

Factors Affecting Revenue of Pineapple Farmers: An Empirical Study in Prachuap Khiri Khan Province

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Abstract

The purpose of this study was to study the relationship between individual fundamental factors of farmers namely; Cost, Liabilities, Sources of funds, income of pineapple farmers related to the nature of land ownership utilization, Distribution channels of pineapple products and external environmental factors, and income of pineapple farmers. The sample was 395 farmers. The research instruments were questionnaires. The statistics used in the research were percentage and multiple regression analysis. The results showed that the majority of farmers with 1–3 household members had experiences in planting pineapples for 1–20 years and gaining knowledge on how to grow pineapples from their parents and relatives. In addition, farmers had a monthly cost of cultivation in excess of 30,000 baht from personal investment. For the creation of liabilities, most of the respondents were related to agriculture, and had their own land with an area of less than 30 acers. Farmers sell their products to industrial plants through middlemen. and opinions that the measures to promote the consumption of fresh pineapple were the most beneficial. The income of most pineapple farmers earned more than 30,000 baht. They also faced problems with wilt and suffer from drought the most. In addition, it was found that the factors influencing

farmers' incomes were in a positive direction. The significance level of 0.05 was the individual basic factors of the farmers. In addition, negative factors influencing farmers' income were also found at the level of significance of 0.05. Moreover, farmers also encountered the problem of expensive chemical fertilizers, unstable production prices, lack of knowledge about the prevention and elimination of fungal diseases as well as lack of knowledge about the production system and the proper use of production technology for pineapple planting.

Keywords; Pineapple Farming Factors, Factor Analyzing, Revenue of Pineapple Farmers

Introduction

Pineapple is an important economic crop of Thailand that generates approximately 23,000 – 25,000 million baht as country income per year. Consumption of Batavia pineapple cultivars, approximately 20% of the total production is for domestic consumption. Approximately 80 percent of the total output will go to processing plants for processing into various products for export. In 2020, Thailand is the world's 4th largest exporter of canned pineapple products, with an export value reaching 10,032,740,229 baht. The main export markets for canned pineapples are the United States, Germany, Russia, Poland and Japan. Thailand pineapple juice is the world's second largest exporter. The main export markets are the Netherlands, South Korea, China, Australia and Vietnam (Agriculture and Cooperatives Office, 2020). Although pineapples are an important economic crop, during 2019-2020 the total yield of Batavia pineapple varieties in Thailand is likely to decline from 2.01 million tons in 2016, with a decrease in 2020 to 1.39 million tons, mainly due to the increase in pineapple harvesting capacity during 2017 – 2018 and the production exceeding market demand. As a result, during 2019-2020, farmers reduce their pineapple planting areas and switch to other crops. Lacking funds for maintenance and a shortage of post-harvest technology to extend the shelf life of fresh pineapples for a long enough time and quality are also essential impediment. There is also a problem with contamination and various insect diseases, which are the main obstacles in bringing fresh pineapples to be exported to foreign countries resulting in loss of income opportunities for farmers who grow fresh pineapple. There are also some overwhelming canned pineapple exporting to some countries, such as Costa Rica, the Philippines, Brazil and China, which are among the top five in the world. Prachuap Khiri Khan Province is the country's largest producer of Batavia pineapples. In 2020, pineapple is the third most important economic crop in Prachuap province. There is planting area of 242,057 acers, followed by coconut and para rubber, with planting area 409,940 acers and 257,715 acers, respectively. As mentioned above, the importance of pineapple is recognized as one of the country's economic crops and of Prachuap Khiri Khan province to increase competitiveness and drive the Thai pineapple industry to be sustainable as well as maintain a proportion of exports to bring income into the country and to solve the problem of declining pineapple planting rate. Therefore, it is necessary to study the factors influencing the income of pineapple farmers in order to make farmers immune to changes under globalization and various changing situations (Wongchaum, 2011).

Consequently, it is significant to investigate the factors influencing of pineapple revenue in Prachuap Khiri Khan province to study the characteristics of variables influencing income of pineapple farmers in Prachuap Khiri Khan province as well as various problems. The knowledge gained from this research will be a guideline to develop the potential for generating income of pineapple farmers. and increase competitiveness as well as result in farmers being immune self-reliance and have a good quality of life.

Research objectives

This study was to study the relationship between individual fundamental factors of farmers: Cost; Liabilities; Sources of Funds; Income of Pineapple Farmers related to the nature of land ownership utilization; Distribution channels of pineapple products; External environmental factors; and Income of pineapple farmers.

Research Methodology

The population used in this research was 12,470 pineapple farmers in Prachuap Khiri Khan province according to the registration of the Prachuap Khiri Khan Provincial Agriculture Office in December 2020. The study samplings were 395 pineapple farmers derived through random sampling using Taro Yamane's formula (Yamane, 1970). A 95% confidence interval was obtained from a sample of 376, which was considered the minimum acceptable threshold. Therefore, the sample size in each district was calculated by comparing the proportion of the population in each district as follows: 8 pineapple farmers from Bang Saphan Noi District, 86 pineapple farmers from Hua Hin District, 67 pineapple farmers from Mueang Prachuap Khiri Khan District, 57 pineapple farmers from Kui Buri District, 55 pineapple farmers from Sam Roi Yot District, 53 pineapple farmers from Bang Saphan District, 49 pineapple farmers from Pramburi District, and 20 pineapple farmers from Thap Sakae District.

Data was collected from 2 sources as 1) information obtained from studying and researching documents, textbooks, articles on theories, concepts and related research results, and 2) information obtained from the questionnaire.

The model used in the study

1. A study of the relationship between individual basic factors of farmers and income of pineapple farmers.

$$REV = \beta_0 + \beta_1 \text{ Family} + \beta_2 \text{ Experience} + \beta_3 \text{ Knowledge} + \varepsilon_i \quad (1)$$

2. A study on the relationship between cost, liabilities, and sources of funding and income of pineapple farmers.

$$REV = \beta_0 + \beta_1 \text{ Cost} + \beta_2 \text{ Capital} + \beta_3 \text{ Loan} + \varepsilon_i \quad (2)$$

3. The study of the relationship between factors of land ownership characteristics utilization and distribution channels of pineapple products and the income of pineapple farmers

$$REV = \beta_0 + \beta_1 \text{ Land} + \beta_2 \text{ Owner} + \beta_3 \text{ Distribution} + \varepsilon_i \quad (3)$$

4. A study of the relationship between external environmental factors such as government assistance measures. Problems with epidemics and natural disasters on the income of pineapple farmers

$$REV = \beta_0 + \beta_1 \text{ Policy} + \beta_2 \text{ Disease} + \beta_3 \text{ Disaster} + \varepsilon_i \tag{4}$$

Table 1 Defining the independent variables and symbols

Variables	Symbols
Dependent variables	
Pineapple farmer revenue	REV
Independent variables	
(1) Individual basic factors of farmers	
1. Number of household members	Family
2. Number of years of experience in pineapple cultivation of the head of the family	Experience
3. Source of knowledge in pineapple cultivation	Knowledge
(2) Cost factors, liabilities and sources of funds	
1. Liabilities that are used to pay in various fields	Loan
2. Cost of pineapple cultivation	Capital
3. Investment money	Cost
(3) Factors related to the nature of land ownership Uses and distribution channels of pineapple products	
1. Area used in agriculture	Land
2. Characteristics of land ownership	Owner
3. Distribution channels of pineapple products	Distribution
(4) external environmental factors	
1. Government assistance measures	Policy
2. Problems with natural disasters	Disaster
3. Problems with the epidemic	Disease

Research Instrument

Data collection instrument of this study was a questionnaire to study the characteristics of variables influencing income of pineapple farmers in Prachuap Khiri Khan province. The questionnaire was divided into 4 parts:

Part 1 was closed-ended questions about the individual basic factors of farmers.

Part 2 was closed-ended questions about cost factors, liabilities and funding sources.

Part 3 was closed-ended questions about the nature of land ownership factors, utilization and distribution channels of pineapple products.

Part 4 was closed-ended questions about external environmental factors such as government assistance measures, problems with epidemics and natural disasters.

Part 5 was closed-ended questions about the income of pineapple farmers.

Data collection

This study was to study factors influencing income of pineapple farmers. The researcher had a meeting to clarify and understand the data collection process with research assistants. The survey was conducted using a closed-ended questionnaire to identify factors influencing income of pineapple farmers.

Data analysis

Data analysis was divided into 2 types: The first one was descriptive data analysis by using statistics, i.e. frequency, percentage, mean and standard deviation, and inferential analysis of the data to find the relationship of the variables. The second one was multiple regression analysis used to test the influence of various factors on the income of pineapple farmers. The level of statistical significance was set at 0.05.

Results

1. Descriptive data analysis The results of the analysis are as follows.

1.1 An analysis of the individual basic factors of farmers was found that most of the respondents were in Hua Hin District, with 1-3 household members having 21-40 years of experience in pineapple planting. Most of the pineapples farmers(29.9%) were educated from their parents and relatives.

1.2 An analysis of cost, liabilities and sources of funding was found that most of the respondents had an average monthly cost of cultivation higher than 30,000 baht for 71.1%. Farming came from private finance for 54.7%, and debt burden from agricultural use for 52.9%.

1.3 An Analysis of utilization factors of land ownership was found that the majority of respondents, had pineapple planting areas less than 30 acers, and 54.4%, 49.1% had their own land. Distributed by means of sending industrial factories to be processed through middlemen represented 55.2%.

1.4 An Analysis of external environmental factors such as government assistance measures, and problems with epidemics and natural disasters was found that most of the respondents, thought that the measure to promote the consumption of fresh pineapple was the most useful (38.5%). Problems with the outbreak of wilt were the most common accounted for 34.9%. Most of the respondents encountered the drought problem, representing 63.3%..

1.5 An analysis of income was found that most of the respondents had an average monthly income of 30,000 baht or more, or accounted for 71.6%.

2. Inferential Data Analysis. The analysis of factors affecting income of pineapple farmers using Pearson's correlation statistic (Person Product Moment Correlation Coefficient; r), the level of significance was set at 0.05 with the following details:

Table 2 Analysis results of Multiple Linear Regression

Model	Standardize	<i>t</i>	<i>p</i>
	Coefficients		
	Beta		
Family_1	.135	3.996	.000*
Family_2	.219	6.289	.000*
Experience_1	.173	3.709	.000*
Experience_2	.228	5.442	.000*
Knowledge_1	.770	17.518	.000*
Knowledge_2	.304	12.489	.000*
Knowledge_3	.268	6.208	.000*
Knowledge_4	.434	11.010	.000*

Note: * $p < .05$.

Table 3 Analysis results of Multiple Linear Regression

Model	Standardize	<i>t</i>	<i>p</i>
	Coefficients		
	Beta		
Loan_1	-.891	-7.627	.000*
Loan_2	-.705	-6.909	.000*
Capital	-.332	-6.588	.000*
Cost	-.352	-8.796	.000*

Note: * $p < .05$.

Table 4 Analysis results of Multiple Linear Regression

Model	Standardize	<i>t</i>	<i>p</i>
	Coefficients		
	Beta		
Land	-.243	-4.659	.000*
Owner_1	-.796	-9.135	.000*
Owner_2	-.790	-16.949	.000*
Distribution_1	.296	11.612	.000*
Distribution_2	.575	9.904	.000*

Note: * $p < .05$.

Table 5 Analysis results of Multiple Linear Regression

Model	Standardize	<i>t</i>	<i>p</i>
	Coefficients		
	Beta		

Policy_1	.186	7.447	.000*
Policy_2	.127	3.494	.001*
Disaster_1	-.195	-1.895	.059
Disaster_2	-.128	-3.441	.001*
Disease_1	-.876	-8.770	.000*
Disease_2	-.508	-4.862	.000*
Disease_3	-.400	-12.197	.000*

Note: * $p < .05$.

Conclusion and Discussion

1. From the study of demographic factors, it was found that most of the farmers had 1-3 members in the household who had 1 to 20 years of experience in pineapple planting and gained knowledge in pineapple cultivation from their parents and close relatives. For cost factors, liabilities and sources of funding, it was found that most farmers had a monthly crop cost of more than 30,000 baht. Most of their investments were private funds, and the burden of debt that was used to spend on agriculture. For land ownership utilization, it was found that most of the farmers had less than 30 acers of pineapple planting area and had their own land. In addition, most farmers brought their produce to industrial factories for processing through middlemen. For external environmental factors, it was found that to promote the consumption of fresh pineapples were the most beneficial. The most common problem with plague farmers is wilt whereas the problem of natural disasters was drought.

2. For relationship between individual basic factors of farmers and income of pineapple farmers, it was concluded that when the number of household members increased, the income of pineapple farmers increased. Due to the agricultural occupation, pineapple growers emphasized the use of physical strength in controlling and supervising each production process. This is different from the study of Putchin (2009) who examines factors affecting household income between agricultural and non-agricultural sectors in Muang District, Chiang Mai province, the number of household members' income had no influence on the level of household income and was negatively correlated. When considering the factors related to the number of years of experience in pineapple planting of the head of the family, it can be concluded that when the head of the family had more years of experience in pineapple planting, the income of the pineapple farmers will increase. This may be due to the fact that most of the total household income comes from pineapple sales. This is coupled with having more professional experience will lead to more professional skills. This is consistent with a study of Putchin (2009) who notes that heads of households had more experience in their primary occupations, resulting in higher household income levels than those having less experience in their primary occupations.

3. For relationship between cost factors, liabilities and sources of funding and income of pineapple farmers, it was concluded that when farmers incurred debt and used to pay households in an increasing amount, it would result in farmers' income. This is different from the results of

Ronnanurak (2015)'s study who highlights that income has a statistically significant positive correlation with debt value. When considering the factor of money invested in farming, it can be concluded that when farmers spend more on their investment in agriculture, both personal and borrowed money, the increase will result in the income of growers. Unlike the study of Plasri (2016) who states that capital has a positive influence on household income from agricultural occupation.

4.For relationship between land utilization and distribution channels of pineapple products and the income of pineapple farmers, it can be concluded that more agricultural land resulted in reducing the income of the pineapple growers. This may be because owning a piece of land is considered an asset and increases the value of a household's wealth. This is different from the results of the study of Naktreepong (2018) who conducts a comparative study on the distribution of household income. It was found that the land ownership condition had no influence on the income. In addition, when considering the factors concerning distribution channels of pineapple products, it can be concluded that farmers who have a specific increase in sales distribution by contracting advance agreements with industrial plants have beneficial in terms of market certainty. This is in accordance with the results of the study of Office of Agricultural Economics (2013) as Eastern pineapple marketing found that 70% of farmers sell their produce with an agreement. Farmers will benefit from market certainty only during the peak period, although prices may be low, they will not lose because they can sell all their produce.

5.For relationship between external environmental factors and income of pineapple farmers, it can be concluded that when the government announced measures to drive exports and expand international markets as a whole and measures to bring excess pineapple out of the system, more frequent increases in the income of pineapple farmers. The results of this study are consistent with the results of a study of Sakrik and Chansukri (2018) who present that when the government has more measures to help farmers during the time when agricultural products are affected, the income after deducting the expenses of farmers increases. Moreover, when considering the factors related to natural disasters, it can be concluded that farmers are facing flooding problems which will result in decrease in income of pineapple farmers. Consistent with the study by Khamwong and Pranawatakun (2011), it was found that the increase in average temperature in the summer and the beginning of the rainy season resulted in decrease in the net income of the agricultural sector.

Recommendations

1. Farmers may not be aware of the benefits from government aid measures. Therefore, the government should support, promote and publicize the agriculture and consumers both in the area and outside the area to be aware of such measures thoroughly.

2. Local farmers may lack understanding of the benefits that will be gained from contracting advance agreements with industrial plants. In this concern, the government should promote and disseminate accurate knowledge and understanding of the principles and benefits of the Agreement Market to the relevant stakeholders including farmers, processing plants, exporters and other relevant government agencies to be aware and aware of its importance. including the need for a market deal.

3. Farmers still face the problem of expensive chemical fertilizers, unstable production prices and the price is very low during the production to the market. Hence, the government should support and encourage pineapple price guarantee. Farmers should be advised to have a production plan to distribute pineapple yields throughout the year with a campaign to have a soil analysis before planting pineapples to adjust the soil accordingly, encouraging of the cultivation of budding shoots to prevent and eliminate fungal diseases, promoting the use of organic fertilizers with chemical fertilizers to improve soil conditions and reduce the use of chemical fertilizers. as well as providing knowledge about the production system and the use of appropriate production technology for pineapple farmers.

Acknowledgements

This research study was accomplished with the administrators of Rajamangala University of Technology Rattanakosin who supported the research budget and assistance until this research is completed.

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