Marketing Efficiency of Cassava in Tulang Bawang Barat Lampung Province

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Abstract

Purpose: This study examines cassava marketing channels and their efficiency in Lampung Province, Indonesia. Lampung was selected purposively because it is Indonesia's largest cassava-producing province.

Research Methodology: The research was conducted from October 2020 to July 2021 using a survey approach at cassava production centers across Lampung. The respondents consisted of 100 cassava farmers selected through simple random sampling, while lapak (collectors) and agents were identified using snowball sampling. Marketing channels were mapped using a qualitative descriptive analysis. Marketing performance and efficiency were evaluated using marketing margin analysis, farmer share, and the Profit Margin Ratio (RPM).

Results: The study identified multiple marketing channels, with the longest being the Farmer–Lapak–Agent–Factory channel. Overall, the cassava marketing system in Lampung was found to be inefficient, as indicated by relatively high marketing margins, low farmer share, and uneven profit margin ratios across marketing actors.

Conclusions: Cassava marketing in Lampung is dominated by long distribution chains that reduce farmers' benefits and create unequal profit distribution. Improving efficiency requires shortening marketing channels and strengthening farmers' market access to increase the farmer's share and reduce excessive margins.

Limitations: The findings are based on survey data from selected cassava production centers during 2020–2021 and may not fully capture seasonal price dynamics, contract arrangements, or variations across other provinces.

Contributions: This study provides empirical evidence on cassava marketing channel structures and efficiency indicators in Indonesia's main production region, offering practical insights for designing interventions to reduce margins, improve farmer share, and promote a more balanced profit distribution among supply chain actors.

Keywords: *Cassava, Efficiency, Lampung Province, Marketing*

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1. Introduction

Cassava is an important commodity for food security and as a provider of raw materials for industry (Mtunguja, Beckles, Laswai, Ndunguru, & Sinha, 2019); (Onoja, 2019); (Zakaria, Endaryanto, Indah, Sari, & Mutolib, 2020). Indonesia ranks sixth among the world's cassava-producing countries, after Nigeria, Thailand, the Democratic Republic of the Congo, Ghana, and Brazil (Nurainy, 2020). Lampung

Province is one of the largest cassava-producing regions in Indonesia. According to the Central Statistics Agency of Lampung Province (BPS, 2020), cassava productivity in Lampung Province exceeds the national average in Indonesia. However, there has been a decline in cassava production and harvested area over the past five years (2016–2020). This decline is caused by fluctuating cassava prices, which tend to decrease and remain low (Pratiwi, Haryono, & Abidin, 2020).

According to the BPS (2020), at the national level, the average producer price of cassava has increased every year; however, in Lampung Province, it decreased from IDR 1,402/kg in 2018 to IDR 1,177/kg in 2019. Low cassava prices and productivity, combined with high production costs due to increasing prices of production inputs, labor wages, and land rental, have resulted in low, even negative, cassava farming income and inefficiency Anggraesi, Ismono, and Situmorang (2020); Fitriana, Zakaria, and Kasymir (2019); Sari, Ismono, and Adawiyah (2020).These problems require more intensive handling of cassava farmers in Lampung Province because, if they are not properly addressed, farmers' motivation to continue cassava farming will decrease (Anggraesi et al. (2020); Indah, Zakaria, and Prasmatiwi Erry (2015); Pratiwi et al. (2020).

An imperfectly competitive market structure and inefficient marketing system have caused a decline in cassava prices. Farmers' bargaining position in cassava transactions is very weak compared to that of traders and factories. Farmers act only as price takers and cannot determine the selling price of cassava (Kusumah, 2018). The price received by farmers is determined by factories through agents or collectors (lapaks). Low cassava prices affect farmers' share, making marketing channels inefficient. Consequently, high marketing margins are not proportional to the profits obtained. High marketing costs cause marketing institutions to earn low profits, even when marketing margins are high (Hadi & Hani, 2020).

Several studies related to marketing efficiency have been conducted by Alang and Suwarsinah (2013), Nabay et al. (2018), and Rahman and Awerije (2014). Rahman and Awerije (2014) showed that increases in cassava purchase prices and marketing costs significantly reduce marketing margins. Cassava marketing efficiency was very low (55%), indicating that marketing margins could be substantially improved by eliminating inefficiencies arising from improper resource allocation, price response, and the scale of operation. Osman (2018) found that the cassava marketing margin was 69% and the profit ratio was greater than one, indicating that the marketing system was profitable and feasible.

Alang and Suwarsinah (2013) showed that the most efficient cassava marketing channel margin was IDR 917, with a farmer's share of 85.89% and a benefit–cost ratio of 7.06%. Considering these conditions, direct marketing to factories without intermediaries is recommended to reduce the costs incurred by farmers (Apriyani, Jayanti, & Nearti, 2025). Longer marketing channels lead to inefficiency in cassava marketing because farmers incur higher costs in their farming activities, which ultimately affects their profit. Therefore, a study on the "Analysis of Marketing Efficiency of Cassava Farming in West Tulang Bawang Regency, Lampung Province" is necessary.

2. Literature Review and Hypothesis Development
2.1 Cassava Marketing Channels
Marketing channels describe the flow of agricultural products from producers to final consumers through various institutions. In cassava agribusiness, marketing channels commonly involve farmers, collectors (lapak), agents, and processing factories. The length of the marketing channel influences marketing costs, price transmission, and farmers' bargaining position. Previous studies indicate that longer marketing channels tend to increase marketing costs and reduce the share of prices received by farmers, leading to lower marketing efficiency (Alang & Suwarsinah, 2013; Rahman & Awerije, 2014; Nabay et al., 2018).

2.2 Marketing Efficiency
Marketing efficiency reflects the ability of a marketing system to deliver products at a minimum cost while ensuring fair profit distribution among marketing actors. Common indicators of marketing

efficiency include marketing margins, farmer's share, and the Profit Margin Ratio (RPM). A marketing system is considered inefficient when marketing margins are high, the farmer's share is low, and profit distribution among institutions is uneven. Several empirical studies on cassava marketing report that inefficiency is often caused by long distribution chains, high transportation costs, and weak market access for farmers Hadi and Hani (2020); Faot, Sirma, and Nainiti (2019); Muklisin, Rochdiani, and Setia (2021).

2.3 Farmer's Share and Profit Margin Ratio
Farmers' share measures the proportion of the final consumer price received by farmers. A higher farmer's share generally indicates better marketing performance, although it does not always guarantee overall efficiency if marketing institutions experience an unequal profit distribution. The Profit Margin Ratio (RPM) is used to assess the fairness of profit allocation relative to marketing costs across institutions. A relatively even RPM across marketing actors indicates a more efficient marketing system (Asmarantaka, Atmakusuma, Muflikh, & Rosiana, 2017).

2.4 Hypothesis Development
Based on marketing efficiency theory and previous empirical findings, the structure and length of marketing channels are expected to influence the marketing efficiency outcomes in cassava agribusiness.

> *H₁:* Longer cassava marketing channels are associated with higher marketing margins and lower farmers' share.
>
> *H₂:* Shorter cassava marketing channels result in higher farmer share and better marketing efficiency.
>
> *H₃:* Uneven Profit Margin Ratios across marketing institutions indicate inefficiency in the cassava marketing system.

3. Research Methodology
This study employed a survey method by collecting data from a group of respondents through a set of structured survey questions. The selected study area was the cassava production centers in West Tulang Bawang Regency, Lampung Province (BPS, 2020). The study was conducted between October 2020 and July 2021. Sampling of farmer respondents was carried out using simple random sampling (Rouf, Retnawati, Rohmadi, Munawaroh, & Hipi, 2021). Traders, collectors (lapak), and agent samples were selected using the snowball sampling method (Leksono, Mustafa, Gama, Afandhi, & Zairina, 2021). Interviews with respondents representing marketing institutions were conducted based on the cassava marketing flow in the study area.

Farmers' share represents the proportion of revenue received by cassava producers, calculated by comparing the price received by farmers with the price paid by final consumers (cassava processing factories), and is used as an indicator of the effectiveness of the cassava marketing system (Azis & Husin, 2021). Efficiency comparisons among marketing channels were analyzed using marketing margin and farmer's share analyses (Suhaeni & Andayani, 2020).

The marketing margin was calculated using the following formula:

$$Mj_i = Ps_i - Pb_i \qquad \text{or} \qquad (1)$$
$$Mj_i = bt_i - \pi_i \qquad \text{or} \qquad (2)$$
$$\pi_i = bt_i - Mj_i \qquad (3)$$

Where:
Mj_i = Marketing margin at the i-th marketing level
Ps_i = Selling price at the i-th marketing institution
Pb_i = Purchasing price at the i-th marketing institution
bt_i = Marketing cost at the i-th marketing institution
π_i = Profit at the i-th marketing institution

The distribution of marketing profits was observed based on the percentage of profit over marketing costs, known as the Profit Margin Ratio (RPM). RPM was calculated for each marketing institution using the following formula:

$$RPM = \frac{\pi_i}{bt_i} \qquad (4)$$

Where:

bt_i = Marketing cost at the i-th marketing institution

π_i = Profit at the i-th marketing institution

An efficient marketing system is indicated by relatively even RPM values across different marketing levels (Faot et al. (2019); Muklisin et al. (2021). Farmer's share is used to determine the proportion of the price received by farmers relative to the consumer-level price, and is expressed as a percentage. The farmer's share Fahrial (2021) is formulated as follows:

$$Fs = Pf / Pr \; X \; 100 \% \qquad (5)$$

Where:

Fs = farmer's share

Pf = price at the producer/farmer level (IDR/kg)

Pr = price at the consumer level (IDR/kg) (Asmarantaka et al., 2017)

4. Results and Discussions

4.1 Respondent Characteristics

This study involved 100 cassava farmers with 144 plots. Most of the respondent farmers were in the productive age group of 15–49 years (65%). More than 60 percent of the farmers had elementary and junior high school education levels, indicating that farmers' education remains relatively low, which may affect their technology adoption. The average number of household dependents was four persons, which influences household expenditure levels for both food and non-food needs (Nurhaedah, Irmayani, Ruslang, & Jumrah, 2023). Expenditures tend to increase as the number of dependents increases, resulting in higher household needs.

The average farming experience of the cassava farmers in West Tulang Bawang Regency was 16 years. Longer farming experience contributes to greater knowledge and skills in farm management, enabling farmers to improve profits and achieve better cassava production outcomes (Nurhaedah et al. 2023). The average cassava farm size in West Tulang Bawang Regency was 1.50 ha per plot, with the smallest land size of 0.06 ha and the largest of 10.00 ha. Limited cultivated land affects production levels, resulting in low farmer income that is insufficient to meet daily needs (Zakaria, Endaryanto, Indah, & Mutolib, 2020).

In addition, most of the respondent farmers owned their land, accounting for 91.67 percent. Land-owning farmers are more advantaged because they do not need to incur land rental costs or share farming outputs (Meirisa, Arafah, & Rakhmat, 2024). This study was conducted in two subdistricts, namely Tulang Bawang Tengah and Tulang Bawang Udik, in the West Tulang Bawang Regency. Cassava farmers in the Tulang Bawang Tengah Subdistrict, particularly in Penumangan Village, cultivate cassava on two types of land: dry and nyapah (swamp) land. Nyapah land is tidal land located near river flows. This condition results in differences in the farming practices applied to each land type.

4.2 Marketing Channels and Marketing Efficiency of Cassava in West Tulang Bawang Regency

Marketing channels are pathways through which agricultural products move from producers (farms) to the final users. Marketing channels consist of various marketing institutions and supporting agents. Marketing costs increase with the length of marketing channels because marketing actors seek to obtain profits from these activities (Daryanto, 2020). Moreover, marketing efficiency is influenced by the length of the marketing channels (Hadi & Hani, 2020). According to Safitri, Putri, and Lestari (2024),

consumer prices tend to be lower in marketing channels involving fewer marketing actors, making these channels more efficient because of lower incurred costs.

High price volatility is a central issue in cassava marketing. The three main actors in the marketing channel are farmers as producers, factories, and the final consumers. Unfavorable conditions affect the marketing efficiency. Marketing efficiency is crucial because it influences market competitiveness and ultimately affects the prices of processed cassava products (Adha, Pranoto, & Purwasih, 2019). Cassava farmers in West Tulang Bawang Regency cultivate cassava on two land types: dry (talang) and wet (nyapah) land. Cassava harvested from dry land has a longer harvesting age than that harvested from wet land, resulting in differences in quality and weight.

Transportation services for cassava harvests in this area differ slightly from those at other research locations. In West Tulang Bawang Regency, boat transportation services are used to transport harvests from wetland areas that require crossing rivers (Riadi, Rohmah Nurazizah, Wakano, & Fadilah, 2023). This condition adds to the marketing costs incurred by farmers. The main constraints faced by cassava farmers include poor and costly transportation, inadequate storage facilities, and limited market access and networks. The primary solutions to these constraints are the provision of proper storage facilities, affordable transportation, and improved market access (Nabay et al. 2018).

There are two lapak (collectors) in the Tulang Bawang Tengah Subdistrict of the West Tulang Bawang Regency, located in Penumangan and Karta Rahardja Villages. These lapaks obtain cassava supplies from farmers in the surrounding areas and sell them to the Budi Acid Factory in Penumangan Village and PT BTJ in Karta Village. These lapak also function as agents in the cassava marketing chain. Most cassava sold to processing factories in the Tulang Bawang Tengah Subdistrict passes through agents. Agents receive incentives in the form of Delivery Order (DO) fees of IDR 25/kg.

Agents also receive premiums from factories ranging from IDR 5–10/kg, which are subsequently allocated to the transportation services. Factories provide agents with a DO premium of IDR 25/kg. There are two cassava processing factories operating in the Tulang Bawang Tengah Subdistrict of the West Tulang Bawang Regency. The first is PT HIM (Budi Acid), located in Penumangan Village, and the second is PT Bertindo (BTJ), located in Karta Village. Figures 1 and 2 illustrate the cassava marketing channels in the West Tulang Bawang Regency.
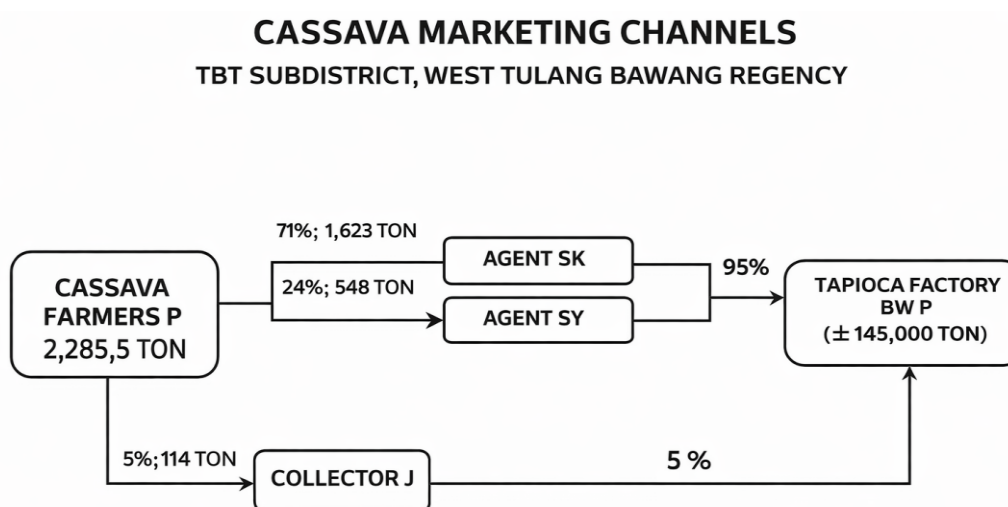

Figure 1. Cassava Marketing Channels in Tulang Bawang Tengah Subdistrict, West Tulang Bawang Regency

CASSAVA MARKETING CHANNELS
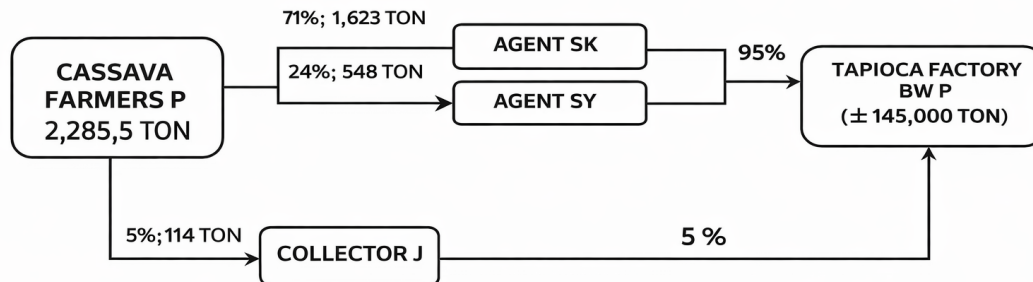## TBT SUBDISTRICT, WEST TULANG BAWANG REGENCY

Figure 2. Cassava Marketing Channels in Tulang Bawang Udik Subdistrict, West Tulang Bawang Regency.

Figures 1 and 2 show that there are three cassava marketing channels in the Tulang Bawang Tengah Subdistrict, West Tulang Bawang Regency:

- Marketing Channel I (Farmer–Lapak–Factory): Two percent of the total cassava production is sold through lapak.
- Marketing Channel II (Farmer–Agent–Factory): Sixty percent of the total cassava production is sold through agents.
- Marketing Channel III (Farmer–Factory): Thirty-eight percent of cassava production is sold directly to factories without intermediaries. This occurs in Karta Rahardja Village, where cassava is sold directly to PT BTJ.

The costs, farmers' share, and marketing margins of cassava in West Tulang Bawang Regency are presented in Table 1.

Table 1. Costs, Shares, and Marketing Margins of Cassava in West Tulang Bawang Regency.

No	Information	Unit	Marketing Channel 1 (Farmer-Stall-Factory)		Marketing Channel 2 (Farmer-Agent-Factory)		Marketing Channel 3 (Farmer-factory)	
			Value	Share (%)	Value	Share (%)	Value	Share (%)
1	Farmer Selling Price	IDR/Kg	548.18	59%	565.37	96%	567.31	100%
2	Stall Buying Price	IDR/Kg	548.18		-		-	
	Stall Selling Price	IDR/Kg	922.00		-		-	
	Marketing Margin	IDR/Kg	373.82		-		-	
	Marketing Cost	IDR/Kg	256.63		-		-	
	Rafaktion (Factory)	IDR/Kg	169.05		-		-	
	Penyusutan	IDR/Kg	8.05		-		-	
	Transportation	IDR/Kg	70.00		-		-	
	Labour (driver)	IDR/Kg	1.28		-		-	
	TK (angkut)	IDR/Kg	6.00		-		-	
	Bongkar	IDR/Kg	1.25		-		-	
	Antri	IDR/Kg	1.00					
	Profit Margin	IDR/Kg	117.19		-		-	
	RPM	IDR/Kg	0.46		-		-	
3	Agent Buying Price	IDR/Kg		0%	565.37	96%		
	Agent Selling Price	IDR/Kg			586.96			

	Marketing Margin	IDR/Kg			21.59			
	Marketing Cost	IDR/Kg			10.08			
	Communication	IDR/Kg			0.23			
	Premi driver	IDR/Kg			9.85			
	Profit Margin	IDR/Kg			11.51			
	RPM	IDR/Kg			1.14			
4	Factory Buying Price	IDR/Kg	922.00		586.96		567.31	

Marketing costs in Marketing Channel I are predominantly incurred by lapak, including refraction (IDR 169.05/kg), depreciation (IDR 8.05/kg), transportation (IDR 70.00/kg), driver labor (IDR 1.28/kg), loading (IDR 6.00/kg), unloading (IDR 1.25/kg), and waiting (IDR 1.00/kg) costs. Longer marketing channels result in higher costs due to the involvement of more labor and marketing institutions. In Marketing Channel II, agents incur marketing costs, including communication costs (IDR 0.23/kg) and driver premiums (IDR 9.85/kg). In Marketing Channel III, there is no marketing margin, and farmers receive a 100 percent farmer's share. This indicates that Marketing Channel III (Farmer–Factory) is the most efficient cassava marketing channel in the West Tulang Bawang Regency.

However, when considering marketing margins and RPM values, none of the three marketing channels could be classified as fully efficient. This inefficiency occurs because the profits received by farmers are not evenly distributed owing to the involvement of multiple marketing institutions. Additionally, inadequate technology and insufficient extension services contribute to inefficiencies in cassava marketing (Mafimisebi, Akinbobola, & Awoyomi, 2023). Farmer's share is not always a sole indicator of marketing efficiency; a high farmer's share does not necessarily imply efficiency if the marketing institutions involved do not achieve satisfactory returns (Asmarantaka, 2012). Furthermore, differences in the total profits received by each institution are influenced by the number of marketing institutions faced by farmers (Bobihu et al., 2022).

5. Conclusions
5.1 Conclusions
This study identifies three cassava marketing channels in Lampung Province involving five marketing actors: farmers, lapak (collectors), agents, and the final consumers (tapioca factories). The longest marketing channel is the Farmer–Lapak–Agent–Factory channel, whereas the shortest channel, Farmer–Factory, is identified as the most efficient. Overall, the cassava marketing system in Lampung Province has not yet achieved marketing efficiency. This inefficiency is reflected in relatively high marketing margins, a low farmer's share, and uneven Profit Margin Ratios among marketing institutions, indicating an unequal distribution of benefits along the marketing chain.

5.2 Research Limitations
This study is limited to cassava marketing in Lampung Province and may not fully reflect marketing conditions in other regions. Data were collected during a specific period (October 2020 to July 2021), which may not capture long-term trends or seasonal variations. Future studies should explore cassava marketing in other provinces to allow for a comparative analysis. Additionally, research could investigate the impact of government policies, market infrastructure improvements, and technology adoption on marketing efficiency. Including a wider range of marketing actors and examining their roles in the value chain would further enhance our understanding of cassava marketing systems. Moreover, future studies should examine the influence of external factors such as climate change and global commodity prices on cassava production and marketing efficiency.

5.3 Suggestions and Directions for Future Research
To improve the efficiency of cassava marketing in Lampung Province, efforts should be directed toward shortening marketing channels by strengthening direct linkages between farmers and processing factories in Lampung Province. Farmers' bargaining power should be enhanced through institutional support, such as farmer cooperatives or collective marketing systems, to increase the farmers' share. Policymakers are encouraged to improve market access, price transparency, and infrastructure to reduce

the marketing costs. Future studies should include a wider geographical scope, consider seasonal price fluctuations, and incorporate institutional and contractual arrangements to provide a more comprehensive understanding of cassava marketing efficiency.

Acknowledgments

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