



Factors Affecting the Productivity of Tapioca Industry in the Economic Zone of the Eastern Region of Thailand

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Abstract

Research objectives 1. To study the current situation of cassava cultivation of cassava planter in the special economic zone in the Eastern Region of Thailand Is a quantitative research (Quantitative Research) by using survey research and descriptive research. The sample group used in the research was Tapioca farmers in the special economic zone in the eastern region of Thailand Sampling by the percentage of cassava farmers and according to Taro Yamane's statistical table, 95% confidence level. The sample group was 345 people. The research tool was a questionnaire. Statistics used in the research were percentage, mean, standard deviation.

The research found that

Cassava planter in the special economic zone in the eastern region of Thailand Mostly male Aged between 41–60 years with marital status Have a low education level, a bachelor's degree And have an average annual income between 50,000 - 99,999 baht Source of funds for farmers. Most cassava comes from agricultural cooperatives. When harvesting, the products will be distributed at the purchasing point in the community. As for the sourcing of varieties for planting, most farmers, cassava farmers will keep the original varieties themselves. Because planting of cassava for a period of 11 years or more and the tendency of planting cassava in the future will grow as much as before or may decrease the amount of planting In management to increase the yield of cassava to the cassava industry in the special economic zone in the eastern region of Thailand Overall at a moderate level Sort by order from average to descending as follows 1) Safety 2) Reducing production costs 3) Planning 4) Delivery of products 5) Development and increasing work skills to increase productivity 6) Morale and morale Work 7) Adopting new technology into the production process

Keywords: management, cassava, economic area

Introduction

Cassava is an energy substitute plant of Thailand that is important in the same level with oil and palm. Oil Create value of income into the country Cassava is also important to farmers. Family count including cassava products industry operators until said that cassava is the foundation of Thailand's economic growth. Because cassava is a plant that is easily grown, can be grown in all areas Resulting in almost every region of Thailand can grow cassava as well as being a raw material plant used to transform into an important staple food that requires cassava production. For domestic demand, about 25 percent, the rest is 75 percent which produces a large amount of income for the country. The production of fresh cassava roots in Thailand which is of high quality that is preferred by the international market which Thailand has a production area can adequately meet the needs.

From the fact that cassava is a plant that is easy to grow. Farmers do not give importance to the management of cassava. Therefore resulting in many years ago, the yield per rai was not much expanded Decreased planting area and reduced total yield.

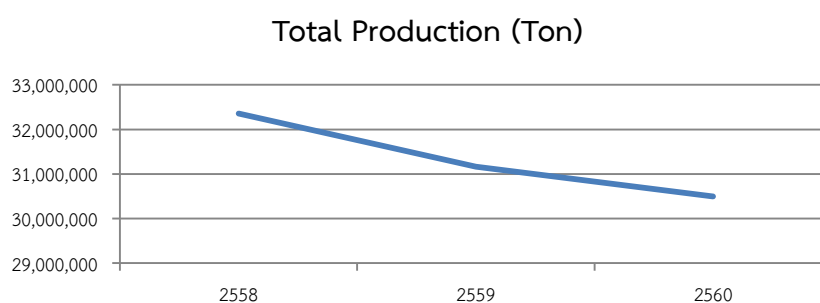


Figure 1 Graph showing data of total cassava production in the country

Source: Office of Agricultural Economics Ministry of Agriculture and Cooperatives (2017)

The impact of the reduction of planted area causing the total production of cassava in 2015 to be produced at 32,357,741 tons in 2016, producing 31,161,103 tons and in 2017, the amount of 30,495,190 tons of cassava production has been reduced continuously. Causing insufficient supply for the cassava industry in Thailand which consists of cassava production. Tapioca processing industry is a line / tablet and tapioca starch including the continuous industries that use products from cassava processing.

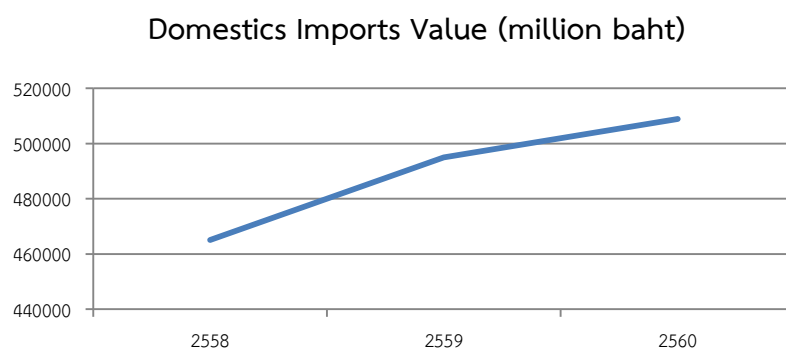


Figure 2 Graph showing the value of cassava imports in the country

Source: Office of Agricultural Economics Ministry of Agriculture and Cooperatives (2017)

During the past 3 years (2015 - 2017), the amount of cassava imports is likely to continue to increase since 2015, worth more than 460,000 million baht and the import value in 2017 has an import value of 508,850 million baht and is expected to increase steadily in the future.

Although Thailand is not the number one tapioca producer in the world. But there is the world's top cassava cultivation area. Moreover, the Thai population does not consume cassava as a carbohydrate source. But has increased the import of cassava continuously shows that the output from cassava cultivation is not enough to meet the needs of people in the country including other industries that use cassava as raw materials and is still an initial processed product. And as raw material for the ethanol production industry, lactic acid production, including the production of new products such as cosmetic products, pharmaceutical products, environmentally friendly cleaning chemicals including the production of biodegradable plastics, polymers with liquid absorption properties for medical health applications, etc. (Thai Tapioca Development Institute Foundation, 2017). Thai cassava cultivation can be grown in every region, every province. The cassava area of the country is 1.98 million rai in the north-east, 4.81 million rai in the central and eastern regions, 2.12 million rai, especially in the eastern region that is the area. In support of business investment both locally and internationally including investment in economic crops that generate income for farmers in the area. Rayong province has an area of 65,360 rai of cassava (Rayong Provincial Agricultural Office, 2017). The province has 229,000 rai of cassava plantation (Chon Buri Provincial Agriculture Office, 2017), Chachoengsao province. 213,994 rai (Chachoengsao Provincial Agricultural Office, 2017) which is the number of areas that can produce cassava very much. If the cassava farmers have good management, can deliver the products to the cassava

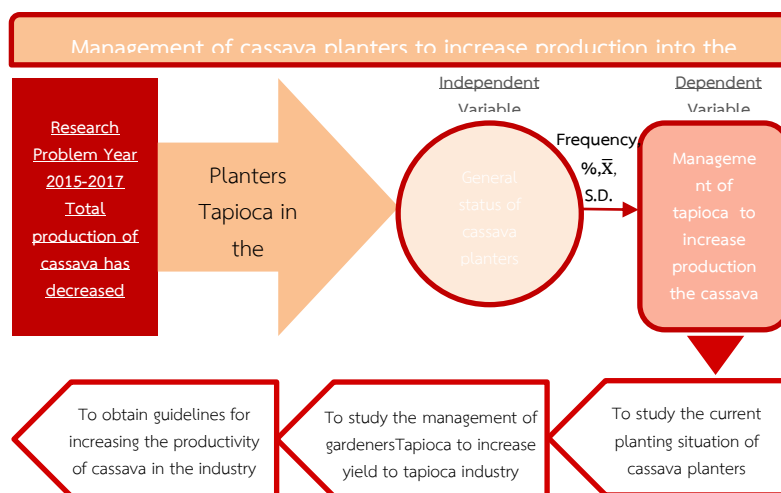
industry. Thailand has no higher import value of cassava. From the importance and problems that arise, the Faculty of Research is interested in researching Management of cassava farmers to increase yields to the cassava industry in the special economic zone in the eastern region of Thailand.

Research objectives

1. To study the current situation of planter cultivation of cassava.
2. To study personal factors affecting the production in the cassava industry in the special economic zone in the eastern region of Thailand

Concept, concept, framework

1. Analysis of the growing situation of cassava farmers in the present.
2. Increasing productivity components to 7 cassava industries (Henry Ford, 1962)
 - 1) Planning (Planning).
 - 2) The introduction of new technology into the planting process (Technology).
 - 3) Development and increase skills in operation to increase productivity.
 - 4) Morale and morale.
 - 5) Cost reduction.
 - 6) Delivery of products
 - 7) Safety





Method Population and Sample

1. The population is cassava farmers in the special economic zone in the eastern region of Thailand, ie Chachoengsao Province, Chonburi Province, Rayong Province.

2. The sample group is cassava farmers in Chachoengsao province. Chonburi province, Rayong province. The method of selecting a sample area, taking into account the probability (Probability Sampling), is a sampling. Easily, allowing every district in the population to be researched will have the opportunity to be chosen as equal examples in all districts. The result is Chachoengsao Province has Phanom Sarakham District There are 1,469 cassava farmers. (Source: Chachoengsao Provincial Agricultural Office, 2017) Chonburi Province Ban Bueng District, There are 611 cassava farmers (source: Chonburi Provincial Agricultural Office, 2017), Rayong province, Ban Chang district. There are 420 cassava farmers (source: Rayong Provincial Agricultural Office, 2017), including 2,500 farmers in cassava, and using sample size calculation based on RVKrejcie and DWMorgan (Thanin, 2014: 49) The total sample size was 345, according to Taro Yamane's confidence level of 95%, divided by the proportion of sample groups according to the percentage of the number of farm planters. Cassava Collecting data from Convenience Random Sampling Groups as follows.

Province	District	Total farmers	Ratio%	Group Example
Chachoengsao	Phanom Sarakham	1,469	$\frac{1,469}{2,500} \times 100 = 59\%$	$345 \times 59\% = 204$
Chonburi	Ban Bueng	611	$\frac{611}{2,500} \times 100 = 24\%$	$345 \times 24\% = 83$
Rayong	Ban Chang	420	$\frac{420}{2,500} \times 100 = 17\%$	$345 \times 17\% = 58$
รวม		2,500	100 %	345

Tools used for data collection

The research team has determined the nature of research tools. And the creation of research tools as follows.

Characteristics of research tools

The characteristics of the tools used in this research are questionnaires which are divided into 3 parts as follows.

Part 1 is a questionnaire about the personal status and situation of the planting of cassava farmers. The questionnaire is a check-list.

Part 2 is a questionnaire about the management of cassava farmers to increase yield to the cassava industry. The questionnaire is a rating scale which has 5 criteria for determining the weight of the assessment according to the Likert method. (Thanin, 2014: 75)



Comment level, weight value, score of choice, answer

The minimum is set to equal 1 point. Less is set to be equal to 2 points. Moderate, set to equal 3 points. Very determined to be equal to 4 points. The maximum is set to equal 5 points. Tools used for data collection.

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Criteria for interpretation of mean scores for average score, opinion level defined as the following scores.

The average score of 1.00 - 1.49 translates to the lowest level of opinion.

The average score is 1.50 - 2.49 translates that there is a low level of opinion.

The average score is 2.50 - 3.49 meaning that there are moderate opinions.

The average score is 3.50 - 4.49 There are opinions at a high level. Average score of 4.50 - 5.00 means There are opinions at the highest level.

- Part 3 is a questionnaire about comments and other suggestions. About the management of the cassava plantation farmers to increase production into the cassava industry. The questionnaire is open-ended.

Creating research tools

Tools used in this research. The research team has created a questionnaire. Questionnaire is divided into 6 steps in the following order

1. Study of questionnaires from relevant research to create a questionnaire.
2. Conducting a draft questionnaire.



3. The research team adopted a draft questionnaire created with the evaluation form to experts. There has knowledge and experience in the field of study, considering 3 questionnaires in order to test the accuracy. Content coverage and accuracy in language idioms once the expert has reviewed the assessment form. The faculty therefore used the evaluation form to calculate the accuracy of the questionnaire in terms of the appropriateness of the content and the correctness in the language idioms. Used as a guideline for improving the query. Then, the research team adopted a draft questionnaire that had been modified by experts and then tried-out with the group of cassava farmers at Wang Chan District, Rayong Province, 30 sets to calculate the power, discrimination and confidence values of the draft questionnaire before actual use.

The tools used to collect data in this research are questionnaires divided into 3 parts:

Part 1 Information about the current situation and general conditions of cassava farmers.

Part 2 Management information of the cassava planters as follows: The research team gave the respondents.

Part 3 General Recommendations.

How to create tools

Tools used in this research Created according to the following methods.

1. Determine the purpose of creating tools.
2. Study current situation, related research textbooks.
3. Create tools for collecting data including questionnaires.
4. Bring the tools created to consult the experts to check the accuracy and completeness.
5. Bring the tools that have been checked by experts and further modified and then taken to Try out.

Data collection

The research team has implemented a questionnaire that has been updated and collected data. By taking a questionnaire and go out to the cassava farmers in the research area.

1. The research team collects data by doing the distribution and requesting the return of the questionnaire, with 5 research assistants distributing the questionnaire.

2. The research team understood and asked about the scope of research. And how to use the tool. Let the research assistants distribute the questionnaire to understand every step.

3. Research faculty and research assistants Bring questionnaires to collect data with a sample of 345 sets between 1 July 2017 - 30 September 2017.

Data analysis

The research team conducted data analysis in the following steps.

1. Take the questionnaire to determine the query code And scores based on scoring criteria.
2. Put scores to analyze statistics with a computer. By using the software package via computer.
3. The research team presented the research results according to the objectives and the conceptual framework of the research by Use tables and descriptions.

Statistics used in data analysis

1. Basic statistics include
 - 1.1 Percentage
 - 1.2 Mean value (Mean)
 - 1.3 Standard Deviation
 - 1.4 Finding the quality of the questionnaire By finding the confidence value (Reliability) By using the alpha coefficient of Cronbach
- 2 statistics used in data analysis Use descriptive statistics to describe personal information of respondents.
3. Comparison of cassava farmers to increase productivity in the cassava industry classified by personal status in terms of gender, age, status, education level and income by using difference analysis with t-test for gender status. And using anova analysis of variance to analyze the differences of variables by group for variables, age, status, education level and income. There will analyze the individual group differences again by using Scheffe analysis.

Research result

The overall research results that are in accordance with the objectives of the research set In the following order

1. Cassava planter in the special economic zone in the eastern region of Thailand Mostly male Aged between 41–60 years with marital status Have a low education level, a bachelor's degree And have an average annual income between 50,000 - 99,999 baht Source of funds for farmers. Most cassava comes from agricultural cooperatives. When harvesting, the products will be distributed at the purchasing point in the community. As for the sourcing of varieties for planting, most farmers, cassava farmers will keep the original varieties themselves. Because planting of cassava for a period of 11 years or more and the tendency of planting cassava in the future will grow as much as before or may decrease the amount of planting



2. Opinions on the management of cassava farmers to increase overall productivity at a moderate level When classified in each aspect, it was found that the aspect of cassava farmers managed to increase productivity in the order from the highest to the least is safety. Production cost Planning on the delivery of raw materials in the development and enhancement of operational skills to increase productivity Morale of work And the introduction of new technologies into the production process respectively

3. The opinions of male and female cassava farmers on the management of cassava farmers to increase productivity Classified by personal status, sex found that. In the planning of working methods for cassava planters, male and female opinions that Cassava farmers should be planned before the most work.

The introduction of new technology into the production process of cassava planters, male and female, have an opinion that Cassava farmers should use mechanical equipment as a tool to prepare the area before planting as much as possible.

In the development and enhancement of work skills to improve cassava farmers Males and females have opinions that Cassava farmers should use their knowledge and expertise to develop their products to maximize the production of cassava.

Morale of work Cassava farmers, male and female, have opinions that Tapioca farmers should have a group of cassava farmers to organize the project to promote the greatest productivity.

In reducing the cost of production Cassava farmers, male and female, have opinions that Cassava farmers should use organic fertilizers to reduce costs as much as possible.

4. Opinions of cassava farmers at each age level on the management of cassava farmers to increase productivity Classified by personal status, age

Regarding the plan of the cassava planter work, there was no difference with the opinion that it should be planned before the most work.

The introduction of new technology into the production process of cassava farmers aged 21 - 40 years, cassava farmers aged 41 - 60 years, saw that cassava farmers should use mechanical equipment as a tool to prepare the area before planting as much as possible. As for cassava farmers aged 61 years and over, see that cassava farmers should use technology to help manage In order to achieve efficient work as a quick system

In the development and improvement of work skills for better, tapioca farmers have different opinions that should use knowledge and expertise to develop the production to increase cassava yield.

Morale of work Cassava farmers aged 21 - 40 years saw that cassava farmers should have the products from cassava cultivation to meet the most targeted goals.

Reducing production costs or services Cassava farmers aged 21 - 40 years old cassava farmers aged 41 - 60 years saw that cassava farmers should use organic fertilizers



to reduce costs as much as possible. As for cassava farmers aged 61 years and over, see that tapioca farmers should adopt renewable energy technology to help reduce operating costs as much as possible.

5. Opinions of each status of cassava farmers with the management of cassava farmers to increase productivity, classified by personal status, status Regarding the plan of working, the farmers of each status are not different. With the opinion that Cassava farmers should be planned before the most work. Regarding the introduction of new technology into the production process, each status of cassava farmers is no different. With the opinion that should be used as a mechanical device to prepare the area before planting as much as possible.

In the development and improvement of working skills for better, cassava farmers who are single Tapioca farmers should have a group of cassava farmers to organize the project to promote the greatest productivity. As for cassava farmers who have marital status and cassava farmers who are widowed / divorced / separated, see that tapioca farmers should use their knowledge and expertise to develop the job to maximize cassava yields. Morale of work each cassava farmer is no different. With the opinion that Cassava farmers should not have too much pressure during work.

Reducing production costs or services Single cassava farmers Cassava farmers with marital status And cassava farmers who are widowed / divorced / separated, see that cassava planters should use organic fertilizers to reduce costs as much as possible.

6. Opinions of each level of cassava farmers with the management of cassava farmers to increase productivity, classified by personal status, educational level.

Regarding the plan of working for each level of cassava farmers, it was found that there was no difference in opinions of cassava farmers, which should be managed in terms of sharing in the community in order to meet the needs of the market as much as possible.

Regarding the introduction of new technologies into the production process of each level of cassava farmers, the study found that there was no difference in opinions of cassava farmers.

Development and increasing skills in increasing productivity each level of study found that there was no difference in opinions of cassava farmers. Knowledge and expertise should be developed to increase the production of cassava as much as possible.

Morale of work each level of cassava farmers found that there was no difference in opinions. Tapioca farmers should not have too much pressure during work.



In reducing the cost of production each level of tapioca farmers found that there was no difference in opinions. Cassava farmers should use organic fertilizers to reduce costs as much as possible.

7. Opinions of farmers in each level of income with the management of cassava farmers to increase productivity Classified by personal status in income
Regarding the plan of working for each level of cassava farmers, it was found that the opinions of cassava farmers should not be developed in order to obtain the greatest yield.

Regarding the introduction of new technology into the production process of cassava farmers at each level of income, it was found that there was no difference in opinions of cassava farmers.

In terms of development and increasing skills in working to improve cassava farmers at each level of income, it is found that there is no difference in opinions of cassava farmers.

In terms of morale and morale in the work of cassava farmers at each level of income, it was found that the opinions of cassava farmers should not be too much pressure during work.

In reducing the cost of production Cassava farmers with income of 1-49,999 baht see that cassava farmers should use organic fertilizers to reduce costs as much as possible. As for cassava farmers with income 50,000-99,999 baht and cassava farmers with income of 100,000 baht or more, see that cassava farmers should use organic fertilizers to reduce costs. And cassava farmers should use renewable energy technology to help reduce operating costs as much as possible.

The results of comparison of differences in mean score of cassava farmers' opinions Classified by personal status in various areas as follows

1. Male and female cassava farmers who there is no different opinion on the management of cassava farmers in order to increase overall productivity and each aspect.

2. Cassava farmers at each age level have opinions on the management of cassava farmers to increase overall productivity. And each aspect in the improvement of working methods, the introduction of new technologies into the production process, the development and the improvement of operational skills, and the workers with better quality of life are different Statistical significance at the level of .05 In terms of cost reduction in production or service, there is no different opinion.

3. Tapioca farmers, each status which there is a level of opinion on the management of cassava farmers to increase overall productivity. And each aspect in the planning of work and development and increasing the skills to perform the job better with statistical significance at the level of .05 As for the introduction of new technology

into the production process, workers have a better quality of life. And cost reduction in production or service which there are no different opinions.

4. Cassava planter for each level of education Have opinions on the management of cassava farmers to increase overall productivity And in the areas of planning, work development, and improving skills in working better And the workers have a better quality of life Differing in statistical significance at the level of .05. As for the introduction of new technologies into the production process and the cost reduction in production or service has no different opinions

5. Tapioca farmers, each level of income Have opinions on the management of cassava farmers to increase overall productivity And each aspect in improving the working method in applying new technology to the production process in the development and increasing the skills to perform the job better with statistical significance at the level of .05 As for the workers, the quality of life has improved. And the cost reduction in production or service has no different opinions

Summary and discussion of results

The important issues found from the research are as follows.

1. From the results of the research found that Cassava farmers have opinions on the management of cassava farmers to increase yields to the cassava industry in the special economic zone in the eastern region of Thailand. And considering each aspect, it was found that the most important aspect of cassava farmers was safety. By which the most important tapioca farmers are Having knowledge or being trained on organic standards or other standards associated Because it is close to industrial plants and production areas, the use of chemicals or hazardous substances in agriculture Causing the cassava farmers who want to have increased productivity, are concerned Because that means being prepared and careful, from the preparation process, planting, the environment to the maintenance, especially the application of organic fertilizer and bio-fertilizer to replace the chemical fertilizer and not cause Endanger the long term health of the farmers Including having expertise in the use of equipment Driving the tractor must be safe. To make it easier and faster to work and to obtain the desired output The importance of the management of cassava farmers in this safety is consistent with Agricultural Product Standards Act (2010: 2) which has determined the use of agricultural hazardous substances If there is a need to use agricultural hazardous substances, the worker must have the knowledge to use it correctly. Used in accordance with the recommendations of the Department of Agriculture Ministry of Agriculture and Cooperatives or labels that are properly registered with the Department of Agriculture and must be careful not to contaminate Public water source



2. From the results of the research, it was found that the cassava farmers had opinions on the management of cassava farmers to increase the productivity in the cassava industry in the special economic zone in the eastern region of Thailand. The overall picture is at a moderate level. And in accordance with the research of Wanlop Thong-On (2016) that found that increasing the production of cassava that can create knowledge for farmers in every step of the production of cassava in 7 areas, namely, varieties and selection of varieties. In planting and planting planning methods Soil improvement and soil preparation in the field of weeding, weeding and the use of fertilizers and proper harvesting.

3. From the results of the research found that Management of cassava farmers to increase productivity in the cassava industry in the special economic zone in the eastern region of Thailand. At a moderate level Which is consistent with the research of Phatthikapol Saaku (2015) that found that building confidence for farmers about land use planning for sustainable cassava cultivation Crop Switching and marketing management to be appropriate According to the suitability of the area

4. From the results of the research found that Cassava farmers, male and female who there is a level of opinion on the management of cassava farmers to increase the yield to the cassava industry in the special economic zone in the eastern region of Thailand. In development and increasing skills in increasing productivity at a high level And cassava farmers, male jobs Commented Cassava farmers should use their knowledge and expertise to develop their products to maximize the production of cassava. Which is consistent with Natthanat (2012) and Powers (2012) that found that most farmers have the need to improve cassava production significantly. And considering each aspect in 6 aspects, there is a need for development in all aspects, namely, varieties, knowledge and skills to increase productivity. Planting area Harvesting Care and selection of planting areas

Suggestion

General suggestions

1. Provincial Agricultural Office in the Special Economic Zone in the Eastern Region of Thailand Should provide training to educate and develop the ability of the farmers. In order to increase yield and efficiency

2. The farmer should have a plan before proceeding to work every time. And study marketing information including techniques for growing cassava in order to increase work efficiency and increase product quality and sufficient to meet market demand



Suggestions for further research

1. Research on the introduction of new technology systems for farmers to reduce costs and increase productivity for cassava farmers.
2. Research on the management model to increase the productivity of tapioca farmers effectively by including the whole country.

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