

LOCAL ECONOMIC DEVELOPMENT-BASED ON FARMING MANUFACTURE OF COCONUT SUGAR IN WEST SEI KEPAYANG DISTRICT

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Abstract

The existence of coconut commodity abundance in the district of West Sei Kepayang of Asahan regency of North Sumatra province has not been utilized to the fullest. Though the potential of this commodity can be the basis of local economic development (LED). Of some its derivative products, coconut sugar has the economic potential to improve farmers welfare due to various advantages as well as a good market share prospect. This study aims to analyze the potential for the farm manufacture of coconut sugar to be used as a base of LED in the district of West Sei Kepayang. Data collected by survey method and then analyzed by descriptive quantitative by a financial feasibility analysis those are the Net Present Value (NPV), Net Benefit Cost Ratio (NBCR), Internal Rate of Return (IRR) and Payback of Period (PP) and by descriptive qualitative. The results of a financial feasibility analysis showed that the NPV is positive, NBCR is greater than one, the IRR is greater than the actual interest rate and PP can be restored in a relatively short time.

Keywords: Local Economic Development, Coconut Sugar, Financial Feasibility Analysis.

1. INTRODUCTION

Sugar is the very important basic needs of human life. The consumption of cane sugar in the province of North Sumatra is estimated to increase by 3 percent each year (Purba, et all, 2014). In 2014, the average total consumption of sugar cane in North Sumatera province reached 148,653 tons, only 27.30 percent domestic production can be fulfilled (Statistics of Indonesian Plantation, 2015). The impact, sugar prices tend to be volatile and sensitive, to the detriment of consumers (Purba, et all, 2014).

Meanwhile, coconut sugar can be used as substitutes of cane sugar. That is, demand and supply gap of cane sugar products in North Sumatra province likely to be filled with coconut sugar products. Coconut sugar have the advantage of health aspects because it has 35 percent of a low glycemic index (Monahar, et all, 2007).

The existence of coconut commodity abundance in the district of West Sei Kepayang of Asahan regency of North Sumatra province has not been utilized to the fullest. Though these commodity can produce a variety of derivative

products of economic value for farmers and thus potentially become the basis of local economic development (LED) (Mahmud and Ferry, 2005; Damanik, 2007; Bank Indonesia, 2009 and Kuswanto, 2011).

The development of farm-based on the derivative products of coconut commodity is determined from the intensity of farm value (Kuswanto, 2011). The success of based on the derivative products of coconut commodity farm will have a direct impact on improving farmers and communities welfare (Manurung, 2004; Damanik, 2007).

The potential of farm manufacture of coconut sugar as a driver of LED will be known through the financial feasibility, so the study on "Local Economic Development Based on Farm Manufacture of Coconut Sugar in West Sei Kepayang District" is important to do. The research question is "Is that farm manufacture of coconut sugar feasible as the base of local economic development in the district of West Sei Kepayang?"

2. LITERATURE REVIEW

2.1. Demand and Supply Theories

The demand quantity of an item of good depends on the price, income and preferences (Nicholson, 2002). In the economy, this relationship is applicable to most types of goods (Mankiw, 2006). The price of certain goods and others related substitution goods could be affect the demand of goods (Manurung and Rahardja, 2006). The substitution effect is always negative and opposite to the price (Semaoen, 2011). This means that the presence of other goods as a substitute would depress prices. Falling prices will increase demand and again push prices up on new equilibrium, so producers have an opportunity to increase production (Nicholson, 2002).

2.2. Local Economic Development (LED)

LED is an effort to rid the society of all limitations to become independent. These goals achievement obtained by the encouragement of economic growth and poverty reduction through the diversification of the local economic base by utilizing local resources and skills (Nel and Binns, 2001). The core concept of local economic development (LED) in Blakely and Bradshaw, (2002) view is how to increase economic activity that can open new employment opportunities.

2.3. Coconut Farmers Empowerment

Friedman's (1992) view positions humans as the main actors of empowerment. In the local context, forms of empowerment activities are participatory, adapted to diversity, local peculiarities, and independence through changes in social structures that can be done through skills, knowledge and power affecting the lives of individuals within an institution (Swift and Levin 1987; Parson et al., 1994).

Specifically to coconut farmers, Tarigans (2003) said that their empowerment can be done by improving the cultivation and processing techniques through increasing technology mastery, information and access to sources of financing and marketing of products individually and collectively.

3. RESEARCH METHODS

This research was conducted in the district of West Sei Kepayang which is a centre of regional production of coconut plants in Asahan regency. The research used descriptive survey method. Sulianto et al (2013) used the same method to describe matters relating to the availability of coconut sugar, so it can show that coconut sugar deserves to be developed as a local economic activity. This research data is primary and secondary data obtained through interviews, observation and documentation. Samples were coconut farmers with coconut sugar craftsman status.

3.1. Data Analysis Method

Data was analyzed by descriptive quantitative and qualitative. Quantitative descriptive analysis carried out by a financial feasibility analysis were carried out using a span of 20 years. Some of the key assumptions used in the calculation are as follows:

- The price of nira is Rp. 200/ liter.
- The price of coconut sugar is Rp. 17,000/ kg.
- Own capital and or bank credit
- prices are fixed for the duration of the operation
- The business operation is 20 years.

Calculating the financial feasibility carried out by some methods namely:

1. Net Present Value (NPV)

NPV is obtained by discounting all costs and revenues on a specific discount rate (Darusman, 1981). If $NPV > 0$, then the farm manufacture should be develop. Conversely, if the $NPV < 0$, then its not feasible to be develop.

NPV calculation formula is as follows (Gittinger, 1982):

$$NPV = \sum_{t=0}^n \frac{Bt - Ct}{(1+r)^t} \quad (1)$$

Where :

- Bt = Revenue in year t
Ct = Costs in year t
t = Age project (years)
r = Discount rate (%)
n = Number of years

2. Internal Rate of Return (IRR)

Internal Rate of Return (IRR) is a measure of the success of a project based on the net benefit ($NPV' > NPV''$) were obtained. If the IRR is greater than interest rate, the investment is feasible to develop. Conversely, if the value of

IRR is less than interest rate applicable, the investment is not feasible to develop.

IRR calculation formula is as follows (Kadariah, 1979):

$$IRR = r' + \frac{NPV'}{NPV' - NPV''}(r'' - r') \quad (2)$$

Where :

r' = Interest rate of positive NPV

r'' = Interest rate of negative NPV

NPV' = NPV is positive

NPV'' = NPV is negative

3. Net Benefit Cost Ratio (Net B/C)

Net Benefit Cost Ratio is the value of benefits that received as a direct influence to the society. If the value of Net B/C > 1, then the investment activity is profitable and feasible to be done because the profit is greater than the total cost incurred. But, if the Net B/C < 1, the investment is not feasible to developed.

The formula for computing Net B/C is as follows (Gittinger, 1982):

$$Net \frac{B}{C} = \sum_{t=0}^n \frac{B_t - C_t}{(1+r)^t} / \sum_{t=0}^n \frac{C_t - B_t}{(1+r)^t} \quad (3)$$

Where :

B_t = Revenue in year t

C_t = Costs in year t

t = Age project (years)

r = Discount rate (%)

n = Number of years

4. Payback of Period (PP)

Investment feasibility analysis is specified from the ability of businesses in return of invested capital using the unit year. Usually, the payback period of the project is selected based on the shortest period. Mathematically, the formula used (Gittinger, 1982) is:

$$PP = \frac{\text{Investment value}}{\text{Net cash}} \times 1 \text{ year} \quad (4)$$

4. RESULTS AND DISCUSSION

Farmmanufacture of coconut sugar is a type of home business. A unit of bussines can be said to be financially fesible if the income are able to cover all costs incurred.

4.1. Financial Feasibility Analysis

One of coconut tree is able to produce 1.2 liters of coconut nira (Rumokoi, 1993). While one kilogram of coconut sugar takes 5.56 liters of coconut nira (Jatmika, et, al 1990). These assumptions are used as one of the basic assumptions of the feasibility of coconut sugar production farming in addition to several other

assumptions. The capital comes from bank loans using the assumption of credit interest rate of food and energy security that is equal to 7 percent, with term of credit for five year (Bank Indonesia, 2015). The assumptions of investment and working capital is based on currently obtained prevailing market price through direct surveys and field observations.

Table 1. Basic Assumptions of Feasibility Calculation on Farm Manufacture of Coconut Sugar

No	Assumptions	Unit	Number / Value
1.	Project Period	Year	20
2.	Land + building	m ²	400
3.	Production days per month	Day	25
4.	Month of production per year	Month	12
5.	Production days per year	Day	300
6.	Labor	Person	4
7.	Prices		
	a. Coconut Nira	Rp/kg	200
	b. Coconut Sugar	Rp/kg	17.000
8.	Input Capacity per day	Kg/day	600
9.	The yield output per day		
	a. Coconut Nira	%	14,6
	b. Coconut Sugar	kg	108
10.	Discount Rate	%	7

Sources: Primary data is processed (2015)

Optimal input capacity of the plant is assumed to 1000 liters per day, with a yield of 14.6 percent (Rumokoi, 1993).

Meanwhile, the capital including fixed and operational costs. Fixed capital include land, buildings, infrastructure and installations, office inventory and equipment (details in the appendix). Summary of capital is presented in table 2.

Table 2 Fixed Capital of Farm Manufacture of Coconut Sugar

No.	Elucidation	Cost (Rp)
1.	Land	40.000.000
2.	Building	60.000.000
3.	Infrastructure and Installation	500.000
4.	Office inventory	400.000
5.	Equipment	4.400.000
Total Cost of Capital		105.300.000

Source: Processed Data (2015)

Fixed capital as the cost of land is 400 m² multiplied by the market price of Rp. 100

thousand/m². Building consisting of 10 m x 20 m multiplied by the market price of Rp. 300 thousand/m².

Meanwhile, working capital of farm manufacture of coconut sugar consists of fixed costs, variable costs and additional costs. Fixed costs consist of salaries and depreciation. The variable cost consists of the purchase of raw materials production. For an additional fee consists of office stationery. Recapitulation of working capital of farm manufacture of coconut sugar is presented in Table 3.

Table 3 Summary of Working Capital of Farm Manufacture of Coconut Sugar

No.	Elucidation	The amount of costs (Million Rp)
1.	Fixed cost	74,790
2.	variable Cost	106,950
3.	Additional cost	1,2
Total cost		182,940

Source: Processed Data (2015)

The financing of farm manufacture of coconut sugar consists of fixed and working capital during the initial 3 months of business. Fixed capital entirely sourced from bank loans, while the working capital derived from equity and bank financing. The working capital as much as 65 percent from bank loans and the remaining 35 percent comes from the self-financing. Meanwhile, the depreciation of investments was calculated by straightline method. Recapitulation of venture capital requirements presented in Table 4.

Table 4. Summary of Venture Capital of Farm Manufacture of Coconut Sugar

Description	Owner's equity (Million Rp)	Loan (Million Rp)	Funding Needs (Million Rp)
Investation	-	105,300	105,300
Working capital	5,336	9,909	15,245
Amount	5.336	115,209	120,545
Percentage	35 %	65 %	100 %

Source: Processed Data (2015)

After all basic assumptions structured and the capital designed based on direct price survey, the next step is to analyze the financial feasibility

of farm manufacture of coconut sugar then presented summarized in Table 5.

Table 5. Summary of Financial Feasibility Analysis Results of Farm Manufacture of Coconut Sugar Over 20 Years

Types of products	Cost (Million Rp)	Result (Million Rp)	Gross revenue (Million Rp)	Net income (Million Rp)
Coconut sugar	190,300	550,800	360,500	298,360

Source: Processed Data (2015)

The recapitulation of financial analysis has shown that total net revenue was greater than total expenditure so profitable to develop.

On respond to market changes probability that occurred during farm manufacture of coconut sugar operations, performed several simulations of increase raw material prices of coconut niraas well as decrease in selling prices of coconut sugar. Sensitivity analysis of offarm manufacture of coconut sugar, assuming other variables remain visible in Table 6.

Table 6. Financial Feasibility Analysis Results and Sensitivity of Price Changes

No	commentary	Price changes		NPV (Million Rp.)	Net B/C	IRR (%)	PP (yrs, mth)
		%	Value (Rp.)				
1.	Basic price	0	17.000	564,028	2,60	12,31	3,2
2.	Sugar price (-)	10	15.300	155,720	2,21	9,25	3,9
3.	Sugar price (-)	15	14.450	-48,434	2,02	5,17	4,2
4.	Roomie price (+)	10	220	107,408	2,19	8,24	3,10
	Sugar price (-)	10	15.300				
5	Roomie price (+)	30	260	-1,839,054	1,24	5,20	6,9
	Sugar price (-)	15	14.450				

Source: Processed Data (2015)

At 7 percent discount factor, the value of NPV is amount of Rp. 564,028 million. This means that farm manufacture of coconut sugar generate profits of NPV value over a period of 20 years shows that the farm is feasible to be develop. The IRR value of 12.31 percent is greater than 7 percent of credit interest rate. Net Benefit Cost (NBC) obtained with a ratio of 2,60. This implies Rp.1 invested will gave benefit amount to Rp. 2,6. Payback of period is 3 years plus 2 months. Investment payback of period is faster than the credit period.

Based on the sensitivity analysis of price changes by assuming other variables remain, the

farm manufacture of coconut sugar is still profitable up to a 10 percent price reduction although it will require a slightly longer PP to 3 years and 9 months. Decline in selling prices of coconut sugar by 10 percent resulting NPV at Rp. 155,720 million or still very profitable over a period of 20 years. Meanwhile, NBC value is still stands at 2.21. IRR value remains greater than real interest rate value of amount at 9,25 percent. That is, the interest rate of IRR generated benefit amount of NPV.

Based on combination scenarios of increase of coconut nira purchase prices by 10 percent with a decrease in selling prices of coconut sugar by 10 percent indicates that farm manufacture of coconut sugar is still profitable. It is known from NPV of amount Rp107,408 million over a period of 20 years. NBC value obtained was 2,19. Meanwhile the value of IRR stands at 8,24 percent, or greater than 7 percent of real interest rate value. For a payback period of 3 years plus 10 months is still faster than bank credit period.

Based on the results of financial analysis is known that farm manufacture of coconut sugar is feasible to be developed although with some market shock scenarios. These results supported the research of Mahmud and Ferry, (2005); Damanik, (2007); Bank Indonesia, (2009) and Kuswanto, (2011). The same study also cited the results of Sari, (2011); Romano, (2011); Lay and Pasang, (2012); Bustami et.al, (2014).

4.2. Qualitative Descriptive Analysis

In line with growing awareness of healthy lifestyle among the citizen, the increasing demand for coconut sugar product gives chance to increase the farmers' income (Manohar et al, 2007). However, based on field observations known that farms manufacture of coconut sugar in the district of West Sei Kepayang are still using simple technologies and have led to low productivity. On the other hand, according to Mankiw, (2006), demand are influenced by offered prices by producers to consumers. In addition, coconut sugar prices also affected by market demand (Manurung and Rahardja, 2006). In the context of coconut sugar products, price was very dependent on season. In rainy season, coconut nira production becomes over whelming so that coconut sugar price to be down. Therefore, to boost farm manufacture productivity of coconut sugar is necessary to empower farmers to apply the right technology to improve coconut sugar quality.

In terms of marketing, coconut sugar products must be through a long chain so that farmers do not have strong bargaining power to determine the selling price (Departemen Pekerjaan Umum, 2004). The limitations of market information made coconut sugar product had not absorbed optimally. To cut long chain of coconut sugar marketing and to facilitate coconut sugar producers in obtaining market information and marketing their products, farmers need to be established economic institutions such as cooperatives, associations (Damanik, 2007).

In the LED development, it's necessary the trained institutions to empower human resources through increasing mastery of technology, information and access to finance as well as marketing the products individually or in groups (Tarigans, 2003). These inseparable from local government, private sector and cooperatives role. This is consistent with the results of research and Corona Rodriguez-Pose (2012), Reese (2006), and Valler (1996) concluded that the participation of every stakeholder and the work ethic were the key to entrepreneurial success in LED. Therefore, empowering farmers to develop farm manufacture of coconut sugar should be supported through the provision of venture capital, development of social economy supported infrastructure, establishment of peasant economy and provide training of technology used.

5. CONCLUSION

The results of financial feasibility analysis showed that farm manufacture of coconut sugar is profitable enough to be developed in the central areas of the coconut by taking into account capital availability, adequate supplies of raw materials and marketing ability of the product. However, to generate maximum benefit level required more comprehensive comparative analysis, the use of better alternative technologies, both technical, financial and socio-economic benefits.

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