
Farmer satisfaction with coconut cultivation: A case study in the upper southern region of Thailand

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Sivakorn, P., Raumjit, N. and Sumonrat, J. (2023). Farmers' satisfaction for coconut cultivated: A case study in in the upper southern region of Thailand. *International Journal of Agricultural Technology* 19(3):1327-1336.

Abstract The satisfaction survey of coconut farmers and coconut marketing in the area were investigated in Prachuap Khiri Khan, Chumphon, and Surat Thani provinces of 577 cases. Result found that farmers were satisfied with their careers in coconut plantations, and the price of the coconut market including the overall satisfaction of the promotion of coconut planting from government agencies. The average score was ranged between 3.6-4.6 points, which was the most satisfactory level. In Ranong Province was also found the satisfaction score of working in a coconut plantation. The price of the coconut market including the overall satisfaction of coconut plantation were encountered by promotion from government agencies at 2.7 points, which was a moderate level of satisfaction.

Keywords: Farmer satisfaction, Coconut

Introduction

Coconut (*Cocos nucifera* L.) is an agricultural commodity that plays a vital role in the agricultural sector of Thailand (Jeenkerdsup, 2019). In 2020, Thailand had a total coconut plantation area of 137,510.24 ha, of which the largest part was in the central region with 70,048.32 ha, followed by the southern region at 58,712.32 ha. In the southern region, Prachuap Khiri Khan, Chumphon, and Surat Thani were the provinces with the largest areas of coconut plantations (Office of Agricultural Economics, 2021). Farmers prefer to grow native Thai coconut varieties, which can be harvested throughout the year (Tunjaroen *et al.*, 2019). Coconut is commonly used in savory and sweet dishes that Thais consume in their daily lives. It can also be used as a raw material for coconut milk, desiccated coconut, coconut oil, and shredded coconut, and it is also utilized in the broader food and cosmetics industries

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(Junmee *et al.*, 2021). In recent years, the production of coconuts has tended to decrease, Thailand has not been producing enough fruit to meet domestic demand, and this shortfall has become especially troublesome for the industries that process coconut into a variety of products, and has also had a negative impact on those who export to trade partner countries (Tunjaroen *et al.*, 2019). The decrease in supply can be attributed to the fluctuating coconut price in the country and the diminishing motivation of farmers to keep on growing coconuts as opposed to other crops such as fruit, rubber, and oil palm. As a result, coconut production cannot meet the industrial sector demand, a situation that has led to the country importing coconuts from foreign countries (Junmee *et al.*, 2021). Still, farmers in the southern region continue to cultivate coconuts. However, if the currently available farmers stop growing coconuts, the overall economy of Thailand will be adversely affected. Hence, the level of satisfaction among coconut farmers was investigated in order to provide helpful information and to promote the stability and sustainability of the Thai coconut agri-business, particularly in the upper southern region of Thailand.

Nowadays, the demand for coconut is increasing. In particular, the finished coconut milk industry is exported worldwide since 2012, exporting 110,000 tons per year, increasing to 180,000 tons, worth 1,500 million baht, while the domestic market has also increased demand for the number of tourists who visit Thailand, there is an increasing demand for Thai food consumption. and prefer to buy products made from coconuts such as coconut oil Which is valuable in terms of food and medicine (Thai Rath, 2017) Coconut cultivation has a relatively low cost of production. less labor and has a harvesting period of more than 50 years with a yield rate per require high compared to the coconut production rate of the Philippines and Indonesia (Nonghanpitak *et al.*, 2011). The objective was to study the satisfaction of coconut farmers and coconut marketing in the upper southern region of Thailand in 4 provinces, namely Prachuap Khiri Khan, Chumphon, and Surat Thani. and Ranong provinces.

Materials and methods

Sample

Random sampling was used to select coconut farmers to include in the survey. A total of 584 farmers were drawn from the four provinces in Prachuap Khiri Khan (n = 221), Chumphon (274), Surat Thani 82, and Ranong (n = 7).

Table 1. Survey sites and sample sizes

Survey province	Survey district	Sample Size
Prachuap Khiri Khan	King Amphoe Sam Roi Yot	20
	Kui Buri	27
	Hua Hin	3
	Bang Saphan	33
	Bang Saphan Noi	33
	Mueang Prachuap Khiri Khan	50
	Pran Buri	7
	Thap Sakae	48
Chumphon	Mueang Chumphon	49
	Tha Sae	13
	Pathio	31
	Sawi	52
	Thung Tako	46
	Lang Suan	49
	Phato	20
	Lamae	14
Surat Thani	Phunphin	25
	Ko Pha-ngan	46
	Kanchanadit	6
	Don Sak	5
Ranong	Mueang Ranong	7

Research tools

Questionnaires were created by the research team. The questions were used the satisfaction of coconut farmers with 5 aspects of their business: the varieties planted, the yield per ha, the selling method (price per fruit), the selling price, and the promotional activities of government agencies. The research instrument had a 5-level rating scale according to the Likert Scales method, and the scoring criteria was as follows: 5 points indicated the highest level of satisfaction, 4 points indicated high satisfaction, 3 points indicated moderate satisfaction, 2 points indicated low satisfaction, and 1 point indicated the lowest level of satisfaction.

Collection and analysis data

Data were collected from the sample group via questionnaire. The data were analyzed using descriptive statistics and presented in the tables. The statistics were mean and standard deviation. The interpretation of the mean was done according to Boonchom Srisaat (2002) as 4.51-5.00 represented satisfaction of the highest level, 3.51-4.50 represented satisfaction at a high level, 2.51-3.50 represented satisfaction at a moderate level, 1.51-2.50

represented satisfaction at a low level, and 1.00-1.50 indicated satisfaction at the lowest level.

Results

The results of the satisfaction analysis of farmers in Prachuap Khiri Khan Province is shown in Table 2. The sample set was 221 coconut farmers. The overall level of satisfaction of the farmers with their business came in at a high one, with an average score of 4.2. The Prachuap Khiri Khan farmer showed highest level of satisfaction with the varieties of Thai cultivated coconut which had a mean score of 4.6 points. The yield per hectare showed a high level of satisfaction, scoring an average of 4.1 points. Farmers were satisfied at a high level with the method of selling coconuts (price per fruit), which scored at an average of 4.1 points. Farmers were also satisfied at a high level with the current coconut price, and scored was 4.2 points. Finally, farmer level of satisfaction with the promotional activities of government agencies was scored at 3.8 points, indicating that the respondents were satisfied with the promotional activities at a high level.

Table 2. Evaluation Score, mean and standard deviation of farmer satisfaction with aspects of coconut agri-business in Prachuap Khiri Khan province (n = 221)

Satisfaction of farmer	Evaluation Score					n	Mean	S.D.	Level of satisfaction ¹
	5	4	3	2	1				
1. coconut varieties	133	78	10	0	0	221	4.6	0	Highest
2. yield per ha	52	134	31	4	0	221	4.1	0.7	High
3. Distribution method	66	123	31	1	0	221	4.1	0.7	High
4. Selling price	89	99	32	1	0	221	4.2	0.7	High
5. Promotion of coconut planting from government agencies	35	123	52	8	3	221	3.8	0.8	High
Overall rating							4.2	0.1	High

¹/ Refer to highest = 4.51-5.00, High = 3.51-4.50

It is dealt with the situation in Chumphon province. The sample set consisted in 274 coconut farmers, who indicated that they were satisfied with their careers in coconut planting, at a high level, and gave that aspect an average score of 3.6. The Chumphon farmers were satisfied at a high level with the Thai coconuts they cultivated, ranking them at an average of 3.8 points. The yield per hectare received a medium level of satisfaction, and it averaged 3.6 points. Farmers were satisfied at a medium level with the method of selling coconuts which averaged of 3.5 points. Farmers were satisfied at a high level with the current coconut price and averaged score of 3.8 points. Finally, their satisfaction with the coconut industry promotions done by government agencies was averaged score of 3.3 points, indicating that the respondents were satisfied with the promotional activities at a medium level (Table 3).

Table 3. Evaluation score, mean and standard deviation of farmer satisfaction with aspects of coconut agri-business in Chumphon province (n = 274)

Satisfaction of farmer	Evaluation Score					n	Mean	S.D.	Level of satisfaction ¹
	5	4	3	2	1				
1. coconut varieties	29	170	66	9	0	274	3.8	0.7	High
2. yield per ha	17	146	100	10	1	274	3.6	0.7	High
3. Distribution method	20	110	136	7	1	274	3.5	0.7	Medium
4. Selling price	42	147	70	14	1	274	3.8	0.8	High
5. Promotion of coconut planting from government agencies	20	115	94	27	18	274	3.3	1.0	Medium
Total							3.6	0.1	High

¹/ Refer to High = 3.51-4.50, Medium =2.51-3.50

The data for the satisfaction of coconut farmers in Surat Thani is shown in Table 4. The sample set consisted in 82 farmers. The Surat Thani farmers survey indicated the highest level of satisfaction with their careers in the coconut agri-business, and their overall score was 4.6. The farmers were satisfied at the highest level with the Thai coconut varieties and gave the aspect with an average score of 5.0 points. The yield of coconut per ha was ranked at the high level which averaged score was 4.4 points. Farmers were satisfied at a high level with the method of selling coconuts at a price per fruit which

averaged of 4.5 points. The current selling price received the highest level of satisfaction with an average score of 4.6 points. Finally, satisfaction with government agency promotions got an average of 4.5 points, indicating that the respondents were satisfied with the government agency promotional activities at a high level.

Table 4. Evaluation score, mean and standard deviation of farmer satisfaction with the coconut agri-business in Surat Thani province (n = 82)

Satisfaction of farmer	Evaluation Score					n	Mean	S.D.	Level of satisfaction ¹
	5	4	3	2	1				
1. coconut varieties	79	3	0	0	0	82	5.0	0.2	Highest
2. yield per ha	36	46	0	0	0	82	4.4	0.5	High
3. Distribution method	42	40	0	0	0	82	4.5	0.5	High
4. Selling price	46	36	0	0	0	82	4.6	0.5	Highest
5. Promotion of coconut planting from government agencies	45	37	0	0	0	82	4.5	0.5	High
Total							4.6	0.1	Highest

¹/ Refer to highest = 4.51-5.00, High = 3.51-4.50

The level of satisfaction of selected coconut farmers in Ranong is shown in Table 5. The sample set was 7 farmers. Their overall satisfaction with the business was found to be medium level, averaged score of 2.7. The farmers were satisfied at the medium level with the Thai varieties of coconuts which averaged score of 3.0 points. The yield per ha received satisfaction level of medium which averaged score of 2.9 points. The Ranong farmers were satisfied at the medium level with the method of selling coconuts at a price per fruit which averaged score of 2.9 points. Satisfaction with the current coconut price was found to be the medium level which averaged score of 2.6 points. Last, the satisfaction with promotion by government agencies gained an average score of 2.3 points, indicating that the respondents were satisfied at a low level with the promotion of coconut planting by government agencies.

Table 5. Evaluation Score, mean and standard deviation of farmer satisfaction with various aspects of the coconut cultivation agri-business in Ranong province (n = 7)

Satisfaction of farmer	Evaluation Score					n	Mean	S.D.	Level of satisfaction ¹
	5	4	3	2	1				
1. coconut varieties	0	1	5	1	0	7	3.0	0.6	Medium
2. number of yields per ha	0	0	6	1	0	7	2.9	0.4	Medium
3. Distribution method	0	0	6	1	0	7	2.9	0.4	Medium
4. Selling price	0	0	4	3	0	7	2.6	0.5	Medium
5. Promotion of coconut planting from government agencies	0	0	2	5	0	7	2.3	0.5	Low
Total							2.7	0.1	Medium

^{1/} Refer to Medium = 2.51-3.50, Low = 1.51-2.50

Discussion

The survey data showed that farmers in Surat Thani province had the highest level of satisfaction with coconut planting. This was followed by the Prachuap Khiri Khan Province and Chumphon, who had a high level of satisfaction. This result may be due to the farms in three provinces had high coconut yields per rai in the range of 673 - 1,012 fruits/rai/year (Office of Agricultural Economics, 2017), and the average price of coconuts throughout the year was 17.0 baht/fruit (Theppadungporn and Thitilaks, 2021). However, in Ranong Province, farmer satisfaction was found at a moderate level. This may be due to the low yield of coconuts per rai, averaging 648 fruits/rai/year (Office of Agricultural Economics, 2017). Nevertheless, the farmers had high incomes from selling coconuts. As a result, they were satisfied with the coconut planting career.

The results showed that the 584 coconut farmers in the 4 provinces: Prachuap Khiri Khan, Chumphon, Surat Thani and Ranong, were satisfied with the coconut varieties they planted, yield per rai, distribution method, selling price, and governmental promotions (Figure 1). One difference was the farmers in Prachuap Khiri Khan and Surat Thani province had the highest level of satisfaction with the Thai varieties of coconut grown, and they were followed by farmers in Chumphon Province, who had a high level of satisfaction. However, in Ranong Province, farmer satisfaction with coconut varieties used was at the middle level. In any case, farmers in all four provinces were still more satisfied with the Thai coconut varieties than with hybrids. This may be

to the farmers did not have information about hybrid coconuts and they were not available. Other researchers noted that farmers selected good varieties to grow to reduce cost. Thai coconuts had a large fruit which genetically diverse and provided consistent yields throughout the year. Furthermore, the Thai varieties have faced disease and insect resistant to agrochemicals and drought tolerant (Junmee *et al.*, 2021).

Farmer satisfaction with yield per rai in Prachuap Khiri Khan, Chumphon and Surat Thani provinces was at the high level. Ranong Province revealed to be moderate level. The amount of yield per rai depends on environmental factors, management of coconut plantations, diseases, and insects. According to Junmee *et al.* (2021) in Prachuap Khiri Khan province, the yield of coconuts was less than 1,000 fruits/rai/year due to the average rainfall of 1,362 millimeters per year. While in Chumphon and Surat Thani provinces, the average rainfall was 2,125 and 1,630 mm per year respectively, (Meteorological Department, 2020). They get the yields more than 1,000 coconuts / rai / year. A comparison of coconut yields from the Office of Agricultural Economics (2021) reported that an average yield was between 900 - 1,000 fruits / rai / year. However, if farmers performed good coconut plantation management, yields of 1,100–1,500 fruits/rai/year would be possible reached the target (Junmee *et al.*, 2021).

The method of distributing the coconut attracted a high level of satisfaction from the farmers in Prachuap Khiri Khan and Surat Thani provinces. The Chumphon and Ranong provinces indicated a moderate level of satisfaction. The selling method of farmers in all 4 provinces was to sell the coconut fruit to merchants in the area. The purchasers harvested and graded fruits into large, medium and small-sized fruits. Two small-sized fruits were combined to equal one large fruit (Junmee *et al.*, 2021).

Farmer satisfaction with the selling price of coconuts in Surat Thani province was at the highest level. The farmers in Prachuap Khiri Khan and Chumphon province had a high level of satisfaction. In Ranong province, farmer satisfaction was a moderate level. In all 4 provinces, the farmers were satisfied with the price of coconut at a moderate to very high level. This was probably because in the year of the survey (2017), the average yearly price of large sized coconuts was 17.0 baht/fruit (Theppadungporn and Thitilaks, 2021). Promotion of coconut planting by government agencies in Prachuap Khiri Khan and Surat Thani province received a high level of satisfaction from farmers. Farmers in Chumphon province indicated a moderate level of satisfaction. However, farmers in Ranong Province ranked government promotional efforts at a low level.

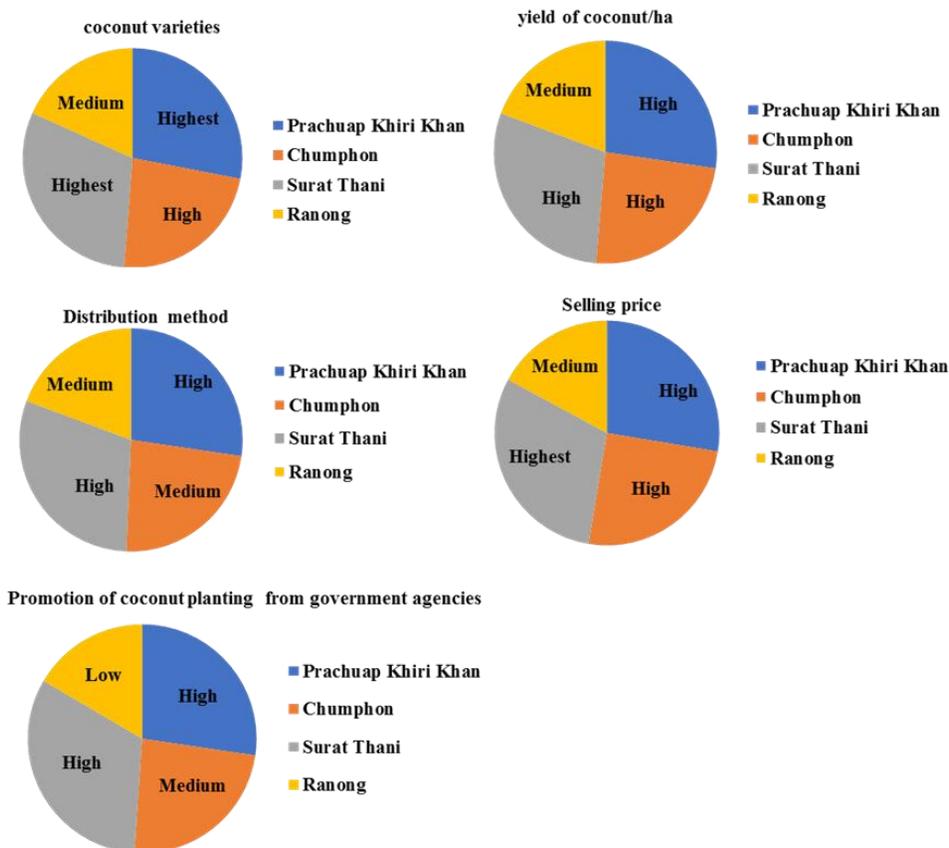


Figure 1. The satisfaction levels of farmers with various aspects of the coconut agribusiness in Prachuap Khiri Khan, Chumphon, Surat Thani and Ranong provinces

The survey of the satisfaction of 578 coconut farmers in the area of Prachuap Khiri Khan, Chumphon, and Surat Thani provinces revealed that farmers had a high level of satisfaction with the coconut plantation occupation. This was probably because over the survey period in 2017-2018, coconut attracted a good selling price in the range of 10-20 baht. The price is an incentive that makes coconut farmers satisfied. However, the price of coconut has been quite volatile while the demand for the product has been high. Therefore, to achieve sustainability for the farmers and the agri-business, the government should promote farmer knowledge and skills to increase productivity, reduce price risk, and encourage more coconut intercropping. At the same time, the coconut price should be guaranteed. This should help to reduce the import of coconuts from abroad. They should also further support coconut processing in industrial systems to incentivize farmers to grow

coconuts sustainably. Department of Agricultural Extension (2014) added that the Tall stem of Thai coconut plants (large coconuts) begins to emerge at the age of 5 years and harvest at the age of 6 years and continues to increase until the age of 12 years and keeping the yield constant until the age of 60 years, after which the yield begins to decrease, it is not economically worthwhile which continue to maintain. It should be replanted again in the middle between the trees or between the rows.

Acknowledgements

This study was funded by a grant from the National Research Council of Thailand (NRCT). The authors would like to thank the farmers for granting us interviews, and the authors of the references cited in this article.

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(Received: 20 October 2022, accepted: 10 April 2023)