge about management for good paddy quality. When the rice plants begin to bloom, the field should be inspected more frequently to notify flowering date which 80% of rice plants bloom. This date can be applied to estimate harvesting date. The optimum harvesting date is between 25 to 35 days after flowering date. Knowledge about harvesting and threshing by the thresher, it is necessary to know the variety of rice at previous harvest. If the machine has been harvested other varieties before, it requires cleaning up the system or do harvesting around the border area for 100 kg of paddy to purge any remaining. This portion of paddy should not be combined to the certified

commodity. Knowledge about drying practice, the following practice is to reduce moisture in paddy to 15% for trading, and 14% for storing. Drying paddy after was thresher was suggested dry paddy on a dry and clean supporting blanket to clean and prevent other varieties of rice contamination.

Recording and storing data ($\bar{x}$ = 3.533) in KDML 105 rice production system, farmer had been got knowledge about filing and/or documents should be arranged in groups in accordance with the cropping seasons for verification convenience and implementation. Data records and significant documents related to the practices should be well kept for at least three consecutive years of production or in accordance with the requirement of the administrator or trade partner for verification.

Only one issue, farmers have the moderate satisfaction level as chemical fertilizer application. Farmers used chemical fertilizers ($\bar{x}$ = 3.242) in KDML 105 rice production system. The condition of the area in the KDML 105 rice production process was mostly sandy loam. Good and appropriate management for chemical fertilizers was recommended to twice apply fertilizers. First time, the recommended basal application was 20-25 kg./rai of either of the following compound fertilizers, 16-20-0. Second time, Top dressing application was 5-10 kg./rai of urea 46-0-0.

Satisfaction of farmers on GAP KDML 105 rice production technology by different education level

From the table 3, it was found that satisfaction toward the KDML 105 rice production according to the GAP standard of farmers with different of gender, age, education level, experience of GAP rice cultivation and yield of GAP KDML 105 rice yield. It was found that the education level of farmers was different. There was different satisfaction on knowledges for GAP KDML 105 rice produciton at 0.05 levles in 1 of content as soil improvement for GAP KDML 105 rice planting. Farmers was secondary level of education level ($\bar{x}$ = 3.778) had a higher mean satisfaction than those with the elementary level of education level (x = 3.042). However, the two groups of farmers had no statistically significant difference in satisfaction compared to those of the higher secondary level. It was less satisfaction ($\bar{x}$ = 2.250) .

It also found that the education level of farmers was different. There was different satisfaction on knowledges for GAP KDML 105 rice produciton at 0.01 levles in 1 of content as chemical fertilizer application for GAP KDML 105 rice production. Farmers was secondary level of education level ($\bar{x}$ = 3.711) had a higher mean satisfaction than those with the elementary level of education level (x = 2.986). However, the two groups of farmers had no

statistically significant difference in satisfaction compared to those of the higher secondary level. It was less satisfaction ($\bar{x}$ = 2.500).

Table 3. Satisfactions of farmers on GAP KDML 105 rice production as categorized by different education level

Satisfactions of GAP KDML 105 rice production	Elementary school		Secondary school		> Secondary school		F-values
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
1. Water source management	3.437	1.918	3.756	1.667	1.258	2.750	0.813
2. Preparation area / soil for rice planting	3.310	1.872	3.778	1.677	2.250	1.258	1.877
3. Soil improvement for rice planting	3.042[b]	1.346	3.778[a]	1.521	2.250[abc]	1.258	4.860**
4. Quality management of pre-harvest rice	3.408	1.939	3.778	1.677	2.250	1.258	1.540
5. Pest management in rice fields	3.380	1.945	3.711	1.714	2.250	1.258	1.341
6. Agricultural hazardous substances application	3.282	1.876	3.756	1.667	2.250	1.258	1.864
7. Quality management of post-harvest rice	3.423	1.940	3.778	1.650	2.750	1.258	0.907
8. Recording and storing data	3.239	2.018	3.667	1.745	2.250	1.258	1.407
9. Chemical fertilizer application	2.986[b]	1.347	3.711[a]	1.532	2.500[abc]	1.291	4.168*

* Significantly different at P < 0.05 ** Significantly different at P < 0.01

Means within the same row followed by the same letter are no significantly different (Scheffe's test: P > 0.05).

Source: Computed by the authors from survey data

Discussion

The majority characteristic of GAP KDML 105 rice farmers in Mahasarakham were male, aged between 51 – 60 years old. This is consistent with the general characteristics of Thai farmers: male and old aged. The documentary by FAO (2000) stated that only the old generation is staying with the rice farming. It was noticed that the farmers in the study area had an average age higher than the average age of those in Thailand (54 years old) (Kumpa, 2015). The result is also consistent with research in socio-economic of GAP KDML 105 rice farmer which most of the farmer were male (Ayoola *et al*, 2011; Kennvidy, 2011; Fakkhong and Suwanmaneepong, 2015).

It can be seen that the overall of the farmers had highly satisfaction levels on KDML 105 rice production according to GAP, although there was an issue with moderate satisfaction level. This is consistent with Hassim *et al*. (2013). All rice growers can understand the principles of good agricultural systems that were more than 50%. Farmers had a good attitude towards good agricultural systems for KDML 105 rice production. Because farmers' satisfaction will come when they get what they want. The nine knowledge contents are knowledge about KDML 105 rice production to GAP standards, which is what farmers need.

According to studies, it has been found that darmers still need to promote and support the knowledge and skills related to the production of GAP KDML 105 rice. Although agricultural promoters were transferring knowledge and skills to farmers but sometimes these things can not reach the farmer. It may be due to educational constraints and older farmers. Exposure to technology and technology is far from over. It was consistent with opinion of Thongdeelerd (2004), who said that in fact, farmers in Thailand are still relatively limited in education. If lack of literacy skills, it is a major obstacle to agricultural promotion. Because of the content of GAP KDML 105 rice has issues that need to be recorded in the production process at almost every step. This requires basic literacy to fully comply with the GAP guidelines. In this case, it was a public sector burden, whether it was to provide direct knowledge and skills to farmers or assistance with a helper or central to facilitate the area. They can help farmers to access and follow the instructions on how to produce GAP. Although the farmers were satisfied with the knowledge and skills but farmers can not do it, it would be useless and wasted. It also creates boredom, confusion, and may turn out to be anti-GAP system. Lack of trust in modern agricultural extension methods follows. Therefore, the promotion of knowledge and skills for the production of GAP KDML 105 rice must continuity and follow-up assessment of knowledge and skills are required practical using in improving and improving the production of GAP KDML 105 rice. It will meet the needs and solve problems for farmers. It makes farmers satisfied and to get the knowledge and skills of agriculture.

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