

## Cost-Benefit Analysis of Coconut Oil as Cash Crop: A Case Study of Prachuap Khiri Khun Province

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**Abstract :** This study involves a survey research and analysis of relevant quantitative data. The target population was coconut oil entrepreneurs in Prachuap Khiri Khan Province from which two coconut oil co-operatives in Thapsakae and Muang districts were sampled.

The quantitative research methodology was to analyze cost and benefit for coconut oil creative economy. The study found that the payback period was 3 years and 4 months. The rate of investment was more than 1 or 41%. The rate of return of sales was more than 1 or 22%. The net present value at 20% of rate of return was 561,914 baht. The small and medium coconut oil enterprise in creative economy has a return of net profit within 5 years. The profit index per net investment was 1.2 times of net investment. The interest rate of return to break-even point of present value of net profit was 25.7%. It was more than the rate of loan to invest in coconut oil creative economy at Prachuapkhirikhun Province. This was a high feasibility study of ability and creation for economic added value.

**Keywords :** Coconut Oil, Add value of Economy, Rate of return, Benefit, Cost

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## 1. Introduction

Cultivation of revenue was highest, followed by pineapple, rice, sugarcane and coconut, respectively, in the last year at Prachuapkhirikhun Province. Since 2542 the survey area of 470,924 rais of coconut plantation had yield of 312,427,800 tons per year, worth of 2,221,362 million as figure1. (Bureau of Agricultural Statistic.Statistical of the agriculture official at PrachuapKhirikhun.hhttp://www.prachuapkhirikhan.go.th/data/GRA4.htm. 2553). A focus on the most coconut cultivation in this area did coconut adaption as coconut oil of creative economy. This project is for supporting development and yielding of coconut caused value-added from coconut and re-used the amount of sustainable coconut. The new product in this area was coconut oil for healthy business, massages and spa center and beauty business.

For the economic value of Prachuapkhirikhun Province was promoting coconut planting at currently by requiring the processing of adaption for virgin coconut oil. This product was added economic value creation in the new format to causing revenue from sustainable coconut. The products were in demand of serving business such as business plans and doing massage with aromatic oils. Thus, it was necessary to study and analyze the feasibility of the potential added value of production and the processing product of coconut oil as a crop producer to check and find ways to create added value to be monetary coconut to a group of person related professionals and policy makers of those sustainable in Prachuapkhirikhun Province.

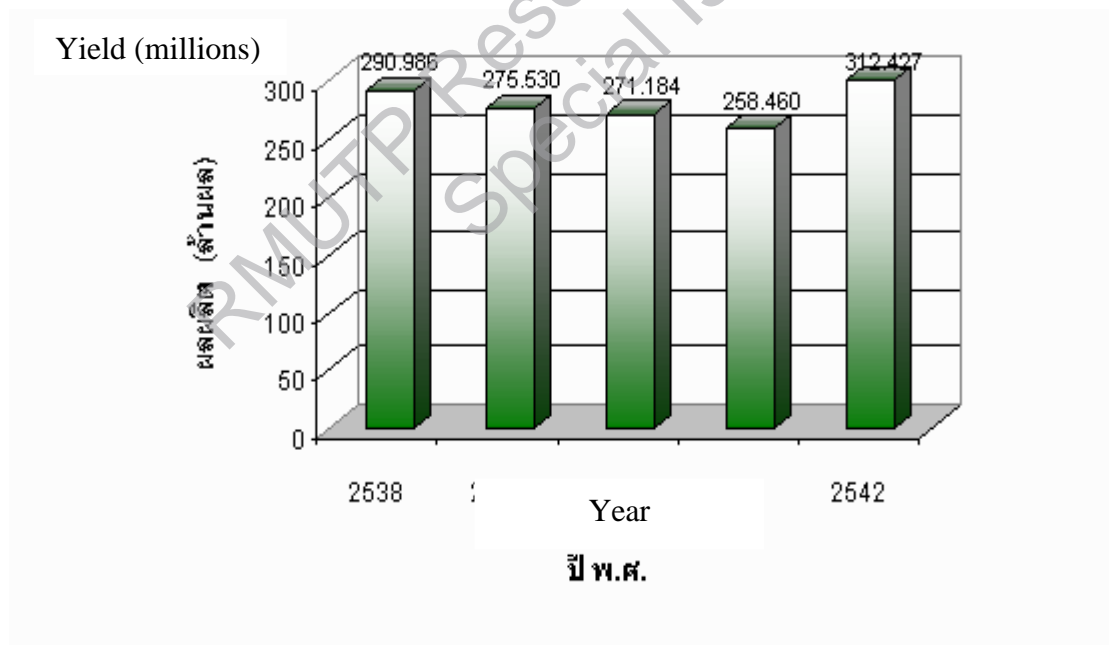


Figure 1 Yield of Coconut in Prachuapkhirikhun Province

## Research Objectives

1.1 To monitor and analyze the production system of coconut products that generate income for the farmers who are doing on these days.

1.2 To evaluate the possibility to choose the way in the creation of economic value added to the people who grow coconuts to result in a variety of options to create income as revenue from adaption coconut occupation.

1.3 To find the potentiality and direction in creating value-added products from coconut to coconut growers groups and agencies that support the promotion of value added, including the ones who get benefit of the business from the coconut industry such as food industry, traditional massage and spa, tourism etc..

## 2. Research Methodology

### 2.1. Population and samples

Population of this research was ones who involves in coconut oil processing in eight districts those were Muang, Thap Sakae, Hua Hin, Kui Buri, Pranburi, Sam Roi Yod, Bang Sapan and Bang SapanNai district. Those two districts had been selected, Muang and Thap Sakae for purposive sampling, which consists of two random samples districts. They must have experienced in coconut oil processing for not less than three years. We found that four samples around province to deeply research were average financial analysis between cost and benefit to become estimation for feasibility study in coconut oil industrial.

### 2.2. Instruments used in this research.

Tools for data collection of this research were a questionnaire with open-ended questions by qualitative interviews which the researcher created from the study of documents and related research. The questionnaire was considered from expert lecturer about cost-benefit in coconut oil business and pre-tested from two coconut oil business besides sampling.

### 2.3. Method to create tools and inspection equipment.

Research papers and research literature related to coconut oil ... Processing plant economy Prachuapkhirikhun Province. A case study of the opportunities and possibilities in the potential and economic value creation had the information about the cost of return and financial analysis to study the feasibility of the business covered by the definition by seeking the advice of experts.

#### 4. Collecting data in this research.

4.1 The secondary data was the study of technical data and related research include various documents and reports of the Office of Agricultural Economics, Agricultural Economics Book of Ministry of Agriculture in 2010, Trade News Book of Provincial Agricultural Office for Prachuapkhirikhun Province in 2009 and statistics Prachuapkhirikhun Province in 2010.

4.2 The primary data was questionnaire and deeply interview from samples. The samplings were professionals in business of coconut oil for 2 Districts. This contains relevant information into three parts such as:

1) Information of the adaption coconut oil community. Find cost and benefit in 2 businesses of coconut oil for 2 districts as experience over 3 years.

2) Information about the cost and benefit of adaption coconut oil products to estimate profit of business and feasibility study in industrial program such as Net present Value of profit with in 5 years : NPV, Interest Rate of Return : IRR, Return on Investment: ROI, Return on sales : ROS, Profit Index : PI and Payback Period.

3) Any other information that affects the adaption of coconut oil.

This research was expected to take time to collect the data from January to June 2012.

#### 5. Analysis of the information.

1. Descriptive analysis was analyzed by gathering information from farmers to get basic information about the general process of production, maintenance, problems and obstacles in the process of community enterprise that coconut oil is the main occupation such as the farmers in Thap Sakae and Maung district at Prachuapkhirikhun Province by the collected data reports.

2. Quantitative analysis was analyzed by the primary data collected from questionnaires and interviewing farmers about processed coconut oil. The data processing estimate cost comparison analysis, yield returns of Investment products as coconut oil. Using financial analysis of investment project to determine whether the investment is appropriate or not depend on coconut oil investment. Decision criteria for evaluating investment projects have four reasons comprise of: (Van Horne, James C. and Wachowicz, John M. Fundamental of Financial Management. 10th Ed. New Jersey: Prentice-Hall, Inc. 1998. Page 271-277)

2.1 To find the payback period duration of the cash flows that will be received in the future equal to the initial investment of the project. There could be calculated from the formula:

The net cash flow in each year was equal in value every year. There can be calculated by

$$\text{Payback period (PB)} = \frac{\text{the amount initially invested}}{\text{Net cash flows expected to be received annually.}}$$

Net cash flows expected to be received annually.

The net cash flow each year of value has not equaled. The payback period was determined by the net cash flow in each year. The accumulated net cash flows equal to the initial investment in the project.

2.2 NPV (Net Present Value: NPV) of the project's initial investment cash flow compare with the present value of the accumulated net cash flows. This referred to as DCF method (Discounted cash flow method) could be calculated by

$$\begin{aligned}\text{NPV} &= \text{Present value of returns} - \text{the present value of the costs.} \\ \text{NPV} &= \text{PVB} - \text{PVC.}\end{aligned}$$

The decision making accepted the project investment when net present value was greater than or equal to 0.

2.3 Return on Investment: ROI decide which projects were the most effective. There calculated by the following formula:

$$\text{Return on investment (ROI)} = \frac{\text{Net profit from operations.}}{\text{Assets to invest}}$$

return on investment (ROI) used to compare the performance of the company. If the rate of return on investment (ROI) was high, the assets had caused more than income.

$$\text{2.4 Profit Index (PI)} = \frac{\text{Net present value}}{\text{Cost of Investment}}$$

$$\text{2.5 Return on sales (ROS)} = \frac{\text{Average Profit} \times 100}{\text{total revenue for sales}}$$

(Somnuk Aeojilapongphan and Dongmany Komalatut. 2552. Accounting Cost 2. Bangkok: McGrew - Hill International. Enterprise House, Inc.)

2.6 Interest rate of return (IRR) was rate of returns on the business projects with the possibility of the operation has to be compared with the rate of returns on the present value is negative when the net profit at the present value was lower than the cost of investment at the net present value and the rate of returns on the present value was positive when the net profit at the present value was higher than the cost of investment at the net present value. At the present value equal zero that it means no profit when the net profit at the present value equal to the cost of investment at the net present value. This calculates as: (Supada Sririkut. 2548., Accounting to management. Bangkok: Tammasan Company limited)

$$\text{IRR} = r \text{ when } \text{NPV} = 0 = \frac{CF_0}{(1+r)^0} + \frac{CF_1}{(1+r)^1} + \dots + \frac{CF_N}{(1+r)^N} \text{ when CF = net cash flow, N = year of Project}$$

### 3. Result of Research

1. Results could be summarized overview of community enterprises that Community enterprise group house produce virgin coconut oil at Prachuapkhirikhun Province. Community enterprise group invested in 2008 with the aim to increase production capacity to meet the needs of organic coconut market, protect natural resources and the environment. The Group had operations processed into coconut oil, organic coconut and cosmetics with a mixture of coconut oil and organic groups Muang and Thap Sakae district. The establishment of a community enterprise is in these districts at Prachuapkhirikhun Province. By combining a professional group of women who

were coconut farmers adapt creation coconut oil. This group realized that the processed coconut oil products were in demand in other places in Prachuapkhirikhun Province and Hotels in beauty sights like coconut oil products. They were suitable for sold to the consumer as well as the Thai and foreigner tourists.

The study cost found that the interview with the two parties. Looks the same, so the average number of items as the cost of starting the business and investment operations at the start with an investment of 3,088,119 baht, the cost results from the production of the product packaging and coconut oil products. By the coconut-cost product are listing below as table1.

**Table 1 Budget of Investment per Year**

Number	List	Units	Price per unit	Total Price(bath)
1	Circulate Capital			1,642,259
2	Land	45	7,800	351,000
3	Factory	1	150,000	150,000
4	Machine			
	- Scrape Machine	1	13,000	13,000
	- Squeeze Machine	2	62,000	124,000
	- Movement Machine	1	161,500	161,500
	- String Machine	1	40,000	40,000
	- Refrigerator	2	60,000	120,000
5	Equipment			
	- Mobile Phone	1	5,000	5,000
	- Etc.	4	340	1,360
6	Vehicle	1	480,000	480,000
<b>Total Investment</b>				<b>3,088,119</b>

Reference: Estimation from interview

From table 1 compare table 2 as estimative for per unit of cost 3 product as following Pure coconut oil per litre, coconut oil in 3 package (30ml, 60ml and 100ml) and 3 packaging (30ml, 60ml and 100ml):

pure coconut oil of cost per unit  $135,863/995 = 142.265$  THB from price 190THB

Cost per unit of coconut oil in package of 30 ml was  $5,002 / 90 = 55.58$  THB from price 95THB

Cost per unit of coconut oil in package 60 ml was  $3,440 / 54 = 63.70$  THB from price 190THB

Cost per unit of coconut oil in package 100 ml was  $4,068 / 56 = 72.64$  THB from price 250THB

Cost per unit of Package 30ml from coconut packaging was  $1,839 / 220 = 8.35$  THB from price 18THB.

Cost per unit of Package 60 ml from coconut packaging was  $10,670 / 660 = 10.23$  THB from price 32THB

Cost per unit of Package 100 ml from coconut packaging was  $16,100 / 1,320 = 12.197$  THB from price 46THB

The sales and production within one year equals 3,600,720 THB. This conclusion is the income of the enterprise community. This is assumptions that produce and sell the items produced by the following at table2.

**Table 2 Revenue per Year of Coconut oil and Coconut Packaging**

Coconut oil in Coconut Packaging	30ml = 1,080	unit	@	95	THB	102,600	THB
	60ml = 648	unit	@	190	THB	123,120	THB
	100ml = 672	unit	@	250	THB	168,000	THB
Package	30ml = 2,640	unit	@	18	THB	47,520	THB
	60ml = 7,920	unit	@	32	THB	253,440	THB
	100ml = 15,840	unit	@	46	THB	728,640	THB
Coconut oil	11,460	Litre	@	190	THB	2,177,400	THB
<b>Total</b>						<b>3,600,720</b>	THB

Reference: Estimation from interview

Community enterprise groups produced pure coconut oil, pure coconut oil and a 5-year between 2007 and 2011 budget of 3,088,119 Baht to invest in a business that has detailed below.

1) Community enterprise group producing pure coconut oil is the payback period (PB) in the business for a period of three years and four months. For estimation is following:

Initial Budget = 3,088,119

Net Profit estimate

Year 1	=	-135,869	}	783,402
Year 2	=	966,949		
Year 3	=	1,473,637		
Year 4	=	2,140,718		
Year 5	=	3,013,353		

Profit at year 4 will have 2,140,718 = 12 Months

Remain Profit is 783,402 =  $\frac{12 \times 783,402}{2,140,718}$

= 4.4 = Payback Period at 3 years and 4 months

2) Community enterprise group producing pure coconut oil to get a return on investment (ROI) is equal to 41.38%. For estimation is following at table3:

Table 3 Net Profit remain constant depreciation: Case study small and medium entrepreneur

Year	Net Profit	Depreciation per year	Remain
1	-135,869	214,022	-349,891
2	966,949	214,022	752,927
3	1,473,637	214,022	1,259,615
4	2,140,718	214,022	1,926,696
5	3,013,353	214,022	2,799,331
<b>Total</b>			6,388,678
<b>ROI</b>	<b>1,277,736</b>		

$$= \frac{1,277,736 \times 100}{3,088,119}$$

$$= 41.38\%$$

3) Community enterprise group producing pure coconut oil to get a return on sales (ROS) is 21.62%.

$$= \frac{1,277,736 \times 100}{5,910,244}$$

$$= 21.62\%$$

4) Community enterprise group received coconut oil yield net present value (NPV) is 561,914 > 0 investments at table4.

Table 4 Net Present value at Return to become additional net present value of profit

Year	Net Profit	PVIF 20%	NPV
1	-135,869	0.833	-113,179
2	966,949	0.694	671,063
3	1,473,637	0.579	853,236
4	2,140,718	0.480	1,027,545
5	3,013,353	0.420	1,211,368
<b>Total</b>			<b>3,650,033</b>

$$= 3,650,033 - 3,088,119$$

$$= 561,914$$

5) Community enterprise group producing pure coconut oil had a choice of investment because the index was equal to 1.2 times the net profit of the investment.

$$= \frac{\text{Net profit}}{\text{Initial Budget}}$$

$$= \frac{3,650,033}{3,088,119}$$

$$= 1.2$$



6) Community enterprise group producing pure coconut oil in the return on investment will be the 25.70% NPV = 0. This calculation is finding NPV = 0 at the IRR between 20 and 28 at table 5.

**Table 5 Show Net Present Value of Net Profit is zero to find Interest Rate of Return**

Net Profit	PVIF 20%	NPV	PVIF 28%	NPV
1) -135,869	0.833	-113,106	0.7815	-106,114
2) 966,949	0.694	671,063	0.6104	590,226
3) 1,473,637	0.579	853,236	0.4768	702,630
4) 2,140,718	0.480	1,027,545	0.3725	797,417
5) 3,013,353	0.402	1,211,368	0.2910	876,886
<b>Total</b>		<b>3,650,105</b>		<b>2,861,045</b>

This calculation is finding IRR that is NPV=0 by processing as:

$$\begin{aligned}
 &= 3,650,105 - 3,088,119 = 561,986 \\
 &= 2,861,045 - 3,088,119 = -227,074 \\
 &= 3,650,105 - 2,861,045 \\
 &= 789,060
 \end{aligned}$$

**Method 1**

$$\begin{aligned}
 &\text{Differential of NPV for PVIF is } 789,060 = 8\% \\
 &\text{Differential of NPV for PVIF at 20\% is } 561,914 = \frac{8 \times 561,986}{789,060} \\
 &= 5.70 \\
 &\text{From PVIF 20\% to NPV at IRR} = 20 + 5.70 \\
 &= 25.70\%
 \end{aligned}$$

**Method 2**

$$\begin{aligned}
 &\text{Differential of NPV for PVIF is } 789,060 = 8\% \\
 &\text{Differential of NPV for PVIF at 28\% is } -227,074 = \frac{8 \times -227,074}{789,060} \\
 &= -2.30 \\
 &\text{From PVIF 28\% to NPV at IRR} = 28 - (2.04) \\
 &= 25.70\%
 \end{aligned}$$

#### 4. Discussion

The analysis of the costs and benefits of coconut oil business enterprise community discussed that the communities in Prachuakhirikhun Province to operate through long payback within five years is 3 years and 4 months, the rate of return on investment is 41 percent, return on sales of 22, percent present value at yields 20 percent affect to be net present value of 561,914 baths within five years to evaluate the small and medium business enterprise. This is profit index is at 1.2 times profit of the investment. And the Interest rate of return on the business communities of the par yield is 25.7 percent greater than the interest rate to be invested. The turnover of the communities in Prachuapkhiri Province is possible in the operations building. This is building

careers in the creative community to strengthen its value-added processing of coconut oil to create sustainable economies for communities.

### **Problems in the operation of coconut oil enterprise in Prachuapkhirikhun Province.**

From interviews with the coconut oil enterprise tell the problems and obstacles in the operation.

**1. Material coconut.** The amount depends on the season of planting coconut. Coconut oil production depends on the amount of coconut production.

**2. Coconut Price.** Coconut price uncertainties affect the cost of production had fluctuated. When the high coconut price affect to coconut quantities to be sold in other forms, such as renewable fuel or a coconut processing plant food. That was produced in quantities of coconut oil in cosmetics are a little, the cost was high to effect may be less profitable.

**3. Delay for production processing.** The production of coconut oil takes the oil to stay in the sedimentation not to speed up production. There were not enough to demand market. As communities try to maintain the quality of products, coconut oil is not rancid when kept long time. And maintain oil quality in line with the quality of healthcare. The production process is time consuming. There might affect the amount of production to market delays.

**4. Unsuitable for making market.** Market is not right for the current market due to competition. Private contractors had to buy coconut oil and the packaging itself. Brands name from urban coconut oil communities had competition with the private company which is big company, high investment and high advantage competition market. Their products good quality coconut oil of community enterprises but the communities is unknown market sharing. In spite of the recognized manufacturers of quality products had been recognized. The public sector information could not compete with the private sector to purchase a particular brand of coconut oil and to create a brand name in small and medium business. The Community Enterprise should be adapted either by selling Wholesale in coconut oil, product form, packaging and promotion marketing. But this is not sell production that is own brand name in business as much.

**5. Certified quality food and medicine.** There were disruptions to communities when do not get certificate of quality food and medicine from Government or other sector. Competitive disadvantage in spite of the quality of manufactured products, coconut oil were private purchase to get the Food and Drug Administration Certificate instead. It was difficult to create a brand name in small and medium business.

### **Suggestion**

1. Recommendations for education research in coconut oil...adaption cash crop of creative economy: A case of the feasibility study of ability and creation for economic added value. Therefore results in a deeper level to identify the strategies at the community level. Subsequent research should consider a larger case study. The competition for the development of high quality products, coconut oil compared to another province. There consider the size of the smaller

communities that could not operate become to analyze the possibility of a smaller business to develop small industries to grow even more.

2. Recommendations on the strategic approach to competition with coconut oil processing business recently. There was seeking ways to reduce costs while this business is still maintaining the quality of oil products for the business enterprise community. The pursuit of strategies is various fields whether it is marketing the product as the product management. Guidelines were the various strategies. The researcher is trying to find answers to guide to help entrepreneurs lead the way to the operative business for coconut oil in the competitive situation with other provinces. There prevent took market share in Prachuapkhirikhun Province from getting orders in Bangkok, destination spa resort in Hua Hin. It is expected that this research will be a guideline for the new strategy. This support the local coconut oil could be competitive with coconut oil from other areas at the present and the future.

In addition, interviews with community business leaders will be in terms of the cost of the feasibility of business projects in the form of processed coconut oil in Prachuapkhirikhun Province. There might be considered a little on the part of management. It did not cover the question of community leaders to answer the question in terms of the market much. The researchers hope that the guidelines will be able to further research to be able to have more comprehensive information on the marketing of coconut oil.



## 5. References

Bureau of Agricultural Statistics. <http://www.prachuapkhrikhan.go.th/data/GRA4.htm>. 2553.

Knowledge institutions in the capital market. Set Index of Thailand. 2553. **Business finance**.

Edition 1. Bangkok: Amarin Printing & Publishing Co. Ltd. (Thailand).

Supada Sririkut. 2548., **Accounting to management**. Bangkok: Tammasan Company limited.

Somnuk Aeojilapongphan and Dongmany Komalatut. 2552. **Accounting Cost 2**.

Bangkok: McGraw - Hill International. Enterprise House, Inc..

Van Horne, James C. and Wachowicz, John M. **Fundamental of Financial Management**. 10<sup>th</sup> Ed.

New Jersey: Prentice-Hall, Inc. 1998.

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