Cost and Return Analysis of Planting Homthong Bananas in Phitsanulok Province

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Abstract

The purposes of The research were 1) to investigate cost and revenue from planting Homthong Bananas in Phitsanulok Province 2) toanalyze the return from planting Homthong Bananas in Phitsanulok Province 3) to study the inherent problems and threats from planting HomthongBananasin Phitsanulok Province, of the year B.E. 2562.The research used the purposive sampling from 30 agriculturists. The data were collected by interviewing with structured interview. Statistics were frequency and percentage. Cost and Return analysis used Return on Investment (ROI), Benefit Cost Ratio (BCR) and Net Profit Margin (NPM) which using the descriptive analysis presented information.

The research found that planting Homthong Bananas of the agriculturists which had the first investment of 44,261.65 baht per rai per year which agriculturists got revenues after planting about 10months. After agriculturists had received income from sale of Homthong Bananas, they had the average total cost of 22,656.91 baht per rai per year which consist of fixed cost of 5,399.71 baht per rai per year and variable cost of 17,257.20 baht per rai per year. Agriculturists had the total revenue of 50,285.29 baht

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per rai per year, withthe net profit of 27,628.38 baht per rai per year. The yields from planting Homthong Bananasof Agriculturists had Return on Investment (ROI) of 13.6%, Benefit Cost Ratio (BCR) of 2.22 and Net Profit Margin (NPM) of 54.94%. The inherent problems and threats on planting Homthong Bananas were strong wind, which cutting the Homthong Bananas followed by lack of water for cultivation, Long drought and lack of fertility.

Keywords : Cost and Return, Homthong Bananas, Phitsanulok

Introduction

Thailand is an agricultural country. More than 70% people directly or indirectly depends on agriculture.Although the world situation will be changed, Thailand's agriculture is still important to the livelihood of the population in the country which helping to drive and develop the economy of the country. Principles of the Twelfth National Economic and Social Development Plan (2017-2021) which the Twelfth Plan is based upon the principles of the “Sufficiency Economy Philosophy” which has been a vital foundation since the Ninth Plan. In order to build strengthen immunity, appropriate risk management for resulting in balanced and sustainable development of the country. (Office of the Prime Minister, 2016)

The utilization of the Sufficiency Economy Philosophy to be used in the agricultural sector of Thailand can be the most clearly applied. In addition to agriculturists cultivated for their own consumption, they could also be sold. Exports of Thai agricultural products tend to increase every year.In 2018, Thailand exported agricultural products of 744,433.5 million baht. For the end of the year 2019, the office agricultural economy analysis to the agricultural economy in the year 2019 found that the expansion of 0.5% compared to year 2018 which the main agricultural products of Thailand are exported which are rice, rubber, cassava, durian, mangosteen and banana, etc.(Office of Agricultural Economics, 2020)

Thailand is one of the important banana productionareas in the world. There are manyvarieties of bananas. Thai agriculturists prefer to plant banana due to their low

production cost. Cultivation and treatment methods that were easy giving fast productivity which able to grow well in Thailand. Bananas that most agriculturists which like to plant were hard-shelled banana (kluai hin), pisang mas banana (kluai khai), cultivated banana (Kluai nam wa) and banana (Homthong Bananas). (Supakitjaroen, 2013)

Homthong Bananas was one of the main fruits in Thailand that were agricultural products exported to foreign countries and cultivation for both domestic and international trade which created income to develop the country. Homthong Bananas had a beautiful golden yellow skin, good taste, and had a pleasant aroma. Therefore, Homthong Bananas was popular for both domestic and international consumers. Planting Homthong Bananas can be grown in certain area of Thailand. Because Homthong Bananas like hot and humid weather and like the area with constant weather. The soil to grow Homthong Bananas should be loamy, not flooded water.Pathum Thani Province and Phetchaburi Province were the most famous for planting and distributing Homthong Bananas.Phitsanulokis a province that has an area suitable for growing Homthong Bananas which has grown banana for the main occupation and supplementary career. (Mejang, 2010)

Although Homthong Bananas had economic value the statistics of agriculturists who were registering at the Phitsanulok Provincial Agricultural Extension Office all 9 districts which there were only 62 registeringagriculturists and the total planting area were 265.56 rai.Cultivated Banana (Kluai nam wa) was popularly grown in Phitsanulok Province which the area of cultivation was 18,260 rai. Proportion of plantingbetween Homthong Bananas and Cultivated Banana (Kluai nam wa) was 1.45%. (Phitsanulok Provincial Agricultural Extension Office, 2018)

Due to proportion of planting between Homthong Bananas and Cultivated Banana (Kluai nam wa) was very small despite Homthong Bananas have economic value and Phitsanulok Province is a suitable area for planting Homthong Bananas. Hence, it is the source of the problems in this research that the condition ofplanting Homthong Bananas in Phitsanulok province such ascost, return, problems and threats.

Research Objectives

1. To investigate cost and revenue from plantingHomthong Bananas in Phitsanulok Province.

2. To analyze the return from planting Homthong Bananas in Phitsanulok Province.

3. To study the inherent problems and threats from planting Homthong Bananasin Phitsanulok Province.

Conceptual Framework

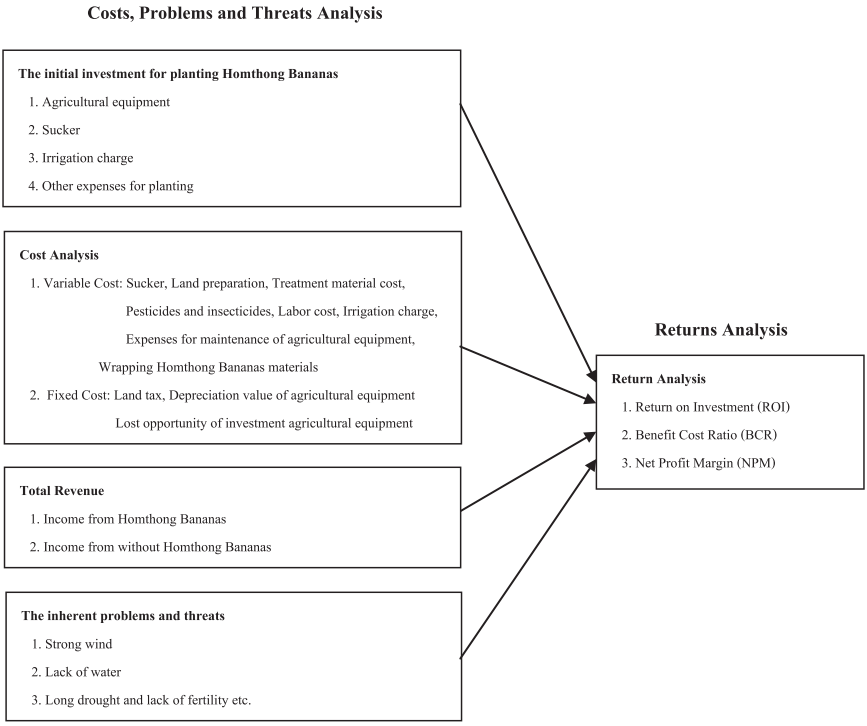

Figure 1 Conceptual Framework

Expected Results

1. Knowing cost and return of planting Homthong Bananas in Phisanulok Province.

2. Knowing guidelines for solving inherent problems and threats of planting Homthong Bananasin Phitsanulok Province.

3. Information in this research that used for decision and guideline for a person who interested in studying to invest about planting Homthong Bananas.

Theoretical Foundation and Relevant Literature Reviews

Cost and Return analysis of planting Homthong Bananasin Phitsanulok Provincethatresearcher studied the concepts, theories and relevant literature reviewsaccording to the following important issues:

Cost concept

Thisresearch used the short-run cost analysis that it had 2 types of production factors which consisted of fixed factors and variable factors. Production cost that consisted of variable cost and fixed cost.(Meeampol, 2017)

1) Variable cost was production cost that change according to the amount of production. The variable cost was arising from using of variable factors during production. Kamal, Ali & Alam (2015) studied cost and return analysis of banana in Bogra, Bangladesh that variable cost were sucker/seeds cost, bamboo cost, human labor cost, animal and mechanical power cost, fertilizer cost, insecticides, irrigation charge. Mamutipong, Jareanjiratragul, Tongrak & Cherdchom (2010) studied cost-return analysis of banana (ABB Group-Kluai Hin) production in Yala Province that variable cost were labor cost, sucker, manure, chemical fertilizer, expenses for maintenance of agricultural equipment and lost opportunity of investment. Nujnetra & Pheratkul (2013) studied cost and return on investment of Kloyhomthongbanlad that variable cost were sucker, fertilizer, electivity, fuel and lubricant, land preparation, wrapping and labor cost. In this research variable cost consisted of sucker, land preparation, treatment material cost, pesticides and insecticides, labor cost, irrigation charge, expenses for maintenance of agricultural equipment andwrappingHomthong Bananas materials.

2) Fixed cost was production cost that did not change with the amount of production. Mukul & Rahman (2013) studied production and profitability of banana in Bangladesh that fixed cost were land value, interest on working capital. Nujnetra & Pheratkul (2013) studied cost and return Kloyhomthongbanlad that fixed cost wereland tax and lost opportunity of investment agricultural equipment. Bondar, Daundkar & Khedkar(2015) studied economics of production of banana in Kolhapur district of Maharashtra that fixed cost were rental value of land and interest on fixed capital.Nwaiwu, Eze, Amaechi & Osuagwu (2012) studiedproblems and prospects of large scale plantain banana (Musa Spp) production in Abia State, Nigeria which fixed cost were cost of management, depreciation value of agricultural equipment and stall rent.Inthis research fixed cost consisted of land tax, depreciation value of agricultural equipment and lost opportunity of investment agricultural equipment.

3) Total cost was the summation of all variable cost and fixed cost. Equation for calculating of total cost which showed the equation as follows:

$$TC = TVC + TFC$$

Where

TC = Total Cost

TVC = Total Variable Cost

TFC = Total Fixed Cost

Return Concept

Return was revenue or income, dividends or profits from investment.In this research revenues were income from distributing both productivity Homthong Bananas and without productivity.

Inherent problems and threats

Inherent problems and threats mean obstructions that prevent processing work from achieving their goals or plans. Harry & Antonio (2017) said that inherent problems and threats were poor knowledge on production activities, poor common service facilities, poor road condition (farm-to-market roads), undesirable weather condition, insufficient

capital, declining productivity of banana farms, less empowered farmers, low quality of banana produced and insufficient support from enablers. Panyarpisit (2018) studied cost and return of Kluai Hom Thong Pathumrat in Pathum Thani Province which inherent problems and threats for planting banana werebacterial wilt, leaf spot, potato leafroll virus and natural calamity. Nwaiwu, Eze, Amaechi & Osuagwu (2012) studiedproblems and prospects of large scale plantain banana (Musa Spp) production in Abia State, Nigeria whichinherent problems and threats werefrequent and long period of drought, lack of storage facilities, myriads of marketing challenges, incidence of pests and disease infestation, and the menace of wind storm. The inherent problems and threats in this research werestrong wind, lack of water, long drought and lack of fertility, etc.

Related Research

Kumar & Nishad (2018)studied on cost and return structure on sample farm in Durg district, Chhattisgarh state, India. The research found that the average size of land holding in small size group was 9.19 rai (1.47 hectare) and 23.25 rai (3.72 hectare) medium and 45.69 rai (7.31 hectare) in large size group, respectively. The productivity of banana was higher in small size group followed by medium and large size group. The research found that the total revenue of small size area of 28,224 baht per rai (392,000 Indian Rupee per hectare), the total cost of 14,328.53 baht per rai (199,007.33 Indian Rupee per hectare), net profit of 13,895.47 baht per rai (192,992.67 Indian Rupee per hectare) and BCR of 1.96. The total revenue of medium area of 27,468baht per rai (381,500 Indian Rupee per hectare), the total cost of 14,491.77 baht per rai (201,274.65 Indian Rupee per hectare), net profit of 12,976.23 baht per rai (180,225.35 Indian Rupee per hectare) and BCR of 1.8. The total revenue of large area of 26,838 baht per rai (381,500 Indian Rupee per hectare), the total cost of 14,570.72 baht per rai (202,371.07 Indian Rupee per hectare), net profit of 12,267.28 baht per rai (170,378.93 Indian Rupee per hectare) and BCRof 1.84. The average total revenue of all three planting areas of 27,510 baht per rai (382,083.33 Indian Rupee per hectare), the average total cost of 14,463.68 baht per rai (200,884.51

Indian Rupee per hectare), the average total net profit of 13,046.32 baht per rai (181,198.82 Indian Rupee per hectare) and BCR of 1.90.

Boonchouy (2017) studied cost and return of planting cultivated banana in Tha Yang district, Phetchaburi Province. The research found that farmers had the first investments of 33,884.55 baht, total cost of 20,184.55 baht and total revenues of 25,728.57 baht which, net profit of 5,544.02 baht and the return of to grow Cultivated Bananas average per rai per year, the rate of profit to net sales of 21.55% and ROI of 16.36% and farmers hadtaken1 year and 6 months for getting pay back the investment.

Lalaeng (2016) studied cost and return and production efficiency of economic with three types of crops in the South of Thailand which consisted of palm oil, rubber and coffee. Project time was 25 years for palm oil and rubber and 15 years of coffee which using a discount rate of 12% per year. Research results of cost and benefits, palm oil, NPV of 380,669.4 baht and IRRof 14.51%. Rubber, NPVof 832,503.57 baht andIRRof 10.56%. Coffee, NPV of 458,839 baht andIRR of 16.6%. Research results of technical efficiency analysis: production efficiency of palm oil of 94.18%, production efficiency of rubber of 87.62%, and production efficiency of coffee of 87.62%.

Bondar, Daundkar & Khedkar (2015) studied economics of production of banana in Kolhapur district, Maharashtra state, India for the year 2012-2013. The average total revenueof 40,628.49 baht per rai (564,284.57 Indian Rupee per hectare), the average total cost of 19,647.07 baht per rai (272,876 Indian Rupee per hectare), the average total net profit of 20,981.42 baht per rai (291,408.57 Indian Rupee per hectare) and BCR of 2.07.

Chaiyesh (2015) studied cost and return on souvenir products of Ban Nong Takai silk weaving group, Buriram Province which investigated about the cost and revenue, analyze the return and analyze break-even point of the year B.E. 2553. The findings revealed that of 498 pieces sold out were totally of 314,260 baht of revenue from total of 293,127.50 baht of cost. The cost involving souvenir products from silk included of direct material cost, direct labor cost, manufacturing overhead, and selling and administrative expenses; two of forth was direct material cost. Considering the return gained under the two conditions, it found that there was very different because direct labor cost was relatively high. It was 31.02% of total cost. In case of cost including direct

labor, ROI of 5.19%, NPM of 6.72%, BEP of sale revenue of 87,215.69 baht and BEP of sale volume of 91.40 pieces. On the other hand, in case of cost excluding direct labor, ROI of 35.40%, NPM of 35.66%, BEP of sale revenue of 40,018.97 baht and BEP of sale volume of 41.94 pieces.

Prasongdai (2014) studied financial cost and benefits analysis of a Jasmine Rice-105 and Ko Kho-6 rice seed production project at Sakon Nakhon Rice Seed Center. Research results of cost and benefits that yielded these results: NPVof 13,674,793.12 baht, IRR of 17% and BCR of 1.30. The production of Ko Kho-6 Rice yielded these results: NPV of 500,471.64 baht, IRR of 13% and BCRof 1.06.

Sriha-gao (2014) studied financial benefit andcost analysis for potatoes process of Mae - Krua Chedi agriculturist housewives group in Mae Faek Mai district, Sansai, Chiang Mai Province. The results of the study showed that the cost of investment of potatoes products of 32,700 baht, the cost of products of potatoes of 8,921,282.33 baht and the operation cost of potatoes products of 677,929 baht, NPV of 1,037,915.66 and PBP was 1 year 4 months.

Mukul & Rahman (2013) studied production and profitability of banana in Bangladesh an economic analysis which determined relative profitability of banana in Narsingdhi state, Bangladesh. The research found that farmers had total revenue of 11,396.53 baht per rai (192,509 Bangladesh Taka per hectare), total cost of 8,140.41 baht per rai (137,507 Bangladesh Taka per hectare) which consisted of variable cost of 4,238.72 baht per rai (71,600 Bangladesh Taka per hectare) and fixed cost of 3,901.69 baht per rai (65,907 Bangladesh Taka per hactare). Net profit of 3,256.12 baht per rai (55,002 Bangladesh Taka per hectare) and the average BCR of 1.40.

Nujnetra & Pheratkul (2013) studied Kluaihomthongbanlad : production cost and return on investment which studied Kluaihomthongbanlad production of farmers in the sub-district of Tamrong, Raisathon Talu and Nongkrached, Banlad district, Phetchaburi. The research found that, in Banlad district, the highest yield in both quantity and value was Tamrong with the PBP was 1 year 6 months 19 days, NPV of 1,431,845.62 baht and IRRof 42.78%. PBPwas 1 year 9 months 18 days, NPV of 734,872.21 baht and IRR of 31.42% were Nongkrached. And also, Tamlu got PBP 2 years 2 months 3 days, NPV of 294,775.16 baht and IRR of 18.79%.

Nwaiwu, Eze, Amaechi & Osuagwu (2012) studied problems and prospects of large scale plantain banana (Musa Spp) production in Abia state, Southeast Nigeria. The results showed that the total revenue of 3,817.03 baht per rai (280,663.66 Nigerian Naira per hectare), the total cost of 1,799.51 baht per rai (132,317.23 Nigerian Naira per hectare), the total net profit of 2,017.51 baht per rai (148,346.43 Nigerian Naira per hectare), BCR of 2.12 and ROI of 1.12. The major problems militating against plantain banana production in the study area were the frequent and long period of drought, myriads of marketing challenges, lack of storage facilities, incidence of pests and disease infestation, and the menace of wind storm.From the related research that had been studied, there were many methods to assess the return on investment as follows.

Table 1 Summary of assessing return on investment methods.

Author	Assessing return on investment methods								
	Revenue-Cost-Profit	NPV	IRR	ROI	PBP	BCR	PI	BEP	NPM
Kumar & Nishad (2018) studied on cost and return structure on sample farm in Durg district, Chhattisgarh, India	✓					✓			
Boonchouy (2017) studied cost and return of planting cultivated Banana in Tha Yang district, Phetchaburi province	✓	✓		✓	✓				✓
Lalaeng (2016) studied cost and return and production efficiency of economic with three types of crops in the South of Thailand	✓	✓	✓	✓					
Bondar, Daundkar & Khedkar (2015) studied Economics of production of banana in Kolhapur district, Maharashtra state, India	✓					✓			
Chaiyesh (2015) studied cost and return on souvenir products of Ban Nong Takai silk weaving group, Buriram province	✓			✓				✓	✓
Prasongdai (2014) studied financial cost and benefits analysis of a Jasmine Rice-105 and Ko Kho-6 rice seed production project at Sakon Nakhon Rice Seed Center	✓	✓	✓			✓			

Table 1 (Cont.)

Author	Assessing return on investment methods								
	Revenue-Cost-Profit	NPV	IRR	ROI	PBP	BCR	PI	BEP	NPM
Sriha-gao (2014) studied financial benefit - cost analysis for potatoes process of Mae - Krua chedi agriculturist housewives group in Mae Faek Mai district, Chiang Mai province	✓	✓	✓		✓				
Mukul & Rahman (2013) studied production and profitability of banana in Bangladesh, Narsingdhi state, Bangladesh	✓					✓	✓		
Nujnetra & Pheratkul (2013) studied Kloyhomthongbanlad : production cost and return on investment	✓	✓	✓		✓				
Nwaiwu, Eze, Amaechi & Osuagwu (2012) studied problems and prospects of large scale Plantain Banana (Musa Spp) production in Abia state, Nigeria	✓			✓		✓			

Summary of methods for assessing return on investment as table 1 for this research used 3 methods of assessing return on investment which popular methods for making investment assessment decisions, including: Return on Investment (ROI), Benefit Cost Ratio (BCR) and Net Profit Margin (NPM).

Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or compare the efficiency of a number of different investments. ROI tries to directly measure the amount of return on a particular investment, relative to the investment's cost. To calculate ROI, the benefit (or return) of an investment is divided by the cost of the investment. The result is expressed as a percentage or a ratio. The return on investment formula is as follows:

$$\text{Return on Investment (ROI)} = \frac{\text{Current Value of Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

Benefit Cost Ratio (BCR) is a ratio used in a cost-benefit analysis to summarize the overall relationship between the relative cost and benefits of a proposed project. The Benefit Cost Ratio (BCR) formula is as follows:

$$\text{Benefit Cost Ratio (BCR)} = \frac{\text{Total Revenue}}{\text{Total Cost}}$$

Net Profit Margin (NPM) is a measure of profitability. It is calculated by finding the net profit as a percentage of the revenue. The Net Profit Margin (NPM) formula is as follows:

$$\text{Net Profit Margin (NPM)} = \frac{\text{Net Profit}}{\text{Total Revenue}}$$

Research Methodology

Population Acquisition and Sample Selection

The population in this research was the agriculturists 62 persons who planted Homthong Bananas in Phitsanulok Province, which had been collected from Phitsanulok Provincial Agricultural Extension Office. In this research used a purposive sampling 30 agriculturists in Muang district 20 persons and Bang Krathum district 10 persons which the samples selection criteria that wereagriculturists who had direct experience. Muang district had the most of agriculturists planting Homthong Babanas and Bang Krathum district was a leading district in banana growing in Phitsanulok Province. For a list of agriculturists were supported by Phitsanulok Provincial Agricultural Extension Office.

Research Instrument

The research instrument used for collecting research data were structured interview which consisted of 4 parts as follows.

Part 1 General information of agriculturists

Part 2 Information about the cost from planting Homthong Bananas of agriculturists

Part 3 Information about the return from planting HomthongBananas of agriculturists

Part 4 Information about the inherent problems and threatsfrom planting Homthong Bananas of agriculturists.

This structured interview is an interview with answers for the samples to write their own answers and from the interview.The interview had the only answer and more than one answer (Multiple Choices) and there were definite answers which chose between 2 answers (Dichotomous). For the interview information that was interviewed and recordeddata by researcher.

Data Collection

Data collection that the researcher performed the following steps:

1. Request a letter from the Faculty of Management Science Pibulsongkram Rajabhat University in order to request a list of agriculturists who registered to plant HomthongBananas at Phitsanulok Provincial Agricultural Extension Office.

2. Bring a letter to Phitsanulok Provincial Agricultural Extension Office in order to request a list of agriculturists who planting Homthong Bananas in Phitsanulok Province.

3. Data were collected by researcher which visited and interviewed the agriculturistsin Muang district and Bang Krathum district, Phitsanulok Province 30 personswhich the interview topic were general information agriculturists, cost and return form planting Homthong Bananas of agriculturist and the inherent problems and threats from planting Homthong Bananas of agriculturist.

Data validation

Cost and return analysis of planting Homthong Bananas in Phitsanulok Province is Qualitative Research whichis focused on the main accuracy and reliability of data.Data validation before analysis which must check the information both while entering area for collecting the data and after collecting data in order to determine the information was accurate and reliable sufficient to answer the research question or not.Data validation in qualitative research popular used the Triangulation Method. Flick (2002) identified four basic types of triangulation as follows:

1. Data Triangulation involves time, space, and persons which using different sources of data. This includes different times for data collection, difference places from

which to collect the data, and different people who could be involved in the research study.

2. Investigator triangulation involves multiple researchers in an investigation which using several people (or at least more than one) in the data gathering and data analysis processes. This would be a systematic comparison of different researchers' influences on the issue and the results of the research.

3. Theory triangulation involves using more than one theoretical scheme in the interpretation of the phenomenon whichapproaching the data with multiple theories or perspectives in mind to extend the possibilities for producing knowledge.

4. Methodological triangulation involves using more than one method to gather data, such as interviews, observations, questionnaires, and documents which having two subtypes are noted - within-method and between-method. Using morethan one method to gather data.

Data Analysis

1. Descriptive analysis is an analysis in order to know the general characteristics of agriculturists, the management of planting Homthong Bananas and inherent problems and threats in Phitsanulok Province.Statistics analyzed were frequency and percentage.

2. Cost and Return analysisused for making investment assessment decisions, including: Return on Investment (ROI), Benefit Cost Ratio (BCR) and Net Profit Margin (NPM) in order to analyze the cost of planting banana of agriculturists in Phitsanulok Province to determine the return worth the investment or not.

Results

General information of agriculturist

This study was initiated to conduct detail of an general information of agriculturist who planting Homthong Bananas in Phitsanulok Province that based on primary data collection through a survey of Homthong Bananas growers. General information of agriculturistswas as follows:

Age

Age groups of selected agriculturists in the study area that 50% of agriculturists belonged to the age group of 61 and above years, followed by 30% agriculturists belonged to the age group of 41-45 years and while 20% belonged to the age group of 51-60 years.

Education

Education level of selected agriculturists in the study area thateducation level 50% agriculturists were primary level of education, 30% agriculturists were Bachelor Degree and while 20% agriculturists of Master Degree.

Farming experience

Homthong Bananas agriculturists according to farming experience in the study area that 50% agriculturists belonged to the experience group of 11-20 years, followed by 40% agriculturists belonged to the experience group of 1-10 years, while 10% agriculturists belonged to the 21 and above years.

Cost and Return Analysis

Homthong Bananas plantation of the agriculturists had an initial investment such as agricultural equipment, land preparation, sucker, irrigation charge and other expenses for planting of 44,261.65 baht. The particulars initial investment is as follows:

Table 2 The initial investment for planting Homthong Bananas.

Particulars	Price	Percentage
Agricultural equipment	25,946.61	58.62
Sucker	2,693.25	6.08
Irrigation charge	10,560.60	23.87
Other expenses for planting	5,061.19	11.43
Total	**44,261.65**	**100.00**

Table 3 Total Cost (Total Variable Cost and Total Fixed Cost)

Particulars	Amount(Baht per rai per year)	Percentage
Total Variable Cost : TVC (TVC = SK+LC+TM+PI+LB+IC+EME+WBM)	**17,257.20**	**76.17**
1. Sucker (SK)		
2. Land preparation (LP)	386.15	1.70
3. Treatment material cost (TM)	1,763.95	7.79
- Manure		0.00
- Chemical	5,000.74	22.07
4. Pesticides and insecticides (PI)	1,178.46	5.20
5. Labor cost (LC)	0.00	0.00
- Wrapping Homthong Bananas		0.00
- Appling fertilizer	169.23	0.75
- Weeding	892.31	3.94
- Keeping and packaging production	234.82	1.04
6. Irrigation charge (IC)	230.77	1.02
7. Expenses for maintenance of agricultural equipment (EME)	4,420.00	19.51
8. Wrapping Homthong Bananas materials (WBM)	1,026.92	4.53
Total Fixed Cost : TFC(TVC = LT+DVE+LOI)	1,953.85	8.62
1. Land taxM (LT)	**5,399.71**	**23.83**
2. Depreciation value of agricultural equipment(DVE)	10.51	0.05
3. Lost opportunity of investment agricultural equipment (LOI)	4,899.27	21.62
	489.93	2.16
Total Cost : TC	**22,656.91**	**100.00**

After planting Homthong Bananas about 10 months agriculturists had received income from the sale of banana they had the average total cost of 22,656.91 baht per rai per year which consist of fixed cost of 5,399.71 baht and variable costof 17,257.20 baht as shown in table 3.

Table 4 Total Revenue, Total Cost and Net Profit

Items	Amount (Baht per rai per year)
Income from Homthong Bananas	49,085.29
Income from without Homthong Bananas	1,200.00
Total Revenue:TR	**50,285.29**
Total Cost :TC	**22,656.91**
Net Profit: NP	**27,628.38**

Table 4 showed thatthe total income of 50,285.29 baht per rai per year, with a net profit of 27,628.38 baht per rai per year.

Calculated Return on Investment (ROI), Benefit Cost Ratio (BCR) and Net Profit Margin (NPM).

1. Return on Investment (ROI)

$$\text{Return on Investment (ROI)} = \frac{\text{Current Value of Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

$$\text{Return on Investment (ROI)} = \frac{50{,}285.29 - 44{,}261.65}{44{,}261.65}$$

$$\text{Return on Investment (ROI)} = 0.136 = 13.6\%$$

2. Benefit Cost Ratio (BCR)

$$\text{Benefit Cost Ratio (BCR)} = \frac{\text{Total Revenue}}{\text{Total Cost}}$$

$$\text{Benefit Cost Ratio (BCR)} = \frac{50{,}285.29}{22{,}656.91}$$

$$\text{Benefit Cost Ratio (BCR)} = 2.22$$

3. Net Profit Margin (NPM)

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Total Revenue}}$$

$$\text{Net Profit Margin} = \frac{27{,}628.38}{50{,}285.29}$$

$$\text{Net Profit Margin} = 54.94\%$$

The inherent problems and threats from planting banana

Homthong Bananas agriculturists according to problems and threats from planting Homthong Bananas that 100% of the agriculturists had the problem of long drought followed by 60% of the agriculturists suffer the problem of lack of storage facilities and wind problem which leads to felling of the plants before the maturity period was

reported to be suffered by 40% of the agriculturists. And agriculturist's reasons for increase and decrease planting Homthong Bananas which the agriculturists according to their reasons which more and long term income 60% and good yield 20% were also the reason to increase Homthong Bananas planting. The agriculturists who responded to decrease Homthong Bananas acreage perceived the shortage of irrigation water 80% and shortage of capitals 20%.

Discussions

Cost and Return analysis of planting Homthong Bananas of the Agriculturists in Phitsanulok Province which the research found that planting Homthong Bananas of agriculturists had the first investment of 44,261.65 baht per rai per year which agriculturists got revenues after planting Homthong Bananas about 10 months. After agriculturists had received income from the sale of Homthong Bananas, they had the average total cost of22,656.91 baht per rai per year which consist of fixed cost of 5,399.71 baht and variable cost of 17,257.20 baht. Agriculturists had the total revenue of 50,285.29 baht per rai per year, with a net profit of 27,628.38 baht per rai per year. The yields from planting of agriculturists had returned on investment (ROI) of 13.6% which it meant every 100 baht for investment that agriculturists got a return of 13.6 baht, benefit cost ratio (BCR) of 2.22 which it meant every 1 baht of total cost that agriculturists got a return of 2.22 bahtand net profit margin (NPM) of 54.94% which had a positive value indicates that the profit from investment which it meant every 100 baht of total revenue that agriculturists got a profit of 54.94 baht. Therefore, the investment was a worthwhile investment and accepting to planting Homthong Bananas which was consistent with the research with Bondar, Daundkar & Khedkar (2015) studied economics of production of banana in Kolhapur district, Maharashtra state, India for the year 2012-2013. The average total revenue of 40,628.49 baht per rai (564,284.57 Indian Rupee per hectare), the average total cost of 19,647.07 baht per rai (272,876 Indian Rupee per hectare), the average total net profit of 20,981.42 baht per rai (291,408.57 Indian Rupee per hectare) and the average Benefit Cost Ratio (BCR) of 2.07 andChaiyesh (2015) studied cost and return on souvenir products of Ban Nong Takai silk weaving

group, Buriram Province that the findings revealed that of 498 pieces sold out were totally 314,260 baht of revenue from total of 293,127.50 baht of cost. The cost involving souvenir products from silk included of direct material cost, direct labor cost, manufacturing overhead, and selling and administrative expenses, two of forth was direct material cost. Considering the return gained under the two conditions, it found that there was very different because direct labor cost was relatively high. It was 31.02% of total cost. In case of cost including direct labor, the ROI of 5.19%, the NPM of 6.72%, the BEP of sale revenue of 87,215.69 baht and the BEP of sale volume were 91.40 pieces. On the other hand, in case of cost excluding direct labor, the ROI of 35.40%, the NPM of 35.66%, the BEP of sale revenue of 40,018.97 baht and the BEP of sale volume of 41.94 pieces.

The inherent problems and threats on the growing of Homthong Bananas were strong wind which cutting the Homthong Bananastrees followed by lack of water for cultivation, long drought and lack of fertility. Which was consistent with the research withKumar & Nishad (2018) studied on cost and return structure on sample farm in Durg district, Chhattisgarh state, India which the major problems militating against plantain banana production in the study area were the frequent and long period of drought, myriads of marketing challenges, lack of storage facilities, incidence of pests and disease infestation, and the menace of wind storm.

Recommendation

1. The cost of planting Homthong Bananas which agriculturists had relatively high production cost. Variable cost was mostly. Therefore, agriculturists should reduce the amount of some variable factors such as the cost of sucker, fertilizer and should to adjust from using chemical fertilizer to biological substances which able to reduce cost and increase net profits.

2. Irrigation facilities should be made available to farmers to cushion the effect of drought.

3. Agriculturists should plant protective trees round the Homthong Bananas fields as hedge rows to act as wind breaks that will reduce the rate of lodging or felling of Homthong Bananas trees as a result of wind storm.

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