

## Article

# Feasibility and Added Value of the Robusta Coffee Agroindustry in Kebun Tebu District, West Lampung

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**Abstract:** The study aims to identify the characteristics of the ground coffee industry products, feasibility, and the added value of ground coffee in the Kebun Tebu District of West Lampung. The research method that the ground coffee industry will use in the Kebun Tebu sub-district uses qualitative descriptive analysis to identify the feasibility of the ground coffee business using the R/C and B/C ratio indicators, and the amount of added Value resulting from ground coffee processing is calculated using the Hayami method. The research results show that Coffee bean processing activities are financially feasible for the West Lampung Kebun Tebu industry to undertake and continue. They are also feasible for the community because they are economically profitable. Feasibility analysis based on the R/C and B/C ratio indicators shows that the ground coffee business with honey and natural processes has  $R/C > 1$  and  $B/C > 0$  or is worthy of business. The added value resulting from natural and processed ground coffee honey is classified as having a high value-added ratio because the Value added ratio is  $>40$  percent, and processing ground coffee is a capital-intensive activity.

**Keywords:** robusta coffee; agroindustry; kebun tebu district, robusta coffee agroindustry

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## 1. Introduction

Smallholder coffee production in Lampung Province mainly produces robusta coffee. The most significant Contribution reached 96.88% of the total robusta coffee production in Lampung Province, namely 110.57 thousand. West Lampung Regency very significantly contributes to robusta coffee production of up to 52.57 thousand tons or a share of up to 49.93% of the total robusta coffee production in Lampung Province in the form of coffee beans [1]. [2] stated that the final target of coffee cultivation is a high-tasting bean product, making coffee drinks increasingly popular and becoming a trend in society.

The increase in coffee consumption in Indonesia during the 2016-2023 period is predicted to grow by an average of 8.22%/year. In 2023, coffee supply is predicted to reach 795 thousand tons with consumption of 370 thousand tons, resulting in a surplus of 425 thousand tons [3]. Consumption of coffee drinks has been associated with several health benefits, such as a reduced risk of chronic diseases such as cancer and diabetes and a reduction in oxidative damage caused by free radicals [4]. The bioactive content contributing to the drinker's health cannot be separated from the post-harvest coffee method.

Post-harvest processing stages are the main factors contributing to producing high-quality coffee [5]. [6] West Lampung coffee farmers use natural and natural pulp (honey) and dry processing methods. Coffee beans produced by West Lampung coffee farmers are a raw material that coffee shops in Bandar Lampung seek because they have a taste that consumers like. Coffee beans produced by Tebu Garden farmers have moderate

antioxidant activity [7], farmers have carried out GMP procedures well [8] and produce premium quality grades of coffee beans [9] [10]. Apart from meeting the demand for coffee beans, farmers process ground coffee with certain brands, motivating farmers to develop the ground coffee industry business. The process of processing ground coffee will increase the added value of coffee. The calculation of added Value is calculated based on the dry processing process at the farmer level, namely natural and honey processing. Different processing processes will produce different added Value [11]. Differences in the green bean processing process in two different locations also produce different added Value.

The coffee agroindustry can be used as a mainstay product of Liwa West Lampung as a souvenir product sought by visitors who travel to West Lampung by providing unique product characteristics. [12] stated that products that have regional design characteristics can compete in the market. [13] added that by implementing a quality product development strategy in this research, the ground coffee produced impacts the drinker's health. The purpose of the study is to determine the product attributes of the ground coffee industry and evaluate the viability of the coffee business using the R/C and B/C Ratio indicators. Additionally, an analysis of the added value generated by the dry processing of ground coffee in Kebun Tebu District, West Lampung, is conducted.

## 2. Materials and Methods

The research method used is the ground coffee industry in the Kebun Tebu sub-district using descriptive qualitative and quantitative analysis. The observation was carried out in the research for data collection, where researchers reviewed the field directly and conducted interviews with ground coffee industry players. A ground coffee business feasibility analysis was applied to evaluate the sustainability of the people's coffee industry processing business. The value-added analysis approach of ground coffee products to evaluate whether the ground coffee industry provides added Value or not. The research flow chart can be seen in Figure 1.

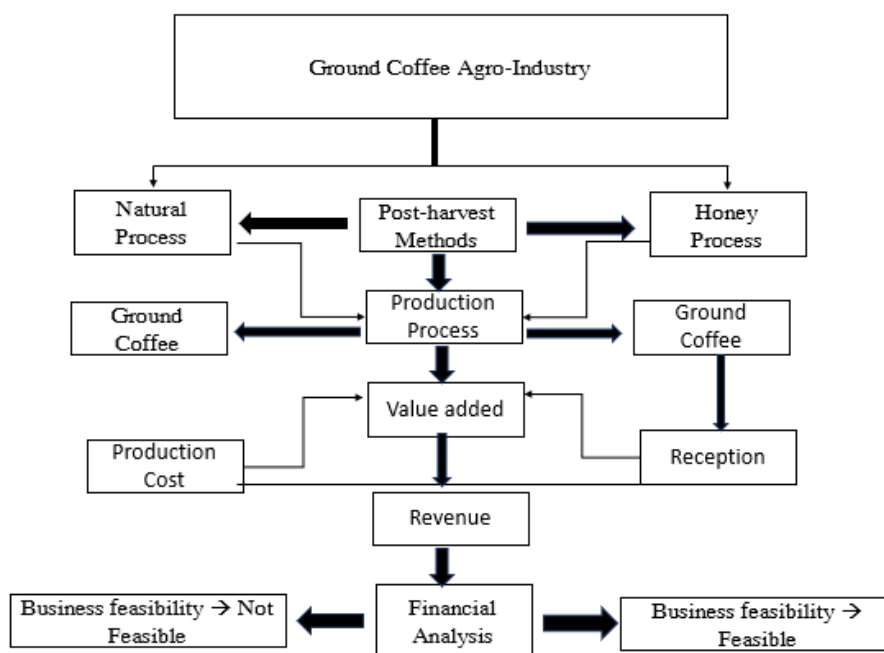


Figure 1. Research Methodology

The identification of business feasibility and value-added analysis focused on industrial activities that produce ground coffee with natural and honey post-harvest methods (dry processing) [10] in industries that have been doing business for more than ten years. Processing business feasibility activities in the Kebun Tebu District, West Lampung ground coffee industry were analyzed using the Net Revenue Cost Ratio (Net R/C) and Net Benefit Cost Ratio (Net B/C). The calculation of R/C and B/C requires income analysis [14].

The feasibility of the ground coffee product business will produce added Value to the coffee commodity, which is then processed into ground coffee. The amount of added Value from processing ground coffee can be calculated using the Hayami value-added analysis method. Hayami's value-added analysis method is presented in Table 1.

**Table 1.** Analysis of the Added Value of the Hayami Method

Hayami Method Added Value Analysis			
Variable	No	Sub Variable	Information
Output, input, and price	1	Output (Kg)	(A)
	2	Raw material input (Kg)	(B)
		Labor input (JKO)	(C)
	4	Conversion factor	(D) = (A)/(B)
	5	Labor coefficient (JKO)	(E) = (C)/(B)
	6	Output price	(F)
	7	Labor wages	(G)
	8	Price of raw material input (Rp/Kg)	(H)
	9	Contribution of other inputs (Rp/Kg)	(I)
Receipt of profits and	10	Output value (Rp/Kg)	(J) = (D) x (F)
	11	A. Added value (Rp/Kg)	(K) = (J) - (I) - (H)
		B. Value added ratio (%)	(L) = (K)/(J) x 100
	12	A. Labor income (Rp/hour)	(M) = (E) x (G)
		B. Share of Labor (%)	(N%) = (12a)/(11a)x 100
Remuneration for the owner of the factors of production	13	A. Profit (Rp/Kg)	(O) = (11a) - (12a)
		B. Profit rate (%)	(P%) = (O)/(J) x 100
	14	Margin (RP/Kg)	(Q) = (J)-(H)
		A. Labor income	(R%) = (M)/(Q) x 100
		B. Contribution of other inputs	(S%) = (I)/(Q) x 100
		C. Company profits	(T%) = (O)/(Q) x 100

Source: [15]

Data provided in the table are data used for one month of production of ground coffee production analysis: A = Output/total production of ground coffee produced based on industry scale; B = Input/raw materials used (coffee beans); C = Labor used based on industry scale; F = Product price prevailing in 2022; G = Average wage received by workers Rp. 50,000; H = Price of the primary raw material of coffee beans per kilogram (Kg) in 2022; I = Other input costs, namely auxiliary materials such as packaging materials.

Value-added criteria: a. If  $NT > 0$ , it means that the development of the ground coffee processing industry provides added Value (positive); b.If  $NT < 0$ , it means that the development of the ground coffee processing industry provides added Value (negative).

Based on [16], the following are some value-added ratio indicators: A value-added ratio of less than 15% indicates a low added value; a value-added ratio of between 15% and 40% indicates a medium added value; and a value-added ratio of more than 40% indicates a high added value.

### 3. Results and Discussion

#### 3.1. Feasibility agroindustry coffee

The calculation of coffee business income is divided into two different processes: ground coffee with the honey process and the natural process. Costs are all costs incurred for making ground coffee, starting from costs incurred or not incurred. These costs consist of variable costs and fixed costs.

Business feasibility involves calculating the income of the coffee industry, which is divided into two different processes, namely ground coffee with honey process and natural process. Costs are all costs incurred for making ground coffee starting from costs that are actually or not actually incurred. These costs consist of variable costs and fixed costs.

Variable and fixed costs of honey-processed and natural processed products are calculated separately because there are differences in costs, such as the price of raw materials and tools used. Analysis of variable and fixed costs can help business actors understand the cost structure of the business being carried out. This can help businesses make better decisions related to the production process, selling price, profit amount, and long-term financial planning. The results of the analysis of the two coffee products, both Honey coffee and Natural coffee, are different, as can be seen in Table 2.

**Table 2.** Comparative Results of Analysis of Honey and Natural Coffee

Information	Honey coffee (Rp)	Natural coffee (Rp)
Fixed cost	24.885.000	24.885.000
Variable Costs	55.477.143	49.477.143
Total Cost	80.362.143	74.362.143
Reception	120.000.000	96.000.000
Income	39.637.857	21.637.857
R/C	1,49	1,29
B/C	0,49	0,29

Source: Processed data, 2023

Table 2 summarizes the cost of business feasibility in the ground coffee business of the two products. Fixed and variable costs incurred by Honey Coffee and Natural Coffee only differ in variable costs, with a difference of  $\leq$  Rp 6,000,000. The price of different raw materials from each product influences these costs. Honey Coffee obtained the highest revenue and income compared to Natural Coffee. R / C Honey coffee of 1.49 and R / C Natural coffee 1.29 means that every use of Rp 1 will provide a profit of 1.49 Honey coffee and 1.29 Natural coffee from each coffee shows a value  $> 1$  so that both ground coffee processing businesses are profitable and feasible to run. This is by research [17]. The Tukur, Pasuruan, ground coffee agroindustry produces more than one Value of the revenue ratio (R/C), which indicates that the business is profitable and feasible to run. Furthermore, [18] stated that the ground coffee industry in Jember City is financially feasible to continue because the feasibility criteria have been met. Ground coffee agroindustry in Lampung Province is feasible and profitable with a B/C ratio value of 1.02-1.32 higher than the B/C research results [19].

#### 3.2. Added Value of ground coffee

Value-added is a reward for Labor and profit for producers [20] Value-added is mainly done in the downstream sector, which involves downstream industries in the processing. In this study, the Value added was calculated based on dry processing carried out by West Lampung Sugar Cane Farm farmers from coffee beans to ground coffee (Table 3).

Making green bean coffee into honey and natural processed ground coffee is an activity of changing the form of the product to produce added Value. Farmers can feel the benefits of value-added activities because they can increase the selling price of the product. In addition, ground coffee can also be an additional monthly income for ground coffee business actors. The amount of added Value is calculated using the Hayami value-added method. Coffee raw materials processed into ground coffee are coffee harvested by farmers themselves. The price of green bean coffee for honey and natural processing is different. The selling price of green bean coffee for honey processing is Rp25,000/kg, which is more expensive than natural processing. Natural coffee processing is done by drying coffee cherries on the surface of plastic mats in the sun. Coffee cherries must be flipped over on a regular basis during the drying process in order to ensure that the coffee beans dry uniformly and prevent mold or rotting. The dried coffee cherries maintain their cherry shape and coffee layers during the natural processing method. Therefore, this process will make the coffee cherries naturally fermented during drying. After the coffee cherries have dried, the coffee cherries are peeled off the skin to become green beans that are ready to be sorted before entering the coffee powder production stage.

The 150 kg of coffee beans from the natural processing will produce 120 kg of ground coffee. Unlike honey process coffee, the coffee cherries in this process will be dried on para-para. But in the honey method, the cherries will be broken using a mechanical machine and use less water. The pulper machine will be controlled to determine how much pulp will adhere to the beans before drying. The pulp left on the coffee, which in Spanish means honey or mucilage, is the source of sweetness to the coffee beans.

**Table 3.** Added Value of ground coffee from dry processing (natural and honey)

No	Variable	Formula	Value (Honey)	Value (Natural)
<b>I. Production Results, Materials, and Prices</b>				
1	Ground Coffee (Kg)/production		120,00	120,00
2	Green bean coffee (Kg)		150,00	150,00
3	Labor (hok)		1,29	1,29
4	Conversion Factor	$4 = 1/2$	0,80	0,80
5	Labor Coefficient	$5 = 3/2$	0,01	0,01
6	Price of ground coffee/kg		125.000,00	100.000,00
7	Labor Wages (Rp) (HOK)		50.000,00	50.000,00
<b>II. Revenue and Profits</b>				
8	Price of Raw Materials (Rp/Kg)		40.000,00	35.000,00
9	Other input prices (Rp/Kg)		6.597,00	6.597,00
10	Ground coffee value (Rp/Kg)	$10 = 4 \times 6$	100.000,00	80.000,00
11	a. Added Value (Rp/Kg)	$11a = 10 - 9 - 8$	53.403,00	38.403,00
	b. Value Added Ratio (Rp/Kg)	$11b = (11a/10) \times 100$	53,40	48,00
12	a. Kindergarten Rewards (Rp/Kg)	$12a = 5 \times 7$	430,00	430,00
	b. Kindergarten Share (%)	$12b = (12a/11a) \times 100$	0,81	1,12
13	a. Profit (Rp/Kg)	$13a = 11a - 12a$	52.973,00	37.973,00
	b. Profit Rate (%)	$13b = (13a/11a) \times 100$	99,19	98,88
14	Profit margin (Rp/Kg)	$14 = 10 - 8$	60.000,00	45.000,00
	a. Kindergarten income	$14a = (12a/14) \times 100$	0,72	0,96
	b. Other Input Contributions	$14b = (9/14) \times 100$	11,00	14,66
	c. Entrepreneur Benefits	$14c = (13a/14) \times 100$	88,29	84,38

Source: Primary data processed, 2023

Table 3 shows that the yield to produce natural and honey-processed ground coffee is 1:0.8, which means that 1 kg of green bean coffee produces 0.8 kg of ground coffee. Changes in the amount of coffee occur because the coffee experiences weight shrinkage due to roasting activities. This roasting activity uses gas energy. Ground coffee from roasting and which has been ground is then packaged using attractive packaging for high-selling value. The Labor required for making honey and natural ground coffee is only one working day. The Labor required to make natural and honey-ground coffee is careful and tenacious. One person-day is equivalent to eight hours of work. The direct labor coefficient for the coffee-making process is 0.01. The average natural and honey-ground coffee production wage is IDR 50,000/HOK. This labor wage is still below the regional minimum wage in the West Lampung district because the specified type of work does not require high job qualifications, and no special skills are required in the production process [21]. Other input contributions in producing honey and natural ground coffee are packaging, gas, electricity, and equipment depreciation costs.

Product value is obtained by multiplying the conversion factor by the product price. Honey and natural ground coffee processes have different product values, namely Rp120,000/kg for honey ground coffee products and Rp 100,000/kg for natural ground coffee products. This value means that each processing of one kilogram will produce a honey ground coffee value of Rp125,000 and natural ground coffee of Rp100,000. These product values show the gross revenue per kilogram of green bean raw material processed into ground coffee.

If the product's value multiplied by the conversion factor is reduced by the Value of output and the Contribution of other inputs, the Value added is Rp53,403 for honey and Rp38,403 for natural. Value-added means that everyone kilogram of green bean coffee processed will generate a profit of Rp52,973 for honey and Rp37,973 for natural. If the value-added is divided by the product value, the value-added ratio will be 53.4 percent for honey and 48 percent for natural. This added value is gross added Value for business actors because it still contains rewards for Labor and profits of business companies. According to [16] the value-added ratio is said to be low if it has a percentage below 40%. Based on these criteria, it can be obtained that the added Value of ground coffee in the honey process is classified as a high value-added ratio because the added value ratio is >40 percent.

The reward for Labor in the production process of natural and honey-ground coffee is Rp430, which means that the share of Labor in the Value added in coffee processing is 0.81% and 1.12%. The reward for Labor is the income received by Labor due to multiplying the coefficient per HOK. Labor reward is the income Labor earns from each processing of one kilogram of coffee beans. This process's labor reward depends on the number of working days and the prevailing wage. Processing bean coffee has provided benefits to farmers. The profit obtained by farmers converting bean coffee into honey and naturally processed ground coffee is Rp52,973 and Rp37,973 per kilogram of raw materials. The profit is already the result of reduced value-added minus labor remuneration. The level of profit obtained by farmers in processing honey and natural coffee is 88.29 and 84.38 percent.

The Contribution of production factors other than the primary raw materials is shown through the margin obtained by subtracting the output value from the raw materials price. The processing of honey and natural ground coffee requires inputs other than raw materials, namely Labor, packaging, gas, and electricity. The margin obtained from the results of added Value is 60,000/kg and 45,000/kg. The amount of margin will be distributed to the factors of production consisting of 0.72 percent of the honey process and 0.96 percent of the natural process for Labor, 11.00, and 14.66 percent for profit. The amount of margin distributed for profit is more significant than labor income, so it is concluded that ground coffee processing is a capital-intensive activity. In this case, capital-intensive activities are associated with the amount of capital, namely expenditure for

investment of Rp 23,450,000 incurred by the company from the use of inputs other than Labor.

#### 4. Conclusions

Coffee bean processing activities are financially feasible for the West Lampung Kebun Tebu industry to undertake and continue. They are also feasible for the community at large because it is economically profitable to do so. Feasibility analysis based on the R/C and B/C ratio indicators shows that the ground coffee business with honey and natural processes has  $R/C > 1$  and  $B/C > 0$  or is worthy of business. The added Value resulting from natural and processed ground coffee honey is classified as having a high value-added ratio because the Value-added ratio is  $>40$  percent, and processing ground coffee is a capital-intensive activity.

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