Agro Bali : Agricultural Journal
Vol. 5 No. 3: 470-476, November 2022
e-ISSN 2655-853X
https://doi.org/10.37637/ab.v5i3.1049

Comparative Analysis of Added Value of Green Bean and Roast Bean in Bener Meriah Regency, North Sumatra Province, Indonesia

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Article history: submitted: October 3, 2022; accepted: November 4, 2022; available online: November 28, 2022

Abstract. This study aims to determine the amount of added value in the processing of coffee beans (Green bean) and coffee roast beans in Keramat Jaya Village, Bandar District, Bener Meriah Regency per one process. Methods The determination of the sample in this study, namely arabica coffee farmers who process logs of coffee (Cherry red) into coffee beans (Green bean) totaling 12 farmers will be sampled. Meanwhile, Green Bean coffee processors will be determined by the snowball sampling method. The results of this study indicate that the added value in the business of processing coffee logs (Cherry Red) into coffee beans (Green beans) has an added value ratio of 29.7%. The added value in the business of processing green beans into Roast Bean coffee has an added value ratio of 38.17%.
Keywords: Arabica coffee; value-added; Hayami Method

INTRODUCTION

The development of agricultural industry products will provide added value and create job opportunities. The condition of the available resources in rural areas is quite a lot to support agricultural business, so that the industry that is considered suitable for rural areas is agro-industry (Fadli et al., 2021; Siyum et al., 2022). One of the natural resources that have high economic value is coffee. Coffee is a mainstay of export commodities and a source of foreign exchange for the country (Hasman & Satia, 2020; Hayami et al., 1987). The processing steps were carried out starting from arabica coffee beans which then underwent a process of breaking the horn skin and then processed into ground coffee. In 2016 coffee productivity was 1,141 Kg.ha-1, in 2017 coffee productivity was 1,072 kg.ha^{-1}, in 2016 In 2018 coffee productivity was 1,084 kg.ha^{-1}, in 2019 coffee productivity was 1,080 kg.ha^{-1} and in 2020 coffee productivity was 1,086 Kg.ha-1. Although North Sumatra is ranked as first producer in Indonesia, however coffee productivity fluctuating year by year (Afriliana, 2018; Satia et al., 2021).

The existence of added value is formed because there is a change in the shape of the original product, so when the formation of added value occurs, there is an increase in income by farmers. The added value obtained by Arabica coffee producers is by processing coffee from red logs into coffee beans and roasted coffee beans. So that the process has a difference between the value of the product and the value of the raw materials. Most of the Arabica coffee farmers who sell their coffee production in the form of red logs (cherry red) are offered at a price of IDR. 6,000-7,000/bamboo and one bamboo is about 1.5 kg and if it has been processed into coffee beans, the price offered is IDR. 38.000-40.000/kg, and the price for Roast Bean coffee is IDR. 90.000-100.000/kg.

However, there are still many farmers who sell coffee production in the form of logs, which causes low income at the farmer level. Thus, researchers are interested in analyzing the added value of coffee beans and roasted beans (Wardah & Budi, 2018). The value added process is formed when there is a change in the shape of the original product, so that the formation of added value is important for farmers to increase their income. This study aims to determine the value added to coffee beans (green beans) and coffee roast beans (Akhmad et al., 2019; Central Bureau of Statistics, 2019)

The aims of the research to analyze the economic value of the process of changing (Cherry red) into green beans, analyzing the economic value of the conversion process

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v5i3.1049

(Green bean) to Roast Bean, and to Finding an alternative policy for developing Arabica coffee so that Arabica coffee farmers can accelerate their income increase.

METHODS

The determination of the research sample area was carried out by purposive area sampling, namely in Keramat Jaya Village, Bandar District, Bener Meriah Regency, Aceh Province based on the consideration that the research village is certain (*non Probability sampling*). The research area was chosen intentionally with the consideration that this research area is one of the Arabica coffee-producing areas in Bener festive district.

The entire population in this study, namely arabica coffee farmers who process logs of coffee (Cherry red) into coffee beans (Green beans) totaling 12 farmers will be sampled. Meanwhile, Green Bean coffee processors will be determined by the snowball sampling method. The data collected in the study are primary data and secondary data. Primary data were obtained directly through interviews with respondents using a list of questions (questionnaires) by asking several questions to complete the required data, with the aim that the questions asked were structured and complete. The Hayami method has the advantage that it can determine the amount of added value and output and can determine the amount of remuneration for the owners of the production factor.

RESULTS AND DISCUSSION

Keramat Jaya Village is a village in Bener Meriah Regency which is a center for Arabica coffee production with an altitude of 1,260 meters above sea level. Some of the villager's plant in the form of logs (Cherry red) which through the fermentation process, will produce coffee beans (Green beans). Meanwhile, the processing of coffee beans (Green beans) into Coffee Roast beans is carried out by entrepreneurs, which is usually done in cafes such as the Sekar Gayo Coffee cafe.

The added value of processing red cherry into green beans

The analytical method used is the Hayami method to determine the added value obtained from processing logs of coffee (Cherry Red) into coffee beans (Green beans). The added value measured is the added value resulting from processing logs of coffee (Cherry Red) into coffee beans (Green beans). As for the processing of the type of coffee that is processed is Arabica coffee. As for the amount of added value generated from the processing of coffee logs (Cherry Red) in producing green beans, the Hayami method is used. The calculation of the added value using the Hayami method is presented in the form of a table as follows.

Processing Cherry red into coffee beans (Green beans) using raw materials as much as 1220 kg and can produce a total output of 244 kg so as to produce a conversion factor of 0.2. This conversion value indicates that each processing of 1 kg of coffee cherries can produce 0.2 kg of green beans. In the processing process using a workforce of 8.43 working days. So the coefficient of labor used to produce 1 kg of coffee beans (Green beans) is 0.006 working days. As for the price, the average raw material for green bean processing business in the study area is IDR.6.000/ kg of raw materials. Meanwhile, the contribution of other inputs is IDR. 940.2.

The output price of green beans is IDR 50,000/kg and the output value is 10,000/kg. It can be seen that the added value obtained from the business of processing logs of coffee (Cherry red) into coffee beans (Green beans) is IDR. 2,974 which is obtained from the output value minus the input price of raw materials and other input contributions, with a value added ratio of 29.7% which means 29.7% of the output value is the added value obtained from the processing of ground coffee (Cherry red) into coffee seeds (Green beans).

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v5i3.1049

Table 1. Added value of green bean processing

No	Variable	Formula	Mark
	Output, Input, Price		
1.	Production Results (Kg/Production)	A	244
2	Raw Materials (Kg/Production)	B	1220
3.	Labor Input	C	8.43
4.	Conversion Factor	D = A/B	0.2
5.	Labor Coefficient	E = C/B	0.006
6.	Production Price (IDR /Kg)	F	50,000
7.	Average Wage (IDR /working days)	G	5.338
8.	Raw Material Input Price (Rp/Kg)	H	6,000
9.	Contribution of Other Inputs (Rp/Kg)	I	1.026
1	Output Value (Rp/Kg)	J = Dxf	10,000
11.	a. Added Value (IDR/Kg)	K = J – H – I	2,974
	b. Value Added Ratio (%)	L% = K/H x100	29.74%
12.	a. Labor Income (IDR/Kg)	M = E xg	36.88
	b. Labor Share (%)	N% = M/K x100%	1.24%
13.	a. Profit (IDR/Kg)	O = K – M	2937.1
	b. Labor Income (%)	R% = M/Q x100%	0.92%
	c. Other Input Donations (%)	S% = I/Q x100%	25.6%
	d. Processor Profit (%)	T% = O/Q x 100%	73.4%
	e. Profit Rate (%)	P% = O/H x100%	29.3%
	Remuneration for Factors of Production		
14.	Margin (IDR/Kg)	Q = J – H	4000

Source: Primary Data, 2021

In determining the added value using the Hayami method, the use of labor is considered a benefit, so it is necessary to analyze the amount of labor income (Miller & Roger E.Meiners, 1999). Labor Income obtained from the product of the coefficient of labor with the average wage of IDR. 36.88/kg with the labor share of 1.2%. The profit obtained from the business of processing logs of coffee (Cherry red) into coffee beans (Green beans) is IDR.2,937/kg, with a profit share of 29.3%.

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v5i3.1049

Table 2. Added value of roast bean coffee processing

No	Variable	Formula	Mark
	Input , Output , Price		
1	Yield (kg/production)	A	200
2	Raw material kg/production)	B	250
3	Labor (working days)	C	20
4	Conversion factor	D = A / B	0.8
			0.08
5	Labor coefficient	E = C / B	130,000
6	Production price (IDR/kg)	F	85,000
7	Average wage (IDR/working days)	G	50,000
	Income and Profit		
8	Price of raw materials (IDR/kg)	H	14,300
9	Additional Materials (IDR/kg)	I	104,000
1	Product Value (IDR/kg)	J = D x F	39,700
11	a. Added Value (IDR/kg)	K = J – H – 1	
	b. Value Added Ratio (%)	L = K/J x 100%	38.17%
12	a. Direct Kindergarten Rewards (IDR/kg)	M = E x G	6800
	b. Direct Kindergarten Share N%= M/K x (%)	100%	17.12%
13	a. Profit (IDR/kg)	O = K – M	32,900
	b. Profit Rate %	P % = O / J x 100%	31.63%
Remuneration for Factors of Production			
14	Margin (IDR/kg)	Q = J – H	54,000
	a. M/Q x Income (%) x 100%	Direct Kindergarten R%= 100%	12.5%
	b. Other Input Donations (%)	S%= I/Q x 100%	26.48%
	c. Entrepreneur Profit (%)	T % = O/ Q x 100%	60%

Source: Primary Data, 2021

From the value added analysis table of the Hayami Method, it can be seen that the margin obtained from the output value minus the input price of raw materials is IDR. 4,000/kg, with a percentage of labor income of 0.92%, contribution of other inputs of 25.6% and profit processing by

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v5i3.1049

73.4%. From the results of the study, it was found that the value added in the business of processing coffee logs (Cherry Red) into coffee beans (Green beans) was IDR. 2,974 with a value added ratio of 29.7%. If the added value > 0 means that the business of processing logs of coffee (Cherry Red) into coffee beans (Green beans) provides added value (positive) (Furyanah & Maharani, 2019; Kuheba et al., 2016; Sembiring et al., 2015).

The added value of processing Green Beans into Roast Bean Coffee

The Hayami Method is used to see how much added value is produced from the green bean processing to produce Roastbean coffee. The procedure for calculating added value using the hayami method is presented in table 2 as follows. Processing green beans into Roast Bean coffee using 250 kg of raw materials can produce a total output of 200 kg, resulting in a conversion factor of 0.8. This conversion value shows that each processing of 1 kg of coffee beans (Green beans) can produce 0.8 Roastbean coffee. In the process using as many as 20 working days. So the coefficient of labor used to produce 1 kg of coffee beans is 0.08 working days.

The average price of raw material input for Roast Bean coffee processing business in the research area is IDR 50,000/kg of raw materials. Meanwhile, the contribution of other inputs is IDR. 14,300. Roasting coffee output price is IDR. 130,000/kg and the output value is IDR 104,000/kg. It can be seen that the added value obtained from the business of processing green beans into Roast Bean coffee is IDR. 39,700 obtained from the output value minus the input price of raw materials and other input contributions, with a value added ratio of 38.17% which means 38.17% of the output value is the added value obtained from the processing of green beans into coffee. Roastbean Labor income obtained from the product of the coefficient of labor with the average wage of IDR. 6800/kg with a share of labor of 17.12%. The profit obtained from the business of processing green beans into roasting coffee is IDR. 32,900/kg, with a profit share of 31.63% (Martauli, 2018; Rahardjo, 2012).

Then result showed that the margin obtained from the value of the output minus the input price of raw materials is IDR. 54,000/kg, with the percentage of labor income of 12.5%, the contribution of other inputs of 26.48% and processing profit of 60%.

From the results of the study, it was found that the value added to the business of processing green beans into Roast Bean coffee was IDR.39,700 with a value-added ratio of 38.17%. If the added value > 0 means that the business of processing green beans into Roast Bean coffee provides added value (positive).

Differences in Coffee Beans (Cherry red), Coffee Beans (Green Bean) and Roastbean

The difference between the selling price and the profit for coffee logs (Cherry red), coffee beans *(Green Beans)* and Roastbean coffee can be seen in table 3 as follows.

Table 3. Differences in Selling Prices and Profits for Coffee Beans (Cherry Red), Coffee Beans (Green Beans) and Roast Bean Coffee

No	Coffee Type	Selling price (IDR)	Profit (IDR)
1	Coffee logs (Cherry red)	6,000	-
2	Coffee beans (Green beans)	50,000	2,937
3	Roast Bean Coffee	130,000	32,900

Source: Primary data, 2021

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v5i3.1049

In Table 3 it can be seen that the selling price for coffee logs (Cherry red) is IDR. 6000 and for coffee beans (Green bean) it is IDR. 50,000 and for roast bean coffee is IDR. 130,000. The profit of green beans is IDR.2,937 and roast bean coffee is IDR.32,900.

There is a fairly large margin between processing cherry red to green beans or cherry red to roast beans. What farmers do in the research area is processing arabica coffee from cherry red into green beans after being sold to roasters, the green beans will be roasted and ground coffee or roasted coffee beans to be served to coffee connoisseurs or exported.

Currently, arabica coffee farmers who sell green bean products do not understand that the added value obtained is so great if farmers sell products in the form of roast beans. So farmers need policies to help understand this to be implemented by farmers in order to increase the income of Arabica coffee farmers in Bener Meriah. Some of the policies expected by Arabica coffee farmers in order to increase their income are as follows: (1) Dissemination of processing technology to farmers which includes an increase in the conversion of cherry red to green beans by more than 20 percent, (2) Socialization Fast drying technology that can reduce moisture content, (3) Providing assistance with roaster machines for Arabica coffee farmer groups, (4) Provide assistance in the management of powdered coffee packaging, (5) Providing assistance for civet coffee cultivation, (6) Socialization of organic coffee cultivation and (7) Provide assistance with the ease of export permits (Satia et al., 2021).

The target to be achieved from this policy is for farmers to have sufficient space to increase the added value of products which does not only lead to technical aspects but includes product exports. This will increase the income of Arabica coffee farmers to be more productive over time

CONCLUSION

The added value in the business of processing coffee logs (Cherry Red) into coffee beans (Green beans) has an added value ratio of 29.7%. The added value in the business of processing green beans into Roast Bean coffee has an added value ratio of 38.17%.Arabica coffee farmers are dominated by green bean coffee producers compared to roast beans.Government and private assistance are needed to form farmer partnerships in terms of Arabica coffee processing.

ACKNOWLEDGMENT

The research was funded by Universitas Sumatera Utara through the Non PNBP Fund Fiscal Year 2021 based on the Implementation Contract Research Fiscal year 2021 between the Rector and the chairman of Universitas Sumatera Utara Research Institute.

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