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FEASIBILITY OF COCONUT SUGAR BUSINESS IN CILONGOK SUB-DISTRICT, BANYUMAS REGENCY

Vita Nurul Faizah[1], Dwidjono Hadi Darwanto[2] & Lestari Rahayu Waluyati[2]
[1,2]Department of Agricultural Socio-Economics, Faculty of Agriculture, Universitas Gadjah Mada
Corresponding author: dwidjonohd.sosek@ugm.ac.id

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ABSTRACT

This research aims to determine the feasibility of processing coconut sugar in the sub-district of Cilongok and to analyze factors that influence coconut sugar production in the sub-district of Cilongok. The primary method of this research is the descriptive-analytical method. The research location was in the sub-district of Cilongok, Banyumas Recency, which has a relatively high potential for coconut sugar to be developed. The selection of locations used the purposive sampling method because the Cilongok sub-district is one of the coconut sugar-producing centers in Banyumas. As many as 60 respondents were gathered by using the purposive sampling method. The data used in this research are primary and were collected through observation, interviews, and recording. The business's feasibility was analyzed by the R/C ratio, π/C ratio, and Breakeven Point (BEP). Factors that influence production was analyzed by regression analysis. The result showed that the coconut sugar business worth to be developed based on efficiency business analysis, capital productivity analysis, labor productivity analysis, and Breakeven Point (BEP) analysis. Factors that positively affected the coconut sugar production are the number of coconut trees diluted and the workforce, while the negative factor is the fuel used.

Keywords: coconut sugar, factors that influence coconut sugar production, feasibility

INTRODUCTION

Agricultural products generally have a seasonal nature which cannot be produced every time. Due to its seasonal nature, agricultural products' price level is very volatile (Wuryaningrat, 2016). So this is where an industry's role is to process agricultural products in such a way as to make them durable.

Agricultural processing aims to preserve, present products to be more ready for consumption, and improve product quality to be presented in a better form and provide more satisfaction to consumers. Many agricultural products can be increased in value to obtain a higher selling price (Widodo, 2003).

One of the agricultural product processing industries is coconut sugar production or what is known as Javanese sugar. Coconut sugar is a sugar made from coconut juice, a liquid produced from tapping the coconut plants. The province of Central Java, precisely in Banyumas Regency, is one of Indonesia's coconut sugar-producing areas.

Banyumas Regency is a large coconut sugar-producing area in Central Java Province. Most of the coconut sugar products produced in this area are marketed to the local market and the export market according to the quality of the sugar produced (Atmoko, 2014). The following is coconut sugar production in Central Java Province.

Table 1. Coconut Sugar Production in Central Java Province

Regency	Production (Ton/Year)	Percentage (%)
Cilacap	44,995.59	28.03
Banyumas	52,648.92	32.80
Banjarnegara	9,962.65	6.21
Kebumen	25,150.22	15.67
Purworejo	18,650.17	11.62
Wonosobo	1,273.10	0.79
Magelang	2,464.00	1.53
Semarang	5,380.00	3.35
Total	160,524.65	100

Source: BPS, 2016

From Table 1. It can be seen that Banyumas Regency is a sub-district with high coconut sugar production. Banyumas Regency is a large coconut sugar-producing area in Central Java Province. Of the 27 Sub-Districts in Banyumas Regency, 23 of them are coconut sugar producers. Most of the coconut sugar products produced in this region are marketed in local and export markets according to the quality of the sugar produced (Indrawati, 2009). It is one of the factors that cause the Banyumas Regency to become a center for the production and sale of coconut sugar by coconut sugar processing household businesses.

Table 2. Coconut Sugar Production in Banyumas Regency

Sub-District	Production (Ton/Year)	Percentage (%)
Wangon	5,670.28	18.14
Cilongok	10,536.90	33.71
Sumpiuh	5,740.60	18.37
Gumelar	5,663.24	18.12
Pekuncen	3,646.49	11.67

Source: Banyumas Regency Agriculture and Food Security Office, 2017

From Table 2, it is known that based on the results of the mapping of the potential for developing coconut deres in the Banyumas Regency, which has a relatively high production is Cilongok Sub-District. The five sub-districts are geographically overgrown with coconut trees and become centers for making coconut sugar. The coconut sugar home industry's operation from the beginning of manufacture to consumer consumption is essential for the actors because it provides an advantage.

The growth speed of the coconut sugar processing industry in the Banyumas Regency is mostly driven by the brown sugar industry sub-sector, which is spread across several sub-districts such as Pekuncen, Cilongok, Somagede, Ajibanrang, Purwojati, and others. Coconut sugar products in Banyumas Regency have advantages that are difficult to imitate by coconut sugar products from other regions because naturally, the juice's quality is better due to natural factors. The coconut sugar business in Indonesia has promising prospects to be developed. It can be seen from the high demand both domestically and abroad, especially for the type of printed sugar, which is often difficult to fulfill (Atmoko, 2014).

Research purposes

Analyze the feasibility of the coconut sugar processing business in the Cilongok Sub-District.

Analyze the factors that influence coconut sugar production in Cilongok Sub-District.

METHOD

Basic Research Methods

The primary method used in this research is descriptive. The descriptive method describes and summarizes various conditions, situations, or variables. Descriptive research analyzes at the descriptive level, namely analyzing and presenting facts systematically so that it is easier to understand and conclude. Descriptive research systematically and accurately describes a particular field's facts and characteristics (Wirartha, 2006).

Research Location Determination Method

The location used as a research site is in Cilongok Sub-District, Banyumas Regency. The research location was determined by a purposive sampling method, which was determined deliberately by the researcher as the basis for considering that the area is one of the coconut sugar-producing centers in Banyumas. Coconut sugar craftsmen also have a certificate of recognition.

Respondent Sample Determination Method

The determination of the sample of respondents in this study were coconut sugar craftsmen who produce coconut sugar. Samples were taken as many as 60 of 373 artisans in Cilongok Sub-District, carried out deliberately by researchers (purposive sampling) recommended by the Cilongok Sub-District officer (Khikmawati, 2015). Some of the respondents' residential locations have rugged terrain to reach; some respondents are not fluent enough in Indonesian, and not all coconut sugar craftsmen produce every day. Samples were taken spread out in three villages in Cilongok Sub-District.

Data analysis method
Based on the objectives and hypotheses proposed in this study, the analysis used is as follows:

Hypothesis 1
Business feasibility can be measured by the ratio between total revenue and total cost (R/C) ratio, (B/C) ratio, capital productivity (π/C ratio), labor productivity (PTK), and Breakeven Point (BEP).

R/C (Return Cost Ratio), also known as the ratio or ratio between revenues and costs. Mathematically it can be formulated as follows:

$$\frac{R}{C} = \frac{TR}{TC} \text{.....(1)}$$

In which :
R/C = Total Revenue Cost Ratio
TR = Total Revenue
TC = Total Cost

Criteria:
R/C = 1 then the business does not profit and does not lose or break even
R/C< 1 indicates that the business is not feasible to run
R/C> 1 means that the business is feasible to run

Capital Productivity (π/C)
Capital productivity is the ratio between profit and total cost and is used to measure the return for working capital, which can be formulated as follows:

$$\pi \; ratio = \frac{Profit}{Total\ Cost} \times 100\% \text{.....(2)}$$

The criteria for acceptance and rejection of the π/C ratio are as follows:
π/C> Applicable interest costs, the project is feasible to work on
π/C = Applicable interest costs, the project is at breakeven (BEP)
π/C <Applicable interest costs, the project is not feasible to work on

Breakeven Point (BEP)
BEP analysis is often used to determine the breakeven limit of a business. The breakeven point shows the state of the company in a no-profit and no-loss condition. BEP analysis consists of 2 types, namely price BEP and production BEP.

BEP price

$$BEP\ price = \frac{c}{Y} \text{.....(3)}$$

In which:
C = Total costs (explicit costs - implicit costs)
Y = Total production (Suratiyah, 2011)
Hypothesis testing :
Output price > BEP price, coconut sugar processing business is feasible to be developed.
The output price is < BEP price; the coconut sugar processing business is not feasible to develop.

BEP production

$$BEP\ Production = \frac{FC}{P - AVC} \text{.....(4)}$$

In which :
FC = Fix cost
P = Output price (Rp/kg)
AVC = Average variable costs
(Suratiyah, 2011)
Hypothesis testing :
If the business production> BEP production, then the coconut sugar processing business is feasible to be developed.
If the business production is <BEP production, then the coconut sugar processing business is not feasible to be developed.

Hypothesis 2
In the second hypothesis, which is to determine the factors that influence coconut sugar production, multiple linear analysis is used, a regression model consisting of one dependent variable and more than one independent variable. Dependent variables are variables whose changes are influenced by other variables (independent variables) (Gujarati (2007). Multiple linear analysis with the Cobb-Douglas function as follows:

$$\text{Ln GKC} = \beta 0 + \beta 1 \ln X1 + \beta 2 \ln X2 + \beta 3 \ln X3 + ui \text{.....(5)}$$

In which:
GKC = coconut sugar output (production) (kg)
X1 = number of coconut trees (trees)
X2 = labor (Working work for farmers)
X3 = fuel (m^3)
β0 = intersep
βj = estimator parameter coefficient, where i = 1, 2, 3

In order to get a good model, the model with classical assumptions is first tested. The classical assumption test carried out are as follow:
Normality test
Multicoloniarity Test
Heteroscedasticity Test
According to Gujarati (2006), to test the hypothesis using OLS, the adjusted R2, t-test, and F test also need to be considered.

Analysis of Coconut Sugar Processing Business Production Analysis

The coconut sugar processing business in the Cilongok sub-district, Banyumas, is classified as a small business industry. This coconut sugar processing business uses sap as its primary raw material to be processed into coconut sugar. In producing its product in the form of sugar, the amount is determined in two different seasons. In the rainy season, which lasts for nine months, the resulting sugar production is lower than in the dry season, lasting for three months.

RESULTS AND DISCUSSION

Table 3. Average Coconut Sugar Production in Cilongok Sub-District in 2017

Seasons	Tapped coconut trees (Stem)	Sugar Production (Kg)
Rain	19.95	1,640.25
Dry	19.95	651.00
Total	39.90	2,330.00

Source: Primary Data Analyzed in 2017

Table 3 shows the coconut sugar produced in the Cilongok sub-district using the primary raw material, namely coconut juice. From this table, it can be seen that the production of coconut sugar produced varies in each rainy and dry season, although the number of trees that are pressed is the same in the two seasons. In the rainy season, the sap obtained is mixed with rainwater so that the sap produced to produce sugar has decreased quality and is difficult to thicken, resulting in longer cooking time. The difference in production yields in the rainy season is only one kilogram smaller than the dry season with the dry season, which lasts for about four months.

Cost Analysis

In business, the cost is a sacrifice of economic resources to achieve specific goals that are useful at present or in the future (Elpawati, 2015). According to Bergstrom T.C. (2002), production costs are costs that occur in the production function, where the production function is a function that processes raw materials into finished goods. The coconut sugar processing business's production costs incurred from extracting sap to marketing include fixed costs and variable costs, shown in Table 4.

Table 4. Average Total Cost of Coconut Sugar Processing Business in Cilongok Sub-District in 2017

Components	Cost (Rp/Year)	Percentage (%)
Variable Costs	7,273,269.26	80.89
a. Cost of Auxiliary Materials	137,769.26	
b. Fuel Costs	7,135,500.00	
Fixed cost	1,718,089.00	19.11
a. Depreciation Cost	169,281.00	
b. Miscellaneous expense	43,158.00	
c. Tree Rental Fees	1,505,650.00	
Total Cost	8,991,358.26	100.00

Source: Primary Data Analyzed in 2017

Table 4 shows that coconut sugar craftsmen's average total cost at the household scale in Cilongok Sub-District is IDR 8,991,358.26. The most considerable cost incurred in the coconut sugar processing business comes from variable costs, namely Rp 7,273,269.26 or 80.89% of the total cost. The variable cost component incurred is more than the fixed cost, which is only IDR 1,718,089 or 19.11%.

Revenue, Income, and Profit Analysis

Revenue from the coconut sugar processing business in the Cilongok sub-district is the multiplication of the average total coconut sugar produced and the average coconut sugar price per kilogram.

Table 5. Average Acceptance of Coconut Sugar Processing Business in Cilongok Sub-District in 2017

Components	Rainy season	Dry season	Value (Rp/Year)
Total Production (Kg)	1,640.25	651,00	2,291.25
Price/kg (Rp)	9,888.33	9.888,33	9,888.33
Revenue	16,219,333.28	6.437.302,83	22,656,636.11

Source: Primary Data Analyzed in 2017

Table 5 shows that the amount of coconut sugar production produced by craftsmen in the rainy season is more significant than in the dry season, with the average amount of products produced in the rainy season is 1,640.25 kg. However, coconut sugar quality produced during the dry season is better than during the rainy season. Due to the rainy season, the water content in coconut sugar is higher so that the effect on the resistance of the resulting coconut sugar will quickly decline. The average revenue for coconut sugar in the two seasons is IDR 22,656,636.11. Revenue can be obtained from reducing the revenue and the total cost, including fixed costs and variable costs.

Table 6. Average Income of Coconut Sugar Processing Business in Cilongok Sub-District in 2017

Components	Value (Rp/Year)
Revenue (1)	22,656,636.11
Cost	
Variable Costs	7,273,269.26
Fixed cost	1,718,089.00
Total cost (2)	8,991,358.26
Income (1)-(2)	13,665,277.85

Source: Primary Data Analyzed in 2017

Based on Table 6, it can be seen that the average income received by coconut sugar craftsmen in the Cilongok sub-district is IDR 13,665,277.85. The income earned by sugar craftsmen depends on the level of production and the selling price. Meanwhile, the selling price is determined by market conditions. Profits are obtained from reducing income with labor wages in the family and interest on own capital.

Table 7. Average Profits of Coconut Sugar Processing Business in Cilongok Sub-District in 2017

Components	Value (Rp/Year)
Income (1)	13,665,277.85
Labor in the family costs	10,588,875.00
Own Capital Interest Costs	775,706.24
Total (2)	11,361,581.24
Profit (1)-(2)	2,303,696.61

Source: Primary Data Analyzed in 2017

Based on Table 7, it can be seen that the average profit earned by coconut sugar craftsmen in the Cilongok sub-district is IDR 2,303,696.61. This benefit was obtained from a reduction between income and TKDK expenses of Rp. 10,588,875 and the cost of own capital interest of Rp. 775,706.24. The coconut sugar craftsmen's profit is more significant than zero, so the coconut sugar processing business is feasible to be developed.

Table 8. Analysis of R/C Ratio of Coconut Sugar Processing Business in Cilongok Sub-District in 2017

Components	Value
Revenue (Rp)	22,656,636.11
Total Cost (Rp)	8,991,358.26
R/C Ratio	2.52
Standard	(R/C >1)
Feasibility	Feasible

Source: Primary Data Analyzed in 2017

Feasibility of Coconut Sugar Processing Business

R/C Ratio

More than one R/C ratio value generated by the coconut sugar processing business in the Cilongok sub-district means that the coconut sugar processing business has benefited the craftsmen.

Capital Productivity

$$\beta = \frac{\pi}{c} \times 100\% \beta = \frac{\pi}{c} \times 100\%$$

$$\beta = \frac{2,303,696.61}{8,991,358.26} \times 100\%$$

β = 25.62%

From the above calculations, it can be seen that the capital productivity of the banana chips business is 25.62%. It refers to the BRI KUR (People's Business Credit Bank Rakyat Indonesia) of 9% for bank interest. It means that capital productivity is greater than bank interest, so it can be concluded that the banana chips business in the Cilongok sub-district is feasible to develop.

***Breakeven Point* (BEP)**

BEP Price (Rp/Kg)

$$\text{BEP price} = \frac{\text{TC}}{\text{Y}}$$

$$BEP = \frac{\text{FC} + \text{VC}}{\text{Q}}$$

$$BEP = \frac{8,991,358.26}{2,330} BEP = \frac{8,991,358.26}{2,330}$$

BEP= Rp 3,858.95/kg

BEP = Rp 3,858.95/kg

A business can be said to be feasible if the product price is > BEP price. The coconut sugar processing business's product price in the Cilongok sub-district is IDR 9,888.33, so that it is greater than the BEP price, so the coconut sugar processing business is feasible to be developed.

BEP Production (Kg)

$$BEP\ Production\ (kg) = \frac{\text{FC}}{\text{P}-\text{AVC}}$$

$$BEP\ Production\ (kg) = \frac{\text{FC}}{\text{P}-\text{AVC}}$$

$$= \frac{1,718,089}{9,888.33\ (\text{kg}) - 3,121.57\ (\text{kg})}$$

= 253.90 kg

The coconut sugar processing business in the Cilongok sub-district is 2,330.00 kg, so that it is greater than the BEP production value of 253.90 kg, so it can be said that the coconut sugar processing business in the Cilongok sub-district is feasible to be implemented.

Analysis of Factors Affecting Coconut Sugar Production

The analysis of the factors that influence coconut sugar production is done by regressing the independent and dependent variables. However, before regression analysis is carried out, it is necessary to test the classical assumptions first.

Normality Test

The normality test on the regression model is carried out to test whether the dependent variable and the independent variable are normally distributed or not.

Table 9. Normality Test Results using the Histogram Normality Test

Test Parameters	Test Result
Jaque-Bera Value	1.1667
Probability	0.5580

Source: Primary Data Analyzed in 2017

Based on Table 9, the normality test results are obtained with a Jarque-Bera fallow value of 1.1667 and a probability of 0.5580. The probability value is greater than the critical limit of 1%, 5%, and 10%, which means that H0 is accepted. So it can be said that the data to be analyzed has been normally distributed.

Multicollinearity Test

Table 10. Multicollinearity Test Results

Variables	Variance Inflation Factor
Tapped coconut trees	1.6466
Labor	1.6384
Fuel	1.0081

Source: Primary Data Analyzed in 2017

Based on Table 10, it can be seen that the VIF of each of the independent variables (coconut trees, labor, fuel) is smaller than ten, which means that there is no linear relationship between the independent variables, which indicated by the absence of multicollinearity symptoms.

Heteroscedasticity Test

Table 11. Heteroscedasticity Test Results Using the White Heteroskedasticity Test

Number		*Sig.*
1.	F-statistic	1.1746
	Probability	0.3276
2.	Obs*R-squared	3.5520
	Probability	0.3141

Source: Primary Data Analyzed in 2017

Based on Table 11, it can be seen that the probability Obs * R-squared is more than α 0.05, which is 0.31. It means that H0 is accepted, which means that the model has a constant variant or homoscedasticity so that the data obtained does not have heteroscedasticity symptoms. The regression model used is good and can be continued with multiple linear regression analysis.

Factors Affecting Coconut Sugar Production

The next step after carrying out the classical assumption test is to analyze the factors that influence coconut sugar production, shown in Table 12.

Coefficient of Determination

In Table 12, it can be seen that the value of Adjusted R2 is 0.77988 or 77.99%, which means that the variation of the independent variables (coconut trees, labor, classifying material, fuel) can explain the dependent variable (coconut sugar production). In comparison, the remaining 22.01% is explained by other variables outside the model.

Table 12. Results of Analysis of Factors Affecting Coconut Sugar Production

Number	Variables	Expected Sign	Coefficient	t-stat	Prob.t-stat
1.	Constant		20.9113 ns	1.56376	0.1235
2.	(Ln) Tapped coconut trees	+	0.43583***	6.87865	0
3.	(Ln) Labor	+	0.82978***	5.73744	0
4.	(Ln) Fuel	+	-0.08106**	-2.01572	0.0486
	R^2				0.79107
	Adjusted R^2				0.77988
	F-statistic				70.6772
	Prob. (F-stat)				0

Source: Primary Data Analyzed in 2017

In which:
*** = Significance at 99% confidence level (α=0.01)
** = Significance at 95% confidence level (α=0.05)
* = Significance at 90% confidence level (α=0.1)
ns = Non significan

The following is the regression equation obtained from the analysis:
Ln Y1 = 20,9113 +0,43583 LnX1 +0,82978 LnX2 -0,08338 LnX3 -0,08106 LnX4+ μi

F-Test

In Table 12, it can be seen that the probability F value is 0.0000, which means that the value is smaller than 0.05 so that the independent variables (coconut trees, labor, and fuel) together have a significant effect on the dependent variable. (coconut sugar production).

T-Test

Tapped Coconut Trees

Based on Table 12, it is known that the coefficient value of the coconut tree that is pressed is 0.436. It means that every one percent increase of coconut trees that are pressed will increase by 0.436 percent of coconut sugar production. The coconut trees that are pressed can produce sap, which is the raw material for making coconut sugar. The more coconut trees that are being washed down can increase the production of coconut sugar itself. The influencing factors were the coconut tree's age; the older the coconut palm trees produced, the more, and the average age of coconut trees in my respondent was 30 years.

Labor

The coefficient value of labor is 0.830. It means that every one percent increase in the workforce will increase by 0.830 percent coconut sugar production. If the workforce increases, especially for tappers, the coconut sugar production will increase because of the amount of sap used for making coconut sugar increases.

Fuel

The coefficient of the coefficient for fuel is -0.081. It means that every one percent reduction in fuel will increase 0.081 percent of coconut sugar production. It is because not all factors can increase production, but some factors can reduce production. The rainy season that lasts for about nine months, causes the sap to be less profitable because it is mixed with rainwater. It makes cooking coconut juice more time because of the additional rainwater and makes it challenging to thicken. This long cooking time requires much fuel; even though the product produced does not increase, it decreases or causes the coconut sugar production obtained to shrink.

CONCLUSIONS

The coconut sugar processing business in the Cilongok sub-district is feasible for business efficiency analysis, namely the R/C ratio, capital productivity (π/C), and BEP analysis.

Factors that positively affect coconut sugar production in the Cilongok sub-district are the number of coconut trees and labor, while the factors that have a negative effect are fuel.

Suggestion

The government is expected to provide rejuvenation facilities and promote good cultivation methods to increase craftsmen's income.

To reduce the number of smallholders' costs in the coconut sugar production business, reducing firewood use and seeking alternative energy-efficient and cost-effective fuels such as promoting sawn waste.

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