**ANALYSIS OF THE ADDED VALUE OF THE PALM SUGAR**

**IN RAMBAH DISTRICT, ROKAN HULU REGENCY**

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**ABSTRACT**

Sugar palm is a type of plant that has high economic value. Almost all parts of the palm plant can be utilized, from the roots to the male flower bunches that can produce sap. The sap obtained from palm sugar is processed into palm sugar. The palm sugar processing business aims to obtain added value. The purpose of this study was to analyze the added value of palm sugar in the Rambah District, Rokan Hulu Regency. This research was conducted in Rambah Subdistrict, Rokan Hulu Regency with a survey method in August 2021. The research respondents were 16 sugar palm craftsmen who were taken by the census, namely all craftsmen who process palm sugar in the Rambah District. The data analysis method used is the quantitative descriptive method. The results showed that the added value ratio obtained from palm sugar was 30.20% (medium ratio) which means that palm sugar still has added value so it is feasible to be developed.

**Keywords**: Added Value, Agroindustry, Sugar Palm

**INTRODUCTION**

Sugar palm (*Arenga pinnata merr*) is one type of plant that has high economic value, seen from its increasingly widespread distribution in Indonesia. Palm plants have many benefits ranging from palm leaves to the roots. Usually, the superior products of palm sugar that are often found in the community include brown sugar, ant sugar, fro, fresh sap, and alcoholic beverages. In addition, many sugar palm products are also used as craft materials and materials for building (Manambangtua et al., 2018).

According to (Azhar et al., 2020) sugar palm is one of the potential commodities to be developed because all parts of the sugar palm can be processed into processed food and non-food products so that they can obtain economic value. Processed products produced from one part of the palm (sap) are sugar, beverages (tuak), and bioethanol. Processed products that are produced from the palm fruit part are kolang-kaling, the stem part produces flour.

The palm sap is a liquid that comes out of the palm tree through the tapping process. Usually, this palm sap is easily stale so that the taste of the sap becomes sour, white foamy, and slimy. Efforts made to overcome this local community usually preserve it by giving raru. Raru is a natural preservative derived from leaf materials such as guava leaves, mangosteen leaves, *togong*, and bamboo shoots (Natawijaya et al., 2018). But people in Rambah Subdistrict rarely do this, because the people there usually directly process palm sap into sweets and palm sugar. Palm sap that has good quality will produce good palm sugar. The factors that affect palm sugar individually are the amount of capital, the amount of raw material for palm sap, and the type of packaging to be used (Quddus, 2018).

One product from palm sap that has great income potential is palm sugar. Palm sugar has been widely known by the public because of its distinctive aroma, taste, and color so it is favored by many consumers. In addition, palm sugar is also often mixed by the community as a sweetener in processed foods and beverages (Gunawan et al., 2018). This palm sugar is one of the main sources of income for palm producers who do not have rubber and oil palm plantations, as well as a side income for craftsmen who have rubber and oil palm plantations. Palm craftsmen who process palm sap into sugar mostly have their palm plants and a small number of palm craftsmen do not have palm plants, but are given the trust by the palm plant owners to process sap then the results of the income earned will be divided between the owners and craftsmen with the system The division of 6 days of sap yields is given to craftsmen and 1 day to the owners of palm plants.

According to Julita, (2016) added value is the added value of a commodity because it undergoes a processing process. Palm craftsmen in Rambah District, Rokan Hulu Regency still use simple tools in processing palm sap into palm sugar and palm sugar. With this processing, of course, will provide added value to the palm sap, because the costs are incurred so that new prices and new profits are formed. The purpose of this palm sugar processing is to increase the added value of palm sugar.

Value added is the basic concept of the difference between the input value output. The way to get added value is by reducing the output value with the price of raw materials and other input contributions (Aji et al., 2018). The greater the added value obtained, the better the overall industrial process. Based on the description described above, this study aims to analyze the added value of palm sugar in Rambah District, Rokan Hulu Regency.

**METHOD**

Selection of this location was done purposively, with the consideration that Rambah District is one of the centers of sugar palm production in Rokan Hulu Regency. The time of research was carried out in August 2021.

The research method used was a survey method*.* Methods of data collection using questionnaires, interviews, and documentation. Respondents were taken the census, namely all palm craftsmen who process palm sugar in the Rambah District. Analysis of the data used is descriptive quantitative analysis.

Methods Data analysis was used to analyze the added value of sugar palm agroindustry in Rambah District, Rokan Hulu Regency using the Hayami method.

Table 1. Calculation of Value Added Using the Hayami Method

| **Variable** | **Value** |
| --- | --- |
| Output, Input, and Price |  |
| Output(Kg/Month) | A |
| Raw Material (Kg/Month) | B |
| Labor (HOK/Month) | C |
| Conversion Factor (Kg) | D = A/B |
| Coefficient of Labor (HOK/Kg) | E = C/B |
| Price *of output* (Rp/Kg) | F |
| Revenue and Profits |  |
| Labor wages (Rp/HOK) | G |
| Price of raw materials (Rp/Kg) | H |
| Contribution *inputs* (Rp/Kg) | I |
| value *Output* (Rp) | J = D x F |
| a. Value added (Rp/Kg) | K = JHI |
| b. Value added ratio (%) | L = (K/J) x 100% |
| a. Labor income (Rp/Kg) | M = E x G |
| b. Labor share (%) | N = (M/K) x 100% |
| a. Processing Profit (Rp/Kg) | O = KM |
| b. Profit rate (%) | P =(O/K) x 100% |
| Margin (Rp/Kg) | Q = JH |
| a. Direct labor income (%) | R = (M/Q) x 100% |
| b. Contribution *inputs* (%) | S = (I/Q) x 100% |
| c. Profit (%) | T= O/Q x 100% |

 Source: Baihaqi et al, (2020)

The value added criteria according to Maulana et al., (2018) namely:

* If the ratio value is <15%, then the added value is low
* If the ratio value is between 15- 40%, then the added value is moderate.
* If the ratio value is > 40%, then the ratio value is high.

**RESULTS AND DISCUSSION**

**Plantation Potential**

The Rambah District is one of the 16 sub-districts in Rokan Hulu Regency which is located in the eastern region of Rokan Hulu Regency. The area of ​​Rambah District is 391.59 km2 which oversees 13 villages and 1 sub-district.

Plantation plants are plants that are quite potential in the Rambah District, because of their strategic geographical position. These potential crops include rubber, oil palm, coffee, coconut, cocoa, palm sugar, and areca nut.

Table 2. Plantation area and total production in the Rambah sub-district

| **Crop** | **Area (hectare)** | **Production (tons)** |
| --- | --- | --- |
| Rubber | 4,351 | 3,239.04 |
| Coconut | 37.00 | 12.65 |
| Oil Palm | 2,308 | 8,364.52 |
| Coffee | 46.00 | 19.44 |
| Pinang | 2.00 | 0.82 |
| Cocoa | 5.00 | 2.20 |
| Enau | 4.00 | 6.32 |
| Total | 6,753 | 11,644.99 |

 Source: BPS Rokan Hulu, (2018)

Based on Table 2, it can be seen that most plantation crops in the Rambah District are rubber commodities with an area of ​​4,351 hectares. The largest production is palm oil, which is 8,364.52 tons. The area of ​​sugar palm plantations is 0.06% of the plantation area in the Rambah District with a production of 0.05%.

**Population**

The population density in Rambah District is 132/Km2. The total population of Rambah Subdistrict as of the end of 2020 was 48,242 people consisting of 24,006 male residents (49.76%) and 24,236 female residents (50.24%). For convenience, it can be seen in the following table.

Table 3.Total Area and Population by Gender

| **Village of name** | **Area** **Size****(Km2)** | **Number of****Population****(Soul)** | **Number** |
| --- | --- | --- | --- |
| **of Male** | **Females** |
| Pasir Pangaraian | 17.00 | 1,959 | 1,915 | 3,874 |
| Rambah Tengah Utara | 10.56 | 1,527 | 1,523 | 3,050 |
| Rambah Tengah Hilir | 48.00 | 1,712 | 1,734 | 3,446 |
| Rambah Tengah Hulu | 56.04 | 1,710 | 1,734 | 3,444 |
| Rambah Tengah Barat | 35.10 | 1,968 | 1,918 | 3,886 |
| Menaming | 72.30 | 1,957 | 1,902 | 3,859 |
| Pasir Baru | 10.00 | 599 | 617 | 1,216 |
| Sialang Jaya | 12.00 | 669 | 665 | 1,334 |
| Tanjung Belit | 36.00 | ​​890 | 906 | 1,796 |
| Babussalam | 15.17 | 1,269 | 1,205 | 2,474 |
| Pematang Berangan | 20.12 | 3,718 | 3,799 | 7,517 |
| Likes Maju | 27.30 | 1,959 | 2,147 | 4,106 |
| Koto Tinggi | 22.00 | 3,425 | 3,516 | 6,941 |
| Pasir Maju | 10.00 | 644 | 655 | 1,299 |
| Total | 391.59 | 24,006 | 24,236 | 48,242 |

 Source: Kecamatan Rambah, (2021)

Based on Table 3 above, it can be seen that the Rambah District with an area of ​​391.59 Km2 accommodates a population of 48,242 people. Based on gender, the population is dominated by the female sex as many as 24,236 people, men with a total of 24,006 people. The largest area in Rambah District is Menaming Village, which is 72.3 km2 witha population of 3,859 people.

**Characteristics**

Research respondents totaled 16 palm sugar craftsmen, dominated by the age group 28-60 years categorized as "productive age" (Ukkas, 2017). However, based on the results of research, craftsmen aged >60 years are quite good, both in terms of spirit and physically who are still able to drag and climb high palm trees even reaching 15 meters. In addition, craftsmen who are at this age are better known by the public because of their experience in processing palm sugar.

The last education is dominated by craftsmen who graduated from Elementary School (SD), which means that craftsmen in the Rambah District have a low level of education. Sugar palm craftsmen in the Rambah District still carry out traditional agro-industry activities by utilizing simple tools such as the use of sugar cooking utensils in the form of iron cauldrons. If the craftsman has higher education, it will allow the craftsman to renew the processing for a better one by utilizing modern tools to save time.

 The number of dependents of craftsmen on average is 3-4 people. The greater the number of a person's dependents, the greater the cost of needs that must be incurred to meet daily needs (Adamy, 2016). In Rambah District, family dependents also act as palm sugar processors, one of which plays a role in the palm sugar cooking process.

There are 16 craftsmen, only 2 craftsmen whose business experience is >10 years. This means that 87.50% are craftsmen whose business experience is <10 years. Craftsmen in Rambah Sub-district already have skills in processing palm sugar seen from the quality of the products produced and their long experience. In addition, processing palm sugar is the main job of craftsmen so they are accustomed to doing palm processing activities starting from tapping sap, processing sap into palm sugar to packaging.

**Overview of Palm Sugar Agroindustry Palm**

According to Tarmizi, (2017) palm sugar agroindustry is one of the businesses that are a source of community income. This sugar palm agro-industry is carried out from generation to generation by utilizing palm sap that grows on community land. Sugar palm plants cannot produce sap after producing approximately 10 years. This is due to the frequent conduct of continuous tapping so that the availability of sap is decreasing.

The palm sugar agro-industry in Rambah District is a small household business because the processing is only done at home and uses family labor. Household-scale agro-industry is an agro-industry that has limited capital and uses less than 5 workers (Lestari, 2019). This business includes the main livelihood for 15 craftsmen and a side income for 1 sugar palm craftsman in the Rambah District. The potential of natural resources in the form of an area that has the widest area of ​​sugar palm plantations in Rokan Hulu makes it one of the supports for the ongoing activities of this palm sugar agro-industry in Rambah District. Palm sugar has become a hereditary heritage from ancestors and has become local wisdom for the people of Rambah District. The early history of this palm sugar agro-industry is the belief that this palm sugar agro-industry will continue to run and will not become extinct and the desire to utilize available natural resources for the welfare of life. Until now, palm sugar which was originally only consumed alone has now become one of the typical souvenirs of Rokan Hulu. In terms of marketing, it is no longer a problem for sugar palm craftsmen, because of the large number of requests both within the city and from outside the city. It's just that the available raw materials are decreasing due to continuous tapping, so the palm trees cannot produce sap again after 8-10 years of production (Rukmana, 2019).

The number of palm trees owned by craftsmen varies, the palm trees that are currently in production is palm trees that grow wild and several trees are cultivated. The number of palm trees owned by palm craftsmen is 1-5 palm trees with the number of craftsmen 9 people (56.25%). Meanwhile, the highest number of palm trees, namely >11 trees, was only owned by 2 craftsmen (12.5%).

**Palm Sugar Production Process The palm**

The sugar manufacturing process is:

Figure 1. Stages of Palm Sugar Production Process The palm sugar

stages of palm sugar making by craftsmen are sap filtering, cooking, printing, hardening, and packaging which are shown in Figure 1.

1. Sap screening

At this stage, the sap sugar palm that is accommodated from the tapping is filtered first, then poured into the pan. The purpose of this filtering is to keep the quality of palm sugar clean. This filtering process is carried out for 5-10 minutes depending on the amount of palm sap obtained.

1. Cooking

The sap is cooked in a frying pan on a fire that has been lit. In the cooking process, the sap will foam white and evaporate. To prevent the foam from spilling out, stir it using a shell spoon. At this stage, the fire must be kept in mind, endeavored to keep the fire burning properly because it will affect the cooking time. The cauldron material used also affects the yield of sugar produced. A good skillet material for cooking palm sugar is iron because the iron is thicker and the heat lasts longer. The cooking process is carried out for approximately 3-4 hours until the sap becomes thick and reddish brown in color.

1. Printing

The pan is removed from the furnace, the juice solution is stirred, then put into the mold using a shell spoon. The mold commonly used in Rambah District is a rectangular mold with a sugar content of 0.50 Kg made of rectangular wood and given a small piece of wood as a barrier between sugar and other sugars. This printing process is carried out for approximately 10-15 minutes depending on the amount of sugar produced.

1. Hardening

After printing, the dough is allowed to stand for about 5-10 minutes so that the palm sugar hardens, the method is to let the sugar in the mold be exposed to the wind, after that the small wood that separates the palm sugar is removed, then the palm sugar is reversed from its initial position on its back to tilt, after that it is allowed to stand for a few minutes. more minutes until the sugar has completely hardened.

1. Packaging

After the palm sugar hardens, it is then packaged using dry banana leaves and tied using a sack rope to make it look neater and the wrapper is not opened.

**Palm Sugar Added Value Analysis Value**

Added is the basic concept of the difference between the input value and the output value. The greater the added value obtained, the better an industrial process as a whole. The main components for calculating added value are raw materials, labor inputs, and other contribution inputs (Aji et al., 2018).

Added value is generated from the production process resulting from agro-industry activities. Usually, this added value is obtained from the result of reducing the value of the product with the price of raw materials and other inputs. So the added value is not a net added value because it does not include benefits for workers. The value added ratio itself is the ratio between the added value and the output value (Arianti, 2019).

Calculation of added value can be done using the Hayami method. With this Hayami method, it can be seen what the value of output is against the main raw material unit used. In addition, it can be seen the distribution of added value to labor and remuneration or benefits for owners of production factors ( Prasetiyo, 2018).

Table 3. Calculation of Palm Sugar Added Value Using the Hayami Method

| **Variable** | **Value** | **Palm Sugar** |
| --- | --- | --- |
| Output, Input, and Price |  |  |
| *Output* (Kg/Month) | A | 143.31 |
| Raw Materials (Kg/Month) | B | 740.31 |
| Labor (HOK/Month) | C | 12.87 |
| Conversion Factor (Kg) | D = A/B | 0.19 |
| Labor Coefficient (HOK/Kg) | E = C/B | 0.02 |
| price *Output* (Rp/Kg) | F | 23,397.50 |
|  Income and Profits |  |
| Labor wages (Rp/HOK) | G | 40,000 |
| Price of raw materials (Rp/Kg) | H | 2,912.62 |
| Contribution *inputs* (Rp/Kg) | I | 248.80 |
| value *Output* (Rp) | J = D x F | 4,529 |
| a. Value added (Rp/Kg) | K = JHI | 1.368 |
| b. Value added ratio (%) | L = (K/J) x 100% | 30.20 |
| a. Labor income (Rp/Kg) | M = E x G | 695 |
| b. Labor share (%) | N = (M/K) x 100% | 50.84 |
| a. Processing Profit (Rp/Kg) | O = KM | 673 |
| b. Profit rate (%) | P =(O/K) x 100% | 49.16 |
| Margin (Rp/Kg) | Q = JH | 1.617 |
| a. Direct labor income (%) | R = (M/Q) x 100% | 43.01 |
| b. Contribution *inputs* (%) | S = (I/Q) x 100% | 15.39 |
| c. Profit (%) | T= O/Q x 100% | 41.60 |

 Source: Primery Data, Processed (2021)

Table 3 shows the average amount of production produced by palm sugar for one month is 143.31 Kg/by processing sap as much as 740.31 Liters with a density of sap 1.03 Kg/m3 so that the total juice used is 740.31 Kg with a conversion factor of 0.19. The conversion factor is obtained from the quotient between production and the amount of raw materials used. This shows that each processing of 1 Kg of sap will produce 0.19 Kg of palm sugar.

The value of the product produced by palm sugar is Rp. 4,529 obtained from the product of the conversion factor with the product price, namely Rp. 23,397.50/Kg. The value of this product shows the value of the product produced from processing 1 Kg of raw materials. The contribution of other inputs of palm sugar is Rp. 248.80/Kg was obtained from the result of dividing the total cost of other inputs by the amount of raw materials used for the product. Other inputs used for palm sugar consist of raru, firewood, banana leaves, and matches.

The added value obtained from 1 Kg of palm sugar is Rp. 1.368/Kg. This added value is obtained from the result of reducing the value of the product with the price of raw materials (sap) and the contribution of other inputs. The added value ratio obtained is 30.20%, which means that the processing of sap into 1 Kg of palm sugar provides an added value of 30.20%.

Wages received by direct labor to process 1 kg of palm sap are called labor income. The labor income from processing 1 Kg of sap to 0.19 Kg of palm sugar is Rp. 695/Kg. This means that for every 1 kg of palm sap that is processed into palm sugar, a labor cost of Rp. 695. Labor income is obtained from the product of the coefficient of labor and labor wages. The labor share is the percentage of direct labor income from the added value obtained. The percentage of the share of labor to the added value of palm sugar is 50.84% ​​which is obtained from the profit sharing of labor with added value.

The profit obtained by palm sugar craftsmen is Rp. 673Kg. This means that for every 1 kg of palm sugar, a profit of Rp. 673 which is obtained from the reduction of value added with labor income. With a profit rate of 49.16% obtained from profit sharing with added-value. This profit shows the total profit obtained by the craftsmen from each Palm Sugar processing. The difference between the value of the product and the price of raw materials (sap) is called the margin. Processing 1 Kg of palm sugar obtained a margin of Rp. 1,617 which are distributed for each labor factor, namely labor income which is the percentage of direct labor income from the added value obtained by 43.01%, the contribution of other inputs which is a percentage of the results for the contribution of other inputs, and a margin of 15.39 %. The profit obtained from palm sugar is 41.60%.

From the calculation of the added value of Palm Sugar using the Hayami Method Formula, it can be explained that the ratio value obtained from palm sugar is included in the medium ratio category, namely 30.20%, which means that the palm sugar agro-industry business is still gaining added value so it is feasible to be developed (Maulana et al., 2018).

**CONCLUSION**

The added value obtained from palm sugar is Rp. 1.368/Kg with a ratio value of 30.20% (medium ratio). Based on the value of the palm sugar ratio, it means that the palm sugar business is feasible to run.

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