

Coffee Agroindustry in South Konawe Regency, Southeast Sulawesi Province, Indonesia: A Case Study

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Abstract

The leading agricultural commodities in South Konawe Regency consist of several types, such as coffee, coconut, pepper, and patchouli. Among these various flagship commodities, only coffee has undergone a successful downstream process by the farmers. This is based on the support from the South Konawe Regency, such as providing special fertilizer assistance to coffee farmers and even assistance for the innovation of packaged ground coffee products for household industry players. The purpose of this research is to find out and describe the feasibility of coffee farming at the level of farmers who cultivate coffee beans and at the level of home industries in South Konawe Regency which produce packaged ground coffee. The parameters used to assess the financial feasibility of coffee farming are by calculating the value of Revenue Cost Ratio (R/C), Net Present Value (NPV) and Net Benefit Cost Ratio (NBCR) at interest rates of 12% and 35% of farming and ground coffee processing businesses. Based on the R/C ratio, a value of 16 is obtained, this shows the benefits of coffee farming, where every USD 65.59 invested in coffee farming will generate 16 times the income. The NPV value of coffee farming has a value of USD 2,370; supported by an NBCR value of 2.04, and the ground coffee processing business by coffee industry obtained an NPV of USD 5,052; and also an NBCR value of 1.12, meaning that smallholder coffee farming in South Konawe Regency is financially profitable and feasible to develop.

Keywords: Agroindustry, coffee, farming, Southeast Sulawesi

INTRODUCTION

Coffee is a flagship commodity in South Konawe Regency. The coffee commodity in South Konawe has been fairly well commercialized. However, this commercialization process needs to be supported by a robust upstream sector. The productivity of coffee plantations in South Konawe is still relatively low at 310 kg ha⁻¹ compared to the national coffee productivity of 832 kg

ha⁻¹ (Ditjenbun, 2022), while the expected potential productivity for coffee is between 2000 kg and 3000 kg ha⁻¹. This low productivity can potentially hinder the planned commercialization of the flagship agricultural commodity, coffee. Currently, South Konawe has implemented an expansion program in several areas, which could serve as excellent potential for the development of the coffee industry in South Konawe (Distan PHP, 2022).

South Konawe Regency is the largest area in Southeast Sulawesi Province and has the highest contribution from the agriculture and plantation sectors to productive activities supporting the local economy. (BPS Sultra, 2021). The leading agricultural commodities in South Konawe Regency consist of several types, such as coffee, coconut, pepper, and patchouli. Among these various flagship commodities, only coffee has undergone a successful downstream process by the farmers. In general, coffee plantations in Southeast Sulawesi are smallholder plantations covering an area of 8,615 ha with a coffee production rate of 2,796 tons year⁻¹ (Ditjenbun, 2021). In 2021, South Konawe ranked as the third-largest region in terms of both the plantation area and coffee production (1,340 ha; 319 tons) in Southeast Sulawesi, following East Kolaka Regency (1,962 ha; 401 tons) and Bombana Regency (1,369 ha; 835 tons) (BPS Sultra, 2022a ; 2022b). Regarding the processing of ground coffee in South Konawe, the coffee industry utilizes 2000 kg of coffee beans per processing cycle, yielding 1500 kg of ground coffee. The calculation is based on Robusta coffee. Additionally, the industry operates only twice a year, resulting in a total annual production of 3000 kg of ground coffee. All these activities at the farmer and industry levels in South Konawe are fully supported by the local government. This is based on the support from the South Konawe Regency Local Government, such as providing special fertilizer assistance to coffee farmers and even assistance for the innovation of packaged ground coffee products for household industry players. They have also allocated a budget for the registration of the geographical indication of the coffee products by the South Konawe Regency Local Government (Distan PHP, 2022).

Referring to the potential availability of land and coffee production supported by the Regional Government in an effort to develop

‘Devisa Village’ through coffee processing products, it is necessary to examine whether efforts to improve the local economy through coffee farming have a positive or negative impact. Several studies in other regions have shown that Arabica coffee farming (Zakaria, 2019) and Robusta coffee farming (Parimpasa & Yuliawati, 2022) are suitable for sustainable development and investment. Therefore, the objective of this research is to determine and describe the feasibility of coffee farming at the farmer level, which cultivates coffee beans, and at the household industry level in South Konawe Regency, which produces packaged ground coffee.

MATERIALS AND METHODS

This research was conducted in South Konawe Regency, Southeast Sulawesi Province, Indonesia. The data used in this study consisted of primary and secondary data. Primary data were obtained through direct observation, questionnaire surveys, and interviews with coffee farmers. The collected primary data included the type of commodities, types and quantities of inputs used, commodity input prices, the number of laborers, and the unit prices of products from both coffee plantations and processing industries in South Konawe. Secondary data were obtained from relevant institutions, namely the Central Statistics Agency (Badan Pusat Statistik/BPS), the Department of Food Crops, Horticulture, and Plantation, and Bank Indonesia. The required secondary data for this research included the Bank Indonesia interest rate and the regional conditions. The research locations were purposely selected in three districts (Landono, Benua, and Mowila) as they are key areas for coffee development identified by the local government. The determination of the number of respondents was carried out through: (1) Quota sampling used to determine the number of coffee farmer

respondents, with 20 individuals from Landono, 20 from Benua, and 20 from Mowila. Thus, the total number of respondents was 60 individuals. (2) Informants from coffee processing industries were purposely selected. The data were analyzed using both qualitative and quantitative data analysis methods. The parameter used to assess financial feasibility is the Revenue Cost Ratio (R/C), calculated with the following formula:

$$R/C = \frac{\sum Y \cdot P_{yi}}{\sum X \cdot P_{xi}} \dots\dots\dots (1)$$

Description :

R : Revenue (USD)

C : Cost (USD)

Y : Total products (USD)

X_i : Factor of production to -i (unit)

P_{xi} : The price per unit of production factor to -i (USD/Unit)

P_{yi} : The price per unit of production (USD/unit)

If R > 1, it means the related business is profitable

If R < 1, it means the business incurred losses

If R = 1, it means break event

To determine the financial viability level for a specific commodity, financial analysis can be conducted based on the calculations of Net Present Value (NPV) and Net Benefit Cost Ratio (NBCR). In the investment criteria, a Discount Factor (DF) of 12% and 35% is used because the prevailing bank interest rate at the time of the research was 12%. NPV and NBCR are calculated based on the following formulas:

$$NPV = \sum_{t=0}^n \frac{(Bt - Ct)}{(1+i)^t} \text{ OR } NPV = (NB)/((DF) \dots\dots (2)$$

$$NBCR = \frac{\sum_{t=1}^n \frac{Bt - Ct}{(1-i)^t}}{\sum_{t=1}^n \frac{Bt - Ct}{(1-i)^t}} \text{ OR } NBCR = \frac{NPV +}{NPV -} \dots\dots\dots (3)$$

Description :

Bt : Total revenue in year to -t (IDR)

Ct : Total cost in year to -t (IDR)

t : Year to 1, 2, 3, , n

n : Business age (year)

i : Discount rate (%)

The decision criteria is:

- if NPV > 0, farming coffee is feasible;
- if NPV = 0, farming coffee is in break event state;
- if NPV < 0, farming coffee is not feasible;
- if Net B/C > 1, coffee farming in South Konawe Regency is financially viable to continue;
- if Net B/C < 1, coffee farming in South Konawe Regency is not financially viable to continue.

RE-SULTS AND DISCUSSIONS

Characteristics of Coffee Plantation in South Konawe

The South Konawe government, specifically the Food Crops, Horticulture, and Plantations Services, aims to ensure the sustainability of downstream coffee commodities in Devisa Village. To achieve this, stakeholders have established the division of zones (clusters) based on their comparative and competitive advantages, namely (a) the main area, (b) the flagship/connecting area, and (c) the development area (Distan PHP, 2022).

Coffee farmers in South Konawe Regency are spread across several districts. The coffee farmers who participated in this study are from the districts of Landono, Benua, and Mowila, all of which are primary areas for the development of coffee commodity products in South Konawe Regency (Distan PHP, 2022). The number of farmers who participated in this research was 60. The majority of coffee farmers predominantly cultivate Robusta coffee because this coffee type offers advantages in terms of higher production compared to Arabica and Liberica coffee varieties. The extent of coffee cultivation in each district can be seen in Table 1.

Table 1. Distribution of coffee area in South Konawe Regency

District	Village	Land area (ha)
Benua	Punggawukawu	112
	Tetehaka	11
	Benua Utama	8.5
Angata	Sandarsih	25
	Matabondu	24
Laonti	Ulusawa	11
Landon	Abenggi	11
Tinanggea	Tolutu Jaya	10
Sabulakoa	Tetenggabo	10
Mowila	Lamolori	25
Andoolo	Ataku	6
	Mataupe	12
Total		265.5

Source: Distan PHP (2022).

Based on the field observations of the respondents, on average, coffee farmers typically own land with an area of 3 hectares, thus being categorized as large-scale land. The number of coffee trees planted is 1,600 trees ha⁻¹, resulting in a total of 4,800 cultivated trees. This indicates that farmers have significant ability or motivation in coffee farming.

Cost and Revenues

Farming costs are divided into total fixed costs and total variable costs. Fixed costs are expenses that do not affect production volume. Fixed costs in coffee farming consist of depreciation expenses and land rent. Then, fixed costs in coffee beans processing consist of rent, depreciation, and taxes. On the other hand, variable costs are all non-fixed costs that are linearly related to the output of coffee products. Variable costs in coffee farming consist of labor wages, cost of transportation, and cost of compost. Then, variable costs in coffee beans processing consist of packaging costs, labor wages, firewood, and fuel costs. A description of the cost items can be seen in Table 2.

The total annual cost of coffee farming amounts to USD 345.81 yr⁻¹ ha⁻¹. When categorized by expense type, the fixed costs

amount to USD 199.55 yr⁻¹ ha⁻¹, while the variable costs amount to USD 146.26 yr⁻¹ ha⁻¹. Fixed costs in coffee farming include equipment depreciation and land rental, while variable costs encompass labor for maintenance and harvesting tasks as well as transportation costs for compost fertilizer.

Then, for the powdered coffee processing business, the variable cost amounted to USD 4,858.66 per ton, which is higher compared to the fixed cost for the 2 to 20 years projection. The fixed costs for the powdered coffee processing business include rental costs (USD 1,967.60), depreciation costs (USD 103.14), and taxes (USD 6.56). The total fixed costs budgeted are lower than the findings of the study by Fatmawati *et al.* (2018) in the production of ginger coffee, amounting to USD 5,748.82. This is because the ginger coffee industry includes factory overhead costs (USD 3,828.02), which encompass various expenses such as administrative and managerial salaries, equipment maintenance costs, building expenses, as well as electricity and telephone charges. Meanwhile, the variable costs include raw material (USD 2,098.77) packaging (USD 1,049.39), labor wages (USD 1,574.08), firewood (USD 131.17), and liquefied petroleum gas (USD 5.25). According to Kusmiati & Wati (2020), fixed

costs in tax payments will vary in the future due to the fluctuating prices of coffee each year. Furthermore, the determination of selling prices is also based on calculations made by the business owner, taking into account the invested capital (Prismanda *et al.*, 2023). Therefore, it is necessary to monitor the fluctuations in coffee prices in the market.

The main factors influencing the level of acceptance in coffee farming are the quantity of output or production and its selling price (Christina *et al.*, 2016). Furthermore, income is the difference between revenue and the total expenses incurred by farmers. Based on the total revenue from the coffee farming, farmers receive USD 5,391.22 yr⁻¹ with expenses of USD 345.81 per year. Therefore, the income obtained is USD 5,045 per year, or USD 420 per month as shown in Table 3.

From this perspective, it is evident that the development of coffee farming has significant potential as it can provide high welfare for farmers. While compared to the South Konawe regional minimum wage in 2021, which was only USD 167.38 per month, income from coffee farming amounts to USD 420.45 per month. Thus, the income from coffee farming is nearly three times the minimum district wage.

Based on the R/C ratio, a value of 16 is obtained, indicating the advantage of coffee farming, where every USD 65.59 invested

in coffee farming will yield an income of USD 1,049.39, as seen in Table 3. This is further supported by the findings of Megayani (2019), which show that coffee plants in the age of < 5 to > 25 years all provide profit in coffee farming within the range of R/C 1.35 to 1.98. This indicates that the age of coffee plants is not a factor causing losses in coffee farming.

In addition to considering the R/C ratio to assess financial feasibility, it is also important to look at the NPV and NBCR criteria. Table 4 displays the results of NPV and NBCR calculations for coffee farming per hectare in South Konawe Regency with interest rates of 12% and 35%, respectively. Based on these results, the NPV has a value of USD 2,370.37, supported by an NBCR value of 2.04, indicating that small-scale coffee farming in South Konawe Regency is financially profitable and worthy of development.

However, it should be noted that the NPV turns negative when the interest rate reaches 35% (USD 30.74), which means that coffee farming in South Konawe Regency remains feasible until the interest rate reaches 34%. Liana *et al.* (2022) strengthens this argument that both types of Arabica and Robusta coffee farming in Way Ratai District are profitable and viable, meeting all the analysis criteria, with Arabica coffee farming being more financially advantageous.

In South Konawe Regency, coffee commodities are not only traded in the form of beans,

Table 2. Operational costs of coffee farming and coffee beans processing at South Konawe Regency

Type of cost	Coffee farming (USD yr ⁻¹ ha ⁻¹)	Coffee beans processing (USD ton ⁻¹)
Fixed cost	199.6	2,077
Variable cost	146.3	4,859
Total	345.8	6,936

Source: Primary data analysis (convert IDR to USD according to exchange rate on Sep 2022).

Table 3. The net income of coffee farming in South Konawe Regency in 2022

Revenue (USD yr ⁻¹)	Cost (USD yr ⁻¹)	Net income (USD yr ⁻¹)	Net Income (USD month ⁻¹)	R/C
5,391.22	346	5,045	420	16

Source: Primary data analysis (convert IDR to USD according to exchange rate on Sep 2022).

Table 4. Comparison of NPV and NBCR feasibility analysis for coffee farming and coffee powder processing businesses in South Konawe in 2022

Description	Coffee farming (USD yr ⁻¹ ha ⁻¹)	Ground coffee processing (USD ton ⁻¹)
Total value benefit df 12%	4,820.21	48,989.60
Total value cost df 12%	2,449.84	43,937.07
NPV +	2,370.37	5,052.52
Total value benefit df 35%	871.63	11,306.84
Total value cost df 35%	902.36	11,323.20
NPV –	(30.74)	(16.36)
Total NPV	2,339.64	5,036.16
NBCR	2.04	1.12

Source: Primary data analysis (convert IDR to USD according to exchange rate on Sep 2022).

which are the result of coffee farming efforts, but there are also coffee farmers who engage in further processing to produce ground coffee. Table 4 shows the results of NPV and NBCR calculations for coffee farming per hectare in South Konawe Regency with interest rates of 12% and 35%, respectively. Based on these results, the NPV results obtained align with other studies that obtained positive NPV values in coffee processing (Surya *et al.*, 2016; Murbaningtyas *et al.*, 2020). The NPV has a value of USD 5,052.52, indicating that this investment is feasible and profitable.

This is supported by an NBCR value of 1.12, which means that financially, the ground coffee processing business in South Konawe Regency is worth pursuing. These findings are consistent with a study conducted by Oka *et al.* (2021) regarding the feasibility analysis of the ground coffee agroindustry in Nogosari Village, Rambipuji District, Jember Regency. The study states that the ground coffee agroindustry is also feasible to run with an interest rate of 9%, with an NPV of USD 18,272.66 and an NBCR value of 2.44.

Therefore, to enhance the sustainability and competitiveness of this coffee processing business, it is necessary for farmers, entrepreneurs, local government, and educational institutions to collaborate and work together in the development of the coffee agribusiness in South Konawe Regency. The local government needs to promptly register the Geographical Indication of coffee product as the intellectual

property of South Konawe Regency. This way, the South Konawe Regency government won't hesitate when providing assistance to MSMEs. The coffee processing business needs to collaborate with retail companies for the distribution and marketing of their products.

CONCLUSIONS

Business of coffee beans in South Konawe is feasible. This is supported by the results of the financial feasibility analysis, which showed an R/C of 16 and an NPV of USD 2,370.37, as well as an NBCR value of 2.04. Ground coffee processing business is also suitable for development with an NPV of USD 5,052.52 and an NBCR value of 1.12.

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