



INCOME AND ADDED VALUE OF BROWN SUGAR BUSINESS IN LEBONG REGENCY, BENGKULU PROVINCE

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ABSTRACT

Lebong Tengah District is a brown sugar production center in Lebong Regency, Bengkulu Province. The production process and marketing channels are factors that determine the price and quality of brown sugar reaching consumers. The purpose of the study is to determine the level of income and added value of sap obtained by brown sugar producers. The research was conducted in the village of Danau Liang, Central Lebong District, Lebong Regency. A survey of 45 brown sugar producers randomly selected was conducted to obtain research data. Based on the results of the study, it can be seen that for every one-time production process (PP) the income obtained by brown sugar producers is Rp320,333.33 with production costs incurred of Rp249,348.78 so the income earned by brown sugar producers is Rp70,984.55. The added value obtained from processing 100.20 liters of sap with the price of raw sap of Rp1,800.00 to become 21 kg of brown sugar is Rp712.00/Kg. In terms of processing sap into brown sugar, it is very important to pay attention to the costs incurred for the production process by further optimizing production costs and maximizing brown sugar production, the producers will get greater profits from this brown sugar processing..

INTRODUCTION

Palm sugar or brown sugar is produced from palm or palm sugar plants that are not specially cultivated by the surrounding community but are allowed to grow in gardens or forests. Palm trees by the community in Lebong Regency are taken for their sap to be used as raw material for making palm sugar / brown sugar. In Lebong Regency, palm sugar is better known as brown sugar. The raw material for brown sugar is obtained by producers by collecting sap water from one tree to another. The process of collecting sap is carried out by producers every day. This is done so that the availability of raw material for sap can be guaranteed every day and the production process for making brown sugar can take place continuously (L.E. Ulaan, et al. 2015).

Generally, brown sugar producers make their production business only as a side job in order to get additional income. The produced brown sugar is accommodated or collected by producers to be marketed or sold to buyers, both collectors, and final consumers. So it can be said that the flow of the agribusiness system carried out by producers in Lebong Regency, namely Lebong Tengah District includes activities for providing production facilities, production processes, and marketing. From the results of the marketing of brown sugar, the producers will get a profit which is known as the household income of the palm sugar producers. In addition, it can also be seen the efficiency of marketing in the Lebong Regency (Simamora, et al. 2019; Aprianti et al, 2020), Sufa & Khoiriyah (2017).

The industry is a system that processes raw materials into a product so that it has added value. The sugar palm industry means a system that processes raw materials from palm trees into one or various value-added products. Raw materials derived from the Aren tree include sap, kolang kaling fruit, palm fiber, sticks, leaves, flour, stem wood, roots, and others. In addition, brown sugar can also provide other added values that can be used as raw materials or mixtures to produce other types of food. In some areas, brown sugar is used as food products that have added value, such as palm sugar, palm sugar, liquid palm sugar, powdered sugar, palm sugar, palm wine, legen, mouse stamp, bioethanol, palm wine, palm fiber, brooms, brushes, fiber ropes, fiber sheets, roofing fibers, fro, broomsticks, skewers of palm sticks, palm flour, sago palm pearls, various palm wood crafts, palm bark shavings, palm root crafts, etc (Luhukai, 2016; Indra et al, 2018).

Many value-added palm derivative products have so far been produced from the sugar palm industrial system as a system that prepares and processes starting from raw materials to increase added value by using technology, infrastructure, input from outside the system, human resources, and management, and capital patterns. capital (social capital, natural capital). This system will run on an ongoing basis to produce a value-added final product (output) as expected (Hasmidar, 2016; Agustianis, 2020; Pudyastuti, 2019)

Central Lebong District is a brown sugar producing center in Lebong Regency, Bengkulu Province. The production process and marketing channels are factors that

determine the price and quality of brown sugar reaching consumers. So aim this research can be seen how much income and added value of sap were obtained by brown sugar producers.

RESEARCH METHODS

Methods Determination of The Research Location and Time

The research was conducted in Danau Liang Village, Lebong Tengah District, Lebong Regency. The research location was determined purposively (deliberately) with the consideration that Central Lebong District is a brown sugar producing center in Lebong Regency. Data collection was carried out in November 2019.

Data Collection Methods The data

Used in this study are primary data and secondary data. Primary data were collected by means of observation and interviews. Interviews were conducted using a questionnaire guide.

Methods of Determining Respondents

The research was conducted using the survey method. The research population is brown sugar producers who also act as sap seekers from the palm trees they have in the research area. The number of brown sugar producers in the Lebong Tengah District is 126 producers. The sampling method used is Simple Random Sampling. As an elementary unit in this study, brown sugar producers in Lebong Regency. While the population is the total number of brown sugar producers in the research location (Central Lebong District). Determination of the number of samples was carried out using the formula proposed by Nazir (2014), Sari et al (2022), Siyoto & Sodik (2015). as follows:

$$n = \frac{N\sigma^2}{(N-1)D + \sigma^2}$$

Note: N = Total population of palm sugar producers in the two selected villages, namely 126 producers; σ^2 = Population variants; and $D^2 = \frac{B^2}{4}$

An acceptable error rate (in this study used 5%) so that the obtained value

$$D^2 = \frac{B^2}{4} = \frac{(0.05)^2}{4} = 0.000625$$

The variance value is obtained from the following two steps, the first step is to determine the number of temporary samples of 20 producers who were randomly selected in two selected villages and record the amount of palm sugar

production per production process. Furthermore, from the 20 examples of palm sugar producers, the variance value of palm sugar production is estimated. The production variance is estimated by the formula:

$$\sigma^2 = \frac{\sum (X_i - \bar{X})^2}{n-1} \quad (\text{Nazir, 2014})$$

From the estimation results obtained a variance value of 0.04211 so that the number of respondents who are palm sugar producers used in this study is 45 palm sugar producers

Analysis Method Data

Revenue and Business Efficiency

According to Soekartawi (1995), Apriani et al (2017), Amir et al (2017) income is the difference between revenue and all costs. Mathematically it can be formulated:

$$I = TR - TC; TR = Q \times P; \text{ and } TC = TFC + TVC$$

Notes: I = Income (Rp/1 times the production process); TR = Total Revenue (Rp/1 times the production process); and TC = Total Costs (Rp/1 times the production process).

Meanwhile, to determine the efficiency of the brown sugar business in Danau Liang Village, Lebong Tengah District, Lebong Regency, the following formula is used:

$$R/C \text{ ratio} = \frac{TR}{TC}$$

With the criteria

- If R/C Ratio > 1 palm sugar business is efficient and profitable
- If R/C Ratio = 1 Inpas palm sugar business
- If the R/C Ratio < 1 palm sugar business is inefficient and detrimental

Value-Added Analysis

To determine the added value of the brown sugar production business in Lebong Regency, the value-added analysis is carried out as follows:

Table 1 Value-added analysis format (Rp/Kg)

No.	Variables (Output, Input, Price)	Notation
1.	Yield/production (kg/process)	a
2.	Raw materials (bunches/process)	b
3.	Labor (person/process)	c
4.	Conversion factor (1/2)	$a/b = m$
5.	Coefficient of labor (3/2)	$c/b = n$
6.	Average product price (Rp/kg)	d
7.	The average wage (Rp/kg)	e
Income and profits		
8.	Price raw materials (Rp/bunch)	f
9.	Contribution of other inputs (Rp/kg)*	g
10.	Product value (Rp/kg) (4x6)	$m \times d = k$
11.	a. Value added (Rp/kg) (10-8-9)	$k - f - g = 1$
	b. Value added ratio (%) (11a/10)	$1/k \% = h \%$
12.	a. Labor benefits (Rp/hk) (5 x 7)	$n \times e = p$
	b. Share of labor (%) (12a/11a)	$p/1 \% = q \%$
13.	a. Profit (Rp) (11a – 12a)**	$1 - p = r$
	b. Profit rate (%) (13a/11a)	$r/1 \% = 0 \%$

Source: Hayami, et all. Agricultural Marketing and Processing In Up Land Java.1989

Information:

* = Auxiliary materials

** = Rewards for capital and management

RESULTS AND DISCUSSION

Revenue and Business Efficiency Brown Sugar

Production Costs

Sugar processing activities start from the preparation of tapping trees to brown sugar are ready to be marketed or sold. Therefore, brown sugar processing is a processing process, of course, tools and equipment are needed for the smooth running of the business (Widyantara, 2019; Asmaida, 2017).

The costs used in this study can be classified into 2 (two) types, namely fixed costs and variable costs during the production period of 1 (one) month. The following will describe the components of these costs.

Fixed Costs

Fixed costs in the brown sugar processing business in Danau Liang Village are only depreciation costs, while they do not pay taxes. This is due to the location of Liang Lake Village which is very far from the center of government and the land used is still and cleared illegally. The village of Lake Liang is located in the highlands which were originally hills experiencing deforestations and turned into coffee plantations and recognized as ownership rights.

The amount of depreciation expense for tools in the brown sugar processing business during one production process is Rp. 75,728.6,-. For more details regarding the depreciation cost of equipment, seen Table 2.

Table 2 Cost of Depreciation of Brown Sugar Processing Business Equipment in Danau Liang Village

No	Type of Equipment	Cost (Rp)	Percentage (%)
1	Kuali	321	19.07
2	Bumbung	300.12	17.83
3	Baronang	343.37	20.40
4	Stapler	169.23	10.05
5	Knives	141.93	8.43
6	Spoon	57.76	3.43
7	Hatchet	40.05	2.4
8	Iron Filter	48.51	2.9
9	Mold	49.63	2.94
10	Ladle	211.26	12.55
Total		1682.86	100

Source: Primary Data After Processing (2020)

Table 2 shows the largest percentage of tool depreciation in the brown sugar processing business is the type of tool or basket in the research area called bronang. Bronang is a place to put brown sugar made from rattan roots with a percentage of 20.40% and the lowest in the cost of ax tools, which is 2.4% of the total cost of tools or tool depreciation.

Variable Costs

In the brown sugar processing business in Danau Liang Village, the variable costs include the production facilities consisting of the costs of raw materials, auxiliary materials, and labor costs. From the description of the costs above, the average variable cost in the brown sugar processing business for one production process in Danau Liang Village is Rp247,665.92. For more details on this variable cost, seen Table 3.

Table 3 Average Variable Costs In Brown Sugar Processing Business in Danau Liang Village

No.	Description	Of Cost (Rp)	Percentage (%)
1	Raw materials	180,360.00	72.82
2	Fuel	410.22	0.16
3	materials	62,843.62	25.40
4	Labor	4,052.08	1.63
Total		247,665.92	100

Source: Primary Data After Processing (2020)

Table 3 shows the largest percentage of the variable cost component in the brown sugar processing business is the cost of raw materials, which is 72.82% and the smallest is the cost of auxiliary materials, which is 0.16%.

Cost of Raw Materials

Raw materials are the main ingredients of the brown sugar business because, without these raw materials, brown sugar cannot be produced. The raw material is sap water obtained by producers from tapping on palm trees. The cost of the main raw materials in the brown sugar processing business is an average of 100.2 liters/production or Rp180,360,-/production.

Auxiliary Materials

In the manufacture of brown sugar, apart from the cost of the main raw materials, auxiliary raw materials are also needed, such as sweet oil. Sweet oil is used to avoid the overflow of sap during sugar cooking, the average auxiliary material used in 1 (one) production period is 410.22 grams per production or 0.16% per production. Of the total variable costs, auxiliary costs are the costs with the least use of the total variable costs used in the brown sugar processing business. This is because the use of auxiliary materials in the process of making brown sugar is very little.

Fuel

In the process of cooking sap water into brown sugar, firewood is used to get a flame. Firewood is obtained by producers by looking into the forest which is not too far from the producers's residence and is very easy to obtain. In this study, the value of fuel is converted to the value of sales of firewood in the research area. The price of firewood in the research area is Rp250.000/m³. The average need for firewood is 0.25m³/month or with an average cost of Rp62,843.62/production.

Labour

Sources of labor in palm sugar processing in Danau Liang Village entirely use labor in the family. The labor in this family includes cleaning bunches, beating bunches, swinging bunches, cleaning roofs, installing roofs, transporting juice, cooking, printing, and packaging. In calculating the workforce, the Working Person's Day (HOK) is used, wherein 1 effective working day is counted as 8 working hours.

Thus, the average labor cost in the palm sugar processing business for one production process in Danau Liang Village is Rp4,052.08 with an outpouring of labor of 1HOK. More details regarding the amount of labor costs in the family can be seen in Table 4.

Table 4 Average Labor in the Nira Tapping Process Business for Making Brown Sugar in Danau Liang Village

No	Type of Activity	Cost (Rp)	Percentage (%)
1	Cleaning of bunches	250	6.17
2	Beating bunch	355.56	8.77
3	Bunch swinging	250	6.17
4	Roof cleaning	250	6,17
5	Roof Installation	250	6,17
6	Mira transport	416.6	10,28
7	Cooking	1,591.67	39,28
8	Printing	385.42	9,51
9	Packaging	302.78	7,47
Total		4,052.08	100.00

Source: Primary Data After Processing (2020)

Table 4 shows the largest cost of using labor in the family is the cost of cooking activities, which is Rp1,591.67 with an outpouring of labor 0.47 HOK and the lowest cost of cleaning bunches, beating bunches, swinging bunches, cleaning roofs, and installing roofs are Rp250.00.

Total Production Costs

Total production costs are costs incurred in processing brown sugar, both fixed and variable costs. The total cost of production incurred by producers in the brown sugar business during one production process in Danau Liang Village is Rp249,348.78. For more details on the total cost of the brown sugar business, seen Table 5.

Table 5 Average Total Cost Palm Sugar Processing Business in Danau Liang Village

No.	Description	of Costs (Rp)	Percentage (Rp)
1	Fixed Costs	1,682.86	0.67
2	Variable Costs	247,665.92	99.33
	Total	249.348.78	100.00

Source: Primary Data After Processing (2020)

Table 5 illustrates the total cost of the brown sugar processing business during a one-time production process in Danau Liang Village which is dominated by variable costs, namely Rp247,665.92 and the remaining fixed costs are Rp1,682.86.

Production and Revenue of Brown Sugar

Revenue is the product of the physical production amount and the price prevailing at that time. The production of brown sugar obtained by producers during one production process is 21.36 kg with the prevailing selling price at the time of the study of Rp15,000/kg. Then the revenue from the processing of brown sugar is Rp320,333.33.

Income and efficiency

The average income of brown sugar producers can be seen in Table 6.

Table 6 Average Total Cost, Revenue and Palm Sugar Revenue in Danau Liang Village

No	Description	Amount (Rp)
1	Revenue (TR)	320,333.33
2	Total Cost (TC)	249,348.78
3	Income (Pd)	70,984.55

Source: Primary Data After Processing (2020)

The analysis of business efficiency or R/C Ratio shows the level of efficiency in brown sugar processing. In Danau Liang Village, the average R/C Ratio value is 1.29, meaning that for every Rp. 1 invested by brown sugar producers, they will receive an income of Rp70,984.55. Thus the brown sugar processing business in Danau Liang Village has been efficient to be cultivated and continued, because an R/C Ratio of 1.29 is obtained which is greater than 1.

Analysis of Added Value for Making Brown

Sugar Brown sugar is made from sap water that has been collected by tappers. The collected sap water is processed by heating until it thickens in the form of a brown dodol and is printed. The process of changing the sap water into brown sugar has changed the original form of the sap water. This is called the value-added process. The added value for sap water is calculated based on the raw material per liter of sap water sold. The selling price used per liter of sap water is the price of sap at the time of the research, which is Rp1,800,- per liter. The availability of sap water is not always fulfilled. This is because tappers are more likely to process sap water into brown sugar rather than selling sap only to buyers. The selling price of brown sugar is more profitable than the selling price of juice per liter. This added value analysis can be calculated using the average value issued in the production process of making brown sugar concerning the added value analysis according to Hayami (1987), Bernard & Spielman (2009), Selvaraj & Ibrahim (2012). The analysis of the added value of brown sugar can be seen in Table 7.

Processing sap into brown sugar requires auxiliary materials/other important inputs including cooking oil, firewood, and tools used in the manufacture of brown sugar (Salvatore, 2002). Because this value-added calculation is for processing per liter of sap, the cost of other auxiliary materials/inputs needed to produce 21 kg of brown sugar is Rp638.00.

Table 7 shows that the conversion factor value is calculated based on the distribution of the distribution between the output value produced and the input value used. To produce a number of these products, 100.20 liters of raw water are needed, so the conversion factor is 0.21 meaning that every 1 liter of processed juice will produce 0.21 kilograms of brown sugar.

The value of the product or brown sugar itself is obtained from the conversion of the selling price of the brown sugar product per kilogram at the time of the study. Then the price or product value is Rp3,150.00 per kg of brown sugar produced.

The workforce used in the manufacture of brown sugar is 1 person, this 1 person performs all the activities of the brown sugar manufacturing process from cooking to printing to completion. With wages per working day is Rp25,000.00. The labor contribution obtained from the product of the labor coefficient and the labor wage is Rp250.00 per liter (seen Table 6). The percentage of employee benefits to the added value is 35.09%. The value of this labor coefficient indicates the amount of labor needed to produce per liter of raw materials. From the labor coefficient, it can be interpreted that processing per liter of sap into brown sugar requires a workforce of 0.01 HOK.

The calculation of added value itself is the difference between the value of the product and the accumulated costs of inputs (raw materials) and other inputs (additives and supporting materials). So, the added value obtained from processing 100.20 liters of sap with the price of raw sap of Rp1,800.00 to become 21 kg of brown

sugar is Rp712 per kilogram and the calculation of the ratio of added value is 22.61%. This means that from Rp721/kilogram of product value, 22.61 percent is added value from product processing, this added value is the gross added value for managers because it has not been deducted by the balance of labor.

Table 7 The results of the analysis of the added value of the Hayami Method in Making Nira Water into Brown Sugar

No.	Variables (Output, Input, Price)	Notation	Value
1.	Yield/production (kg/process)	a	21
2.	Raw materials (kg/process)	b	100.2
3.	Labor (person/process)	c	1
4.	Conversion factor	$a/b = m$	0.21
5.	Coefficient of labor	$c/b = n$	0.01
6.	Average product price (Rp/kg)	d	15000
7.	The average wage (Rp/kg)	e	25000
Income and Profit			
8.	Price of raw material input (Rp/kg)	f	1800
9.	Contribution of other inputs/ (Rp/kg)	g	638
10.	Value of output/product (Rp/kg)	$m \times d = k$	3150
11.	a. Value added (Rp/kg) (10-8-9)	$k - f - g = 1$	712
	b. Value added ratio (%) (11a/10)	$1/k \% = h \%$	22.61
12.	a. Labor benefits (Rp/HK) (5 x 7)	$n \times e = p$	250
	b. Labor share (%) (12a/11a)	$p/1 \% = q \%$	35.09
13.	a. Profit (Rp) (11a – 12a)**	$1 - p = r$	462
	b. Profit rate (%) (13a/11a)	$r/1 \% = 0 \%$	64.91

Source: Hayami, et all. Agricultural Marketing and Processing In Up Land Java.1989

Information: 1989

* = Auxiliary materials

** = Rewards for capital and management

Returns on capital and profits are obtained from the added value minus the amount of labor benefits. The profit from processing sap (palm) is Rp462 per liter with a profit rate of 64.91%. This advantage shows the benefits obtained from each liter of processing raw materials (sap/palm). From the sale of brown sugar, the profit that has been obtained by brown sugar processors is Rp462 per kilogram, with a profit rate of 64.91 percent. It means that 64.91 percent of the selling price is the

profit received by the brown sugar processor. This profit is a net added value because it has been deducted by the labor balance.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the results of the research that has been done, the following conclusions can be drawn:

1. The income obtained by brown sugar producers is Rp320,333.33 with production costs of Rp249,348.78 so it is known that the income earned by brown sugar producers is Rp70,984.55.
2. The added value obtained from processing 100.20 liters of sap with the price of raw sap of Rp1,800 to become 21 kg of brown sugar is Rp712 per kilogram and the calculation of the ratio of added value is 22.61%. This means that from Rp721/kilogram of product value, 22.61 percent is the added value of product processing. The return on capital and profits obtained from the added value of 64.91 percent of the selling price is the profit received by the brown sugar processor.

Suggestion

In terms of processing sap into brown sugar, it is very important to pay attention to the costs incurred for the production process by further optimizing production costs and maximizing brown sugar production, the producers will get greater profits from this brown sugar processing.

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