

**DISTRIBUTION PATTERNS OF THE SUPPLY CHAIN AND VALUE ADDITION OF
COFFEE AGRIBUSINESS IN KADUAJA VILLAGE, GANDANGBATU SILLANAN
DISTRICT, TANA TORAJA REGENCY**

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Abstract

This research aims to determine the flow pattern of the coffee agribusiness supply chain and calculate the added value of the coffee agroindustry in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency. The research location was determined purposively, with respondents consisting of 9 coffee farmers, 3 coffee fruit collectors, 1 large-scale coffee fruit trader, and 7 coffee consumers, totaling 20 samples. The results of this study indicate that 1) there are five patterns of the coffee supply chain flow in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency, where this mechanism has three flows: first, the product flow moves from upstream to downstream, namely from farmers-collecting traders-Bunga Seong Coffee (processor)-consumers. Second, the flow of money moves from downstream to upstream, that is, from consumers to Bunga Seong Coffee (processor), then to collecting traders, and finally to the farmers. Third, the flow of information that occurs between members of the supply chain is the price, flowing from Bunga Seong Coffee (processor) to the collecting traders and then to the farmers. 2) The added value of the coffee agroindustry reaches 22.00% of the output value. The contribution of income obtained by the labor involved in the coffee agroindustry is 4.16%, with labor income reaching Rp.10,000/kg. The profit margin of the coffee agroindustry is 95.833%, meaning that every 1.5 kg of coffee raw material can provide an added value of Rp.240,000/kg.

Keywords: Flow Patterns, Supply Chain, Agroindustry, Added Value.

INTRODUCTION

In the contemporary era, the coffee industry in Indonesia has experienced rapid development with an increasing number of innovations in the processing and marketing of coffee products. Indonesia has become one of the largest coffee producers in the world, ranking fourth after Brazil, Colombia, and Vietnam (Panggabean, 2011). This indicates that the coffee sector plays a strategic role in the national economy, both in the context of exports and domestic consumption.

The coffee supply chain pattern in Indonesia is quite complex, involving various actors such as farmers, collectors, retailers, and exporters. The study conducted by Noer & Handayani (2023) shows that the coffee bean supply chain network in Indonesia still faces several challenges, including in the aspects of distribution efficiency and the added value obtained at each stage. For example, the research by Fitriani et al. (2021) found that the distribution of coffee from farmers to consumers can go through several channels, both directly and through intermediaries, which affects the final product price.

One of the premier coffee-producing regions in Indonesia is Tana Toraja Regency, South Sulawesi. Coffee from this region is famous for its distinctive flavor and has been internationally recognized. Research by Gabryaldo et al. (2022) revealed that Tana Toraja Arabica coffee has a relatively high added value in its supply chain. However, previous research has shown limitations in the effectiveness of the coffee supply chain in this area, particularly in the optimization of added value and distribution management.

This research aims to identify the distribution patterns of the coffee supply chain in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency, and to analyze the added value generated in the process. The method used in this research is the Hayami Method, which has proven effective in measuring the added value of agribusiness products (Hayami, 2019).

The results of this research are expected to provide strategic recommendations for coffee industry players, both at the farmer and distributor levels, to enhance the efficiency and competitiveness of coffee products in both local and international markets.

RESEARCH METHOD

This research uses a descriptive approach with qualitative and quantitative methods. The qualitative approach was conducted through direct surveys with respondents using structured interviews, while the quantitative approach was carried out using the Hayami method to calculate the added value of coffee. The Hayami method is widely used in agribusiness research, including in the analysis of value-added processed products such as coffee and pineapple (Fitriani, Sutarni, & Bina Unteawati, 2021; Hayami, 2019). This research was conducted in September–October 2024 in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency. The selection of the research location was conducted purposively because this area has the largest contribution to coffee production in Tana Toraja Regency (Arikunto, 2012).

The main focus of this research is to identify the coffee supply chain from the farm to the exporter and processing industry, as well as to measure the added value obtained by each actor in the supply chain (Ivanov, Tsipoulaidis, & Schonberger, 2018). The research objects include supply chain elements, supply chain flows, supply chain management, and supply chain structure, while the research subjects consist of coffee farmers, coffee bean collectors, wholesalers (retailers), and consumers such as coffee shops, baristas, and online coffee sellers (Giulia Marcolongo, 2020).

The selection of respondents was conducted using the census and snowball sampling methods. According to Arikunto (2012), this study involves 20 respondents consisting of 9 coffee farmers, 3 collector traders, 1 large trader, and 7 coffee consumers. The census technique was used because the population

of the coffee agroindustry is relatively small, while the snowball technique was used to identify supply chain actors whose exact number is unknown.

The data collection techniques in this study are divided into primary data and secondary data. Primary data were obtained through survey methods using questionnaires and direct interviews with respondents, while secondary data were collected from previous research, scientific journals, government documents, and other relevant literature sources (David Tan, 2021).

Data analysis was conducted using descriptive methods and the Hayami method. Descriptive analysis is used to describe the coffee supply chain system, business actors' activities, and the supply chain structure. Meanwhile, the Hayami method is used to calculate the added value of coffee based on input and output variables, raw material prices, and the labor involved (Romdhon et al., 2021).

RESULT AND DISCUSSION

This section presents the research results on the distribution patterns of the coffee supply chain and the added value of the coffee agroindustry in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency. The analysis was conducted based on data collected from farmers, collecting traders, large traders, and consumers.

1.1.1. Coffee Supply Chain Distribution Patterns

Based on the research findings, there are five patterns of coffee supply chain flow that occur in Kaduaja Village:

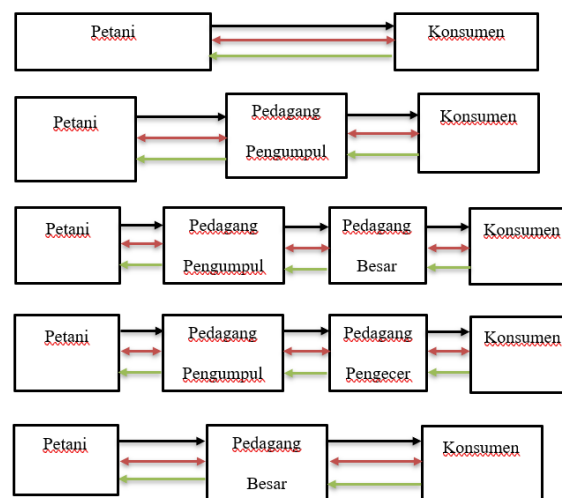


Figure 1. Coffee Supply Chain Distribution Pattern

Flow Description:

-  : Product Flow
-  : Cash Flow
-  : Information Flow

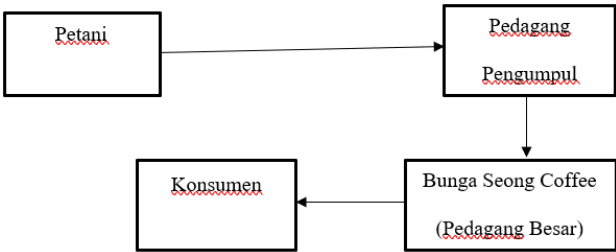
that the coffee supply chain distribution pattern in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency. The first distribution pattern is the product flow, where the shortest distribution pattern involves the process of picking coffee, grinding the still round red or intact coffee, drying the coffee until it is dry, and then the farmers will sell the dried coffee directly to consumers in the form of coffee beans in Kaduaja Village. This process is carried out through three flows, namely the product flow, starting from the farmers who pick, grind, and dry the coffee until it becomes coffee beans, which

are then sold directly to customers or consumers (Agustin, 2018). The flow of money in this pattern is from the consumer directly without any intermediaries because at this stage, it is sold directly in the form of coffee beans. The flow of information, from the customer directly to the farmer with a predetermined price (Perangin-angin, 2024).

In this research, the researchers will describe the research results in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency through 3 flows in the supply chain. The flow of the coffee agribusiness supply chain in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency consists of 3 activities, namely product flow, financial flow, and information flow (Geha Agustinus, Ni Putu Nursiani, 2021). The product flow moves from upstream to downstream. The financial flow moves from consumers to intermediaries/traders and then to coffee farmers. Meanwhile, the flow of information moves from producers/farmers to intermediaries and then to consumers, (Study et al., 2021).

1. Product Flow (Goods)

Figure 2. Product Flow



The flow of the product begins with the farmers, where the farmers plant coffee seeds and take care of the coffee plants until they bear fruit. Then the farmers will carry out the coffee picking process, wet milling, and drying the coffee until it is completely dry (Apriliya, 2020). After the coffee is completely dry, it is then followed by the process of grinding the dry coffee, and the final stage is that the coffee is ready to be sold to collecting traders. From there, these traders will sell it to large traders, namely Bunga Seong coffee (Ratna Ratna et al., 2022).

2. Information Flow

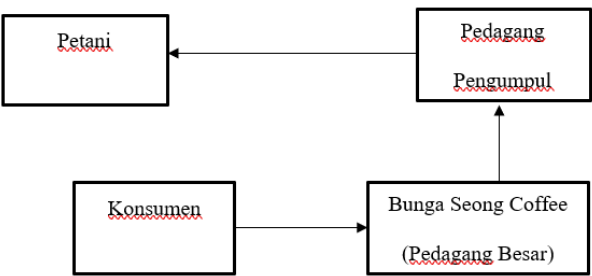


Figure 3. Information Flow

The flow of information that occurs between supply chain members is price. Information about prices occurs among the actors involved in the financial flow (Tompodung et al., 2019). The information flows from Bunga Seong Coffee to the collecting traders and then to the farmers. The government plays a role in the flow of information, especially regarding cultivation (Citra Alam et al., 2021). The flow of information occurs between institutions, such as the flow of information from the government to farmers or vice versa. Farmers inform about the obstacles in the cultivation process, and then the government

will try to help provide solutions to the farmers (Wijaksana & Pramulya, 2024).

3. Cash Flow

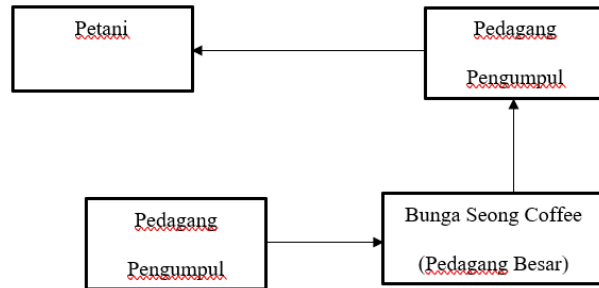


Figure 4. Cash Flow

The flow of finance begins with consumers who channel their money to Bunga Seong Coffee. Then Bunga Seong Coffee channels its money to the collecting traders, who are one of the suppliers of coffee beans to the company. The collecting traders will channel their money to coffee suppliers, such as village collectors, all the way to the coffee farmers. The collecting traders will borrow money from the bank if they experience an increase in coffee supply for their business (Salahudin et al., 2018).

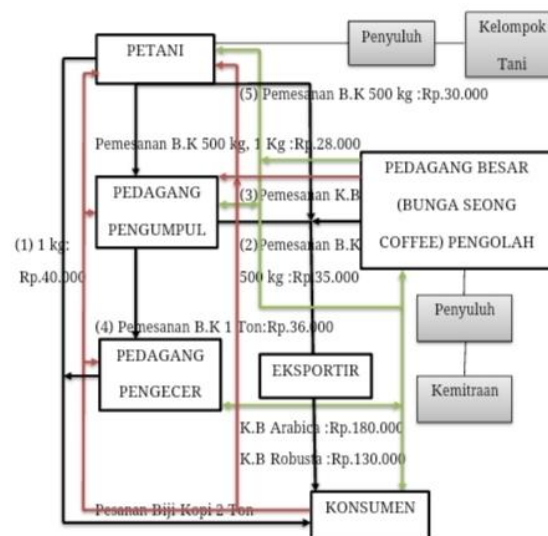


Figure 4. Coffee Distribution Channel

The flow of products moves from upstream to downstream, starting from farmers to the end consumers. The flow of goods at the research site is known as one of the coffee-producing regions of Tojolo, specifically the arabica and robusta coffee varieties. The farmers here are the suppliers of raw materials in the village of Kaduaja, which produces coffee that is then processed starting from coffee picking, grinding the outer skin into coffee beans, then drying them until they are dry, and selling them to collectors, large traders (Bunga Seong Coffee) processors, retailers, and finally to consumers in the village. Farmers sell their harvests, which range from 1-2 tons, directly to consumers. This shows that the sale of farmers' coffee beans is made directly to consumers, where the farmers and consumers have established a strong cooperative bond. Although farmers and consumers or traders do not have a cooperation contract in the form of capital assistance or production facilities, a partnership is formed with

a good bond because farmers often sell coffee beans or their harvests to these consumers. This can be done by farmers because of the presence of agricultural extension workers and farmer groups who play a role in assisting coffee farmers, providing education on efficient cultivation techniques, pest control, and farm management. And through farmer groups that can share information, receive joint training, and improve bargaining positions in product marketing.

1. Analysis of Value Added in the Coffee Agroindustry

To measure the added value of the coffee agroindustry in Kaduaja Village, this study uses the Hayami Method.

Variabel	Nilai (Per Periode)	Nilai (Per Tahun)
I. Output, Input, dan Harga		
1. Output (Kg)	100	1.200
2. Bahan baku (Kg)	150	1.800
3. Tenaga kerja (HOK)	50	600
4. Faktor Konversi	1,5	18
5. Koefisien Tenaga Kerja	0,2	2,4
6. Harga output (Rp/Kg)	180.000	2.160.000
7. Upah rata-rata tenaga kerja (Rp/HOK)	50.000	600.000
II. Pendapatan dan Keuntungan (Rp/Kg)		
8. Harga bahan baku (Rp/Kg)	30.000	360.000
9. Sumbangan input lain (Rp/Kg)	12.000	144.000
10. Nilai output/produk	270.000	3.240.000
11. a. Nilai tambah	240.000	2.880.000
b. Rasio nilai tambah	22,00	264
12. a. Pendapatan/Imbalan tenaga kerja	10.000	120.000
b. Bagian tenaga kerja	4,16	49,92
13. a. Keuntungan	230.000	2.760.000
b. Tingkat keuntungan	95,833	1.149,996
III. Balas Jasa Untuk Faktor Produksi		
14. Margin keuntungan	240.000	407.000
a. Keuntungan	95,83	1.149,96
b. Tenaga kerja	4,16	49,92
c. Input lain	5	60

The analysis results show that the coffee produced by the agro-industrial actor amounts to 40 kg per production period or per day. In the span of 1 year, the business operator is able to produce approximately 40 batches of production, resulting in a total coffee production of 10,000 kg in one year. The raw materials needed for one production cycle amount to 150 kg of coffee beans or the equivalent of 100 kg of ground coffee, so in one year, 1,000 kg of raw materials are required. The processing time required is approximately +9 hours. During the production period of May 30, 2023, the purchase price of raw materials (coffee) by agro-industrial entrepreneurs was Rp 30,000.00 per kg.

The conversion factor is obtained by comparing the average output with the average production input. The conversion factor obtained is 1.5. This conversion factor indicates that every 1.5 kg of processed coffee beans will yield 1 kg of ground coffee. The value of other input contributions in the coffee processing production process is required at Rp 12,000.00/kg.

The labor coefficient is obtained from the comparison of the labor used with the inputs used in the coffee processing process. The labor used in the coffee agro-industry is 50 HOK/year, so the labor coefficient used in processing 1 kg of coffee is 0.2 with a labor wage of Rp 50,000.00/HOK.

The output value of the coffee agroindustry is Rp 270,000.00, obtained by multiplying the conversion factor of 1.5 with the output price of Rp 180,000.00/kg. Meanwhile, the added value obtained by coffee agroindustry actors is Rp. 240,000/kg. This value is obtained by subtracting the output value of Rp. 270,000.00

from the raw material price of Rp. 30,000.00/kg and other input contributions of Rp. 12,000.00/kg. The value-added ratio of the coffee agroindustry is 22.00% of the output value. The labor income is Rp 10,000/kg of coffee produced. The labor income is obtained by multiplying the labor coefficient of 0.2 with the labor wage of Rp 50,000/HOK, resulting in a labor share of 4.16%, which is obtained by dividing the labor income of Rp 10,000 by the added value of Rp 240,000 and then multiplying the result by 100. The profit obtained in the coffee agroindustry is Rp 230,000.00/kg of coffee produced. This value is obtained from the reduction of added value of Rp.240,000.00/kg against labor income of Rp. 10,000.00/kg. The profit margin of the powdered coffee agroindustry players is 95.833%. This profit margin is obtained by dividing the profit of Rp.230,000.00/kg by the added value of Rp.240,000.00/kg and then multiplying by 100%. This means that every 1.5 kg of coffee raw material can provide an added value of Rp. 240,000.00/kg. This is in accordance with the research that the pineapple agroindustry into pineapple dodol can provide an added value of 63.98 (Fitriani 2014). This means that every 1 kg of pineapple raw material can provide an added value of Rp. 39,989.29 when processed into pineapple dodol (Hanum and Sinarasri, 2018). Another study on the pineapple agroindustry processed into other products (pineapple chips) also provides profits for entrepreneurs, and the financial feasibility analysis and research results also indicate that this business is worth developing.

Agroindustry is a series of business activities aimed at increasing the added value of agricultural products by chemically or physically transforming them (Asrol et al., 2020; Fitriani et al., 2021; Fitriani et al., 2021). Agroindustry consists of upstream and downstream stakeholders that enable the production of high-value products. This is in line with the research on the jackfruit chip agroindustry in Pesawaran Regency, which has an added value of 2.16% (Fafrina et al., 2021).

Compensation for the Owner The production factor of the coffee agroindustry is the margin obtained from the reduction of output value with the raw material price. The margin value obtained by coffee processing entrepreneurs is Rp. 240,000.00/kg of ground coffee. The value of labor income compensation obtained is 4.16%, which is obtained by dividing the labor income of Rp.10,000 by the profit margin of Rp.240,000 and then multiplying the result by 100. The value of the contribution of other inputs obtained is 5%, which is obtained by dividing the contribution of other inputs amounting to Rp.12,000 by the profit margin of Rp.240,000 and then multiplying the result by 100. Meanwhile, the value of the entrepreneur's profit share is 95.83%, obtained by dividing the profit of Rp.230,000 by the profit margin of Rp.240,000 and then multiplying the result by 100.

2. Comparison with Previous Research

The results of this study are in line with the research conducted by Fitriani et al. (2021) on the pineapple agro-industry supply chain, which shows that an indirect distribution pattern has advantages in expanding the marketing network and increasing product price competitiveness (Sosial et al., 2019).

This research also supports the findings of Khairunnisa Noviantar (2015), who found that the supply chain of civet coffee agroindustry in Lampung Province has a distribution pattern similar to a multi-level system, where large traders play a central role in processing and distributing coffee to consumers (Desa et al., 2024).

3. Implications for Coffee Supply Chain Development

Based on the findings of this study, there are several recommendations that can be implemented to improve the efficiency of the coffee supply chain in Kaduaja Village: 1). Increasing Farmer Involvement in the Downstream Process: Farmers can be encouraged not only to sell raw coffee beans but also to engage in the processing process to obtain higher added value (Nasution, 2019). 2) Improving Market Access through Cooperatives: The formation of cooperatives can help farmers gain broader market access, both domestically and for export (Ikhlas et al., 2023). 3) Application of Technology in the Supply Chain: The digitalization of the supply chain through the use of e-commerce platforms and price monitoring systems can help farmers obtain

more competitive selling prices (Rachmawati & Gunawan, 2020).

CONCLUSION

This research identifies the distribution patterns of the coffee supply chain in Kaduaja Village, Gandangbatu Sillanan District, Tana Toraja Regency. There are five main patterns in the supply chain, starting from farmers selling directly to consumers to various intermediaries such as collectors and retailers before reaching the end consumers. This distribution mechanism involves three main flows: the flow of products from farmers to traders and consumers, the flow of price information moving from collectors to farmers, and the flow of finances moving from consumers back to farmers. In addition, this study shows that the added value of the coffee agroindustry reaches 22%, with a labor income contribution of 4.16% and a profit margin of 95.83%. Thus, the coffee agroindustry in this region has significant economic potential for farmers and related entrepreneurs.

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