JPPIPA 12(5) (2026)

Jurnal Penelitian Pendidikan IPA

http://jppipa.unram.ac.id/index.php/jppipa/index

Assessing the Marketing Efficiency of Fresh Fruit Bunch (FFB) of Oil Palm by Independent Smallholders

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Received: February 09, 2026
Revised: April 16, 2026
Accepted: May 25, 2026
Published: May 31, 2026

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DOI: 10.29303/jppipa.v12i5.14951

Abstract: Large oil palm production creates opportunities for independent smallholders; however, complex marketing chains and fluctuating prices often reduce farmers' income and bargaining power. This study offers novelty by comparing the efficiency of three different fresh fruit bunch (FFB) marketing channels among independent smallholders in Mersam District, Batanghari Regency, while simultaneously evaluating marketing margins, farmer's share, and marketing efficiency indicators within the local supply chain structure. A survey method was employed involving 55 independent smallholders selected using proportionate stratified random sampling, while marketing institutions were identified using snowball sampling. Marketing efficiency was analyzed using marketing margin, farmer's share, and efficiency formulas. The findings identified three marketing channels: Channel I (smallholders–small collectors–large collectors–factories), Channel II (smallholders–large collectors–factories), and Channel III (smallholders–village unit cooperatives–factories). Channel III demonstrated the best performance with the lowest marketing margin (IDR 153/kg), the highest farmer's share (92.24%), and the lowest efficiency value (4.07%), compared to Channel I with a marketing margin of IDR 248/kg and efficiency value of 6.48%, and Channel II with a marketing margin of IDR 167.43/kg and efficiency value of 4.10%. These results indicate that cooperative-based marketing channels are more efficient and provide greater benefits to smallholders. Simplifying marketing chains and strengthening institutional collaboration can improve farmers' bargaining position and increase the share of FFB prices received by independent smallholders.

Keywords: Efficiency; Independent smallholders; Marketing channels; Oil palm

Introduction

Plantations involve a wide range of activities that focus on managing natural resources, human resources, production facilities, tools and machinery, cultivation, harvesting, processing, marketing, and overall management. The ultimate goal is to benefit both plantation entrepreneurs and the surrounding community (Law of the Republic of Indonesia, 2004). Palm oil plays a crucial role in the Indonesian economy's plantations. Between 2014 and 2018, there was a consistent and steady increase in the size of oil palm plantations in Indonesia, regardless of ownership status (Jambi BPSP, 2024). In Batanghari Regency, there are eight sub-districts involved in palm oil cultivation. Among them, Mersam stands out as the second-largest accounting for 22.31% of the total area in Batanghari Regency (Central Statistics Agency, 2022).

Mersam District's large palm oil production demonstrates various marketing systems, particularly

How to Cite:
Yanita, M., Wahyuni, I., Fauzia, G., Rahmah, K., Siadari, U., Kurniasih, S., … Mukhlis. (2026). Assessing the Marketing Efficiency of Fresh Fruit Bunch (FFB) of Oil Palm by Independent Smallholders. *Jurnal Penelitian Pendidikan IPA*, *12*(5), 420–430. https://doi.org/10.29303/jppipa.v12i5.14951

when considering the prices received by smallholders. Although Mersam District produces more palm oil FFB than other districts, but the high production levels are not reflected in the selling prices or the substantial price differences at the farmer level. This causes in suboptimal income for smallholders in Mersam District, despite their high FFB production (Doloksaribu B, 2024). The selling price of palm oil FFB, which tends to fluctuate and decline from 2024 to 2023 Saputra (2022), serves as evidence of this. The large price difference is due to high marketing costs. High marketing costs tend to cause the difference or gap between the prices received by smallholders and the prices received by consumers (Tety et al., 2013). All parties involved in the marketing system will receive profit sharing because of marketing costs. Therefore, the efficiency of marketing costs is an important factor in determining the welfare of smallholders and other distribution actors (Putri et al., 2018).

Previous research from Putri et al. (2018) on the Marketing Efficiency of Fresh Fruit Bunches (FFB) in Independent Oil Palm Plantations revealed that Channel I was the most efficient. This channel enabling smallholders to achieve the highest profit share of 90.29% while maintaining the lowest marketing margin, indicating optimal efficiency in this channel. This contrasts with Channels II and III, where the increase in the number of intermediaries leads to a decrease in farmer share and an increase in marketing margin, indicating lower efficiency. This finding suggests that minimizing intermediaries can significantly boost the profits returned to smallholders. These findings not only affirm the need for a more streamlined marketing channel structure but also suggest that policies and practices supporting direct market access can significantly increase smallholders' income. Similarly, Sinaga et al. (2025) identified three marketing channels and reported that Channel III was the most efficient, providing the highest farmer's share (83.33%) and relatively lower marketing margins compared to other channels. These findings show that the structure of marketing channels has a direct effect on the level of marketing efficiency and farmers' welfare, and indicates the importance of minimizing intermediaries to improve farmers' bargaining positions in the FFB marketing system.

Distribution channels play a role in displaying, marketing, and distributing products or services physically to consumers or end users (Kotler & Armstrong, 2008). The structure of the marketing channel explains how agricultural products move from farmers to buyers. If the chain is too long, the share of the price that farmers receive is usually smaller due to the many additional costs along the chain (Djazuli et al., 2025). A study conducted by Oktavianus et al. (2019) concluded that the most efficient marketing channel was the shortest (farmer–collector–palm oil mill), characterised by the lowest marketing costs and relatively high profit margins. This study also emphasises that the length of the marketing chain directly affects marketing costs, margins, and the share of the price received by farmers.

Marketing margins are influenced by the length of the marketing channel. The longer the marketing channel, the larger the margin. Longer marketing channels are predictably less efficient (Ardillah & Hasan, 2020). High margins may indicate high transaction costs, particularly in areas with limited infrastructure (Rangkuti et al., 2025). Farmers do not always benefit from price increases, but they quickly feel the impact when prices fall (Kamaruddin et al, 2021). Research by Sumartono et al. (2018) concluded that there are two marketing channels for fresh fruit bunches (FFB): Channel I (farmers–collectors–palm oil mills) and Channel II (farmers–farmer groups–palm oil mills). Based on an analysis of operating margins and the profit-to-cost ratio, only Channel I in Bani City Village was deemed efficient. This channel had a marketing margin of IDR 206/kg with a profit-to-marketing-cost ratio of 1.17. These findings indicate that marketing efficiency is influenced not only by the number of intermediaries but also by the cost structure and institutional arrangements within each channel.

Although various studies have examined the marketing efficiency of FFB, the results obtained still show inconsistencies regarding which marketing channels are the most efficient. Some studies conclude that the shortest channel is the most efficient, while other studies emphasize the importance of institutional partnerships or specific cost structures as a determining factor. These differences in results show that marketing efficiency is greatly influenced by regional characteristics, institutional structures, and farmers' bargaining positions. Despite numerous studies on FFB marketing efficiency, limited studies have specifically examined the comparative efficiency of cooperative-based and trader-based marketing channels among independent oil palm smallholders in Mersam District, one of the major oil palm production areas in Batanghari Regency. Previous studies generally focused only on marketing margins or farmer's share without integrating multiple efficiency indicators within the local supply chain structure. Therefore, this study contributes novelty by simultaneously analyzing marketing channels, marketing margins, farmer's share, and marketing efficiency values to identify the most efficient institutional arrangement for independent smallholders. This research is important because inefficient marketing systems may weaken farmers' bargaining positions, increase transaction costs, and reduce income received

by smallholders despite high production levels. The findings are expected to provide policy recommendations for strengthening cooperative institutions, improving price transparency, and developing a more efficient and equitable FFB marketing system for independent oil palm farmers.

According to this description, the study aims to achieve two main objectives. Firstly, it aims to provide a detailed overview of the marketing activities related to fresh fruit bunches of independent oil palm smallholders in Mersam District, Batanghari Regency. Secondly, it aims to analyze the efficiency of the marketing process for these fresh fruit bunches.

Method

The research focuses on independent smallholders in Mersam District, selected through purposive method (Mukhlis et al., 2019; Mukhlis et al., 2024; Asgaf et al., 2025). This study aims to gain an understanding of the marketing dynamics, profit margins, and operational efficiency of palm oil FFB in Mersam District. Secondary data were collected from various external sources, such as reports, literature, and data provided by relevant institutions and agencies. This research also required additional support data from BPS, including information on the geographical conditions of the research area, population statistics, education levels, and the socio-economic status of the local community. The research procedure consisted of several stages, including: (1) determination of the research location purposively in Mersam District; (2) identification of independent smallholders and marketing institutions; (3) sampling of 55 respondents using proportionate stratified random sampling; (4) data collection through interviews, observation, and documentation; (5) identification of marketing channels and marketing actors; and (6) analysis of marketing margins, farmer's share, and marketing efficiency indicators.

In this study, the author employed the proportionate stratified random sampling technique. This technique was chosen due to the diverse nature of the population in the research area (Soekartawi, 2002b). Proportionate stratified random sampling is employed when the population consists of members or elements that are not uniform and evenly stratified. The research focuses on farmer groups that sell palm oil FFB based on their geographical location. A total of 55 smallholders were included in this research. Determination of sample members was carried out randomly, by drawing names from each division to obtain the required number of samples for each stratum. Sampling for intermediary institutions, including collecting traders and cooperatives, was carried out using the snowball sampling technique.

Figure 1. Research flowchart

The analytical method used to answer the first objective was a qualitative descriptive analysis method (Sugiyono, 2022; Mukhlis et al., 2022; Ogari et al., 2026). This method aims to explain how the marketing channel for independent smallholder FFB reaches the final consumer (Oil Palm Factory) through several marketing institutions including collecting traders and Cooperation. To address the second objective, qualitative descriptive analysis was also used.

Marketing Margin Calculation

Mathematically, marketing margin is calculated using the following formulation (Sudiyono, 2006).

$$MPi = Pri - Pfi \quad (1)$$

$$MPi = \sum Bi + \sum ki \quad (2)$$

Information

Mpi = Palm oil marketing margin to trader i (IDR/Kg),
Pri = Selling price of palm oil to the i-trader (IDR/Kg),
Pfi = Purchase price of palm oil from farmer i (IDR/Kg),
bi = Total costs incurred by marketing institutions (b1, b2, b3,…bn),

Ki = Total profits earned by marketing institutions (K1, K2, K3,… Kn),

Calculating the Amount of Marketing Costs

Calculating the amount of marketing costs can use the following menu formula (Soekartawi, 2002b):

$$Bp = B1 + B2 + Bn \quad (3)$$

Information:
Bp = Marketing Costs (IDR/Kg),
B1 = Loading and unloading costs (IDR/Kg),
B2 = Transportation Costs (IDR/Kg), Bn = Other costs.

Farmer's Share

According to Hanafiah et al. (1983), to calculate the share received by smallholders or the size of smallholders' share for oil palm commodities, it is formulated as follows:

$$Fs = \frac{Pfi}{Pri} \times 100\% \quad (4)$$

Information:
Fs = Share or percentage received by smallholders (%), Pfi = Farmer level price received by smallholders (IDR/Kg), Pri = Price received by traders (IDR/Kg).

Marketing Efficiency

According to Soekartawi (2002a), the efficiency of marketing channels in the research area is as follows:

$$Efficiency = \frac{Total\ Marketing\ Cost}{Total\ Value\ of\ Product} X\ 100\% \quad (5)$$

If the marketing efficiency value is less than 50%, it indicates that the marketing channel is efficient. If the efficiency value exceeds 50%, it indicates an inefficient marketing channel. Conversely, if the efficiency value equals 50%, the marketing channel can be considered inefficient.

Result and Discussion

The state of the population significantly influences economic growth and development, as harnessing the skills and abilities of human resources within the region holds great potential for progress. The population of a region plays a crucial role in driving economic growth and development. By harnessing the skills and abilities of the human resources within the region, there is great potential for progress (GS, 2009).

The socio-economic and social conditions of the population in Mersam District are primarily driven by income sources from agriculture, particularly rubber and oil palm plantations, along with livestock businesses and horticultural cultivation by local women's groups. Mersam District is one of the districts whose main source of income comes from the agricultural sector, namely rubber and oil palm plantations. The community in Mersam District also generates income from the livestock business. Another economic source is the existence of a group of PKK women who utilize unused government land resources to cultivate horticultural crops.

The development of facilities and infrastructure in an area can determine the progress of a region. The social facilities in question can be education, health and transportation facilities. Mersam District has 28 educational facilities, 93 health workers and places of worship for the local community. In Bukit Harapan Village there are educational facilities, namely 1 Early Childhood Education, 1 Kindergarten, 2 Elementary Schools, 1 Middle School, and there are 4 Midwives and 2 Integrated Health Service Post. Belanti Jaya Village has facilities such as 1 Early Childhood Education Building Unit, 1 Kindergarten Building Unit, 1 Elementary School Unit, 1 Madrasah Building Unit, and 2 Integrated Health Service Post. Access from each village can be reached using land access in the form of two-wheeled or more four-wheeled vehicles.

Farmer identity according to age reveals that the largest group of smallholders in Mersam District show that the largest group of smallholders in Mersam District fell within the age range of 38-42 years, comprising 15 individuals and accounting for 27.27% of the total. The average age of oil palm smallholders in Mersam District is 44 years. According to a study Ilham (2022), younger smallholders tend to be more eager to learn and explore new knowledge. Farmer Identity According to Education Level. The education level in Mersam District, where a significant number of smallholders reside, is primarily at the junior high school level. Out of the total number of smallholders surveyed, 23 individuals had completed their education at the junior high school level, accounting for 41.82% of the sample. There are 19 smallholders who have completed primary school education, making up 34.54% of the total. Additionally, there are 12 smallholders who have completed secondary or high school education, accounting for 21.82%. In addition, there is one farmer who holds a bachelor's degree. Based on the theory of human capital, it is anticipated that a greater level of education will enhance the productivity and efficiency of smallholders, leading to an overall improvement in their well-being (Hendraini et al., 2024).

The selected smallholders have extensive farming experience, with the majority having 15-20 years of experience. Specifically, 17 smallholders, accounting for 30.91% of the sample, fall within this range. There are 12 smallholders who have over 25 years of experience in oil

palm farming, making up 20% of the total. In the 10-15 year range, there are 16 smallholders, accounting for 29.1% of the total. Additionally, there are 8 smallholders in the 5-10 year range, representing 14.55% of the total. Meanwhile, there are still some smallholders who have limited farming experience, specifically in the range of 0-5 years. This group consists of a total of 3 smallholders, accounting for approximately 3.44% of the total. According to work experience theory, the more time someone spends in a job, the more skilled they become at managing a business. This increased competence can lead to higher levels of productivity and efficiency (Sari et al., 2024).

The respondents in this study engaged in oil palm farming in Mersam District as independent smallholders. Smallholders in Mersam District who engage in oil palm farming primarily implement management practices based on their own expertise, including the application of fertilizers, pesticides, and other necessary measures. The land area owned by smallholders in Mersam District varies, but it is dominated by 2 ha with 44 smallholders, accounting for 80%.

According to the research findings, there were 12 traders collecting FFB, from a total of 12 collecting traders, with 7 being large collecting traders and 5 being small collecting traders. Based on age, a significant portion of small traders in Mersam District fall within the 42 - 48 years old range, accounting for 40% of the total. Meanwhile, among large traders, the majority of traders fall within the age range of 42-48 years, accounting for 57.14% of the total. All traders surveyed, whether small collectors or large collectors, had received formal education at various levels, including elementary school, middle school, and high school. Small and large collecting traders have trading experience ranging from 10-15 years, with 60% for small collecting traders and 71.43% for large collecting traders.

Currently, there is only one active COOPERATION unit, called COOPERATION Sumber Rezeki, dedicated to serving smallholders' FFB marketing in the research area was Established in 1992, COOPERATION Sumber Rezeki has remained actively involved in the marketing of smallholders' FFB. The cooperative oversees at least 13 farmer groupsand plays a crucial role in supporting oil palm smallholders in Mersam District. Cooperation Sumber Rezeki empower smallholders by providing financial management services, including savings and loans, as well as assisting with their production input needs. Additionally, the cooperative help smallholders by facilitating the marketing of fresh fruit bunches to palm oil mills.

The overview of Fresh Fruit Bunches (FFB) marketing in Mersam District highlights the complexity of various marketing channels and their impact on price fluctuations and smallholders' income. In this marketing channel, smallholders sell FFB to small village collecting traders. Typically, smallholders personally deliver their palm oil FFB production to the small collecting trader's Produce Collection Place (TPH). However, in certain cases, small collecting traders may pick up the farmer's FFB directly from the land using a pickup truck. Several research respondents in this marketing channel sell their palm oil FFB products to small traders. In total, there are 8 smallholders involved in this process. The selling price of fresh fruit bunches (FFB) received by smallholders varies between IDR/Kg 2.386,82 and IDR/Kg 2.585,21, with an average of IDR/Kg 2520.

Marketing channel I have four institutions, starting from the smallholders until the oil palm factory: Smallholders → Small Collecting Traders → Large Collecting Traders → Oil Palm Factory. Once the small collecting traders have collected the FFB, the large collecting traders will pick it up. Small collecting traders typically pick up the FFB twice a week. The selling price of FFB to large collecting traders in this channel is in an average of IDR/Kg 2,494.82. After smallholders and small collecting traders have collected the FFB, the large collecting traders will load it onto trucks for sale to nearby factories, such As Oil Palm Factory "Deli Muda Perkasa (DMP)" and Oil Palm Factory "Asian Agri". In Marketing channel II, smallholders sell FFB to large collecting traders who generally pick up FFB from smallholders' land. 22 smallholders sell FFB to large collecting traders on this channel. The selling price of FFB received by smallholders is IDR/Kg 2,634.82. Smallholders → Large Collecting Traders → Oil Palm Factory. After the FFB meets the truck load quota, the FFB is then transported to the factory.

In Marketing channel III, Smallholders sell their FFB to Village Unit Cooperatives (Cooperations) through this channel. The cooperative has twenty-five smallholder members. The collected FFB is transported to the appropriate collection location for weighing by each field. The FFB weighing findings are recorded in the farmer group book. Each farmer's FFB production figures are documented by the farmer group leader. Smallholders → Cooperation→ Palm Oil Factory. The collected and weighed FFB is then transported to the predetermined factory. In this study, the selling price of FFB through Cooperation at Oil Palm Factory underwent fluctuations, with the price changing five times. The price average was IDR/Kg 2,738.21.

Every sale and purchasing activity conducted by smallholders, small collectors, and large collectors, as well as Cooperations and Oil Palm Factorys, ends with a transaction or payment. Small collecting traders typically receive cash payments, while large collecting traders have the option to pay in cash upon purchasing FFB or in instalments based on agreements with small

collecting traders and smallholders. This arrangement is usually made between parties who have established a long-term relationship and trust. In the case of Cooperation, payments to smallholders are typically processed within 3-5 days after the FFB is harvested. The payment system utilized involves cash transactions facilitated by the leader of each farmer group.

The different payment systems in the palm oil value chain reflect the varying levels of trust and relationships between business actors. Establishing a strong bond between smallholders and large traders through extensive interactions fosters a sense of trust, enabling more flexibility in payment arrangements. Smallholders sell their FFB to Village Unit Cooperatives (Cooperations) through this channel. The cooperative has twenty-five smallholder members. Each field transports the collected FFB to the appropriate collection location for weighing. The farmer group book records the FFB weighing findings. The farmer group leader documents each farmer's FFB production figures (Rahman, 2021).

Marketing Functions for Every Oil Palm Fresh Fruit Bunch (FFB) Marketing Actor in Mersam District presented in Table 1.

Table 1. Marketing Functions for Each Marketing Actor of Fresh Fruit Bunches (FFB) of Independent Smallholder Oil Palm

Marketing Function	Activity	Actors in Marketing Activities			
		Farmer	PPK	PPB	Cooperation
Exchange	Sale	√	√	√	√
	purchase	×	√	√	√
Physique	Transportation	√	√	√	√
	Storage	×	√	√	×
	Processing	×	×	×	×
Facility	Sorting	×	√	√	√
	P. Risk	•	√	√	√
	Financing	√	√	√	√
	Market Information	√	√	√	√

Description: PPK: Small Collecting Traders, PPB: Large Collecting Trader, COOPERATION: Village Unit Cooperative, •: Occasionally Performs a Function, √: Fully Performs Function, ×: Does Not Perform Function

It is widely known that all actors involved in the marketing of fresh oil palm fruit bunches engage in exchange marketing (sales activities), physical marketing (transportation activities), and facilities marketing (financing and market information). It is important to note that not all participants in marketing activities undertake processing activities. When it comes to risk-bearing activities, it is evident that smallholders often fall short in fulfilling their responsibilities due to the unpredictable nature of the risks they encounter.

Weaknesses in risk management within the agricultural industry can pose a threat to the long-term sustainability of oil palm farming. Smallholders are particularly susceptible to losses when they lack sufficient support in managing price fluctuations, weather conditions, and pest infestations. Therefore, it is crucial for other parties, like Cooperation or the government, to step in and implement effective protection measures. This could include agricultural insurance or improved access to timely and precise market information. These interventions would greatly help in minimizing the risks that smallholders face (Yolanda, 2021).

The amount of marketing costs in the existing marketing channels in Mersam District can be seen in the table 2 as follows.

Table 2. Marketing Costs Borne by Each Marketing Activity Actor in Each Marketing Channel

Cost Description IDR/Kg	Marketing Channels		
	I	II	III
Farmer			
Total Marketing Costs	-	-	-
Small Collecting Traders			
Total Marketing Costs	47.00	-	-
Large Collecting Traders			
Total Marketing Costs	79.97	80.81	-
Cooperation			
Total Marketing Costs	-	-	80.37
Total Marketing Costs	126.97	80.81	80.37

Source: Processed Primary Data

The marketing costs mentioned in this study are the expenses incurred by each marketing institution, including small collecting traders, large collecting traders, and Cooperation, when marketing farmer's FFB to Oil Palm Factory. Transportation costs, loading and unloading costs, and retribution costs are some of the costs associated with FFB marketing that each marketing institution incurs. Based on the research findings, it is evident that channel I show the highest total marketing costs, amounting to 126.97 IDR/Kg. The overall marketing expenses are significant due to the involvement of two marketing institutions, which results in traders bearing the costs of transportation, loading, and unloading of FFB. As a result, the total costs are higher compared to alternative channels. Channel III has the lowest total marketing costs at Rp. 80.37/kg. This channel involves smallholders selling their FFB directly to the Cooperation and then proceeding to the Oil Palm Factory.

Variations in total marketing costs across different marketing channels suggest differences in the operational efficiency of each marketing agency. Marketing channels with a greater number of intermediaries often result in increased expenses, mainly due to additional costs associated with transportation, loading, and unloading. The difference in marketing costs between channels reflects the difference in the number of intermediaries and the level of coordination between actors. Channels with more intermediaries tend to have higher accumulated transportation, loading and unloading, and administration costs. Sinaga et al. (2025) mentioning that channels with fewer intermediaries have lower total costs due to shorter distribution chains and better price coordination. This suggests that cost efficiency has a lot to do with channel structure and institutional arrangements. On the other hand, marketing channels that are shorter, like channel III, demonstrate increased efficiency as a result of reduced marketing expenses. This, in turn, can lead to higher profits for smallholders. It has been found that streamlining marketing channels and enhancing logistics can greatly boost farmer profit margins (Radot, 2019).

The amount of marketing margin in the existing marketing channels in Mersam District can be seen in the table 3.

Table 3. Marketing Margin Analysis for Each Marketing Channel

Information	Channel I		Channel II		Channel III	
	IDR/Kg	F'S (%)	IDR/Kg	F'S (%)	IDR/Kg	F'S (%)
Farmer						
Marketing Costs	-		-		-	
Farmer's share	2,386.82	87.34	2,527.63	91.50	2,585.21	92.24
Small Collecting Traders						
Purchase price	2,386.82					
Marketing Costs	47.00					
Profit	61.00					
Selling price	2,494.82					
Marketing Margin I	108.00	5.51				
Large Collecting Traders						
Purchase price	2,494.82		2,527.63			
Marketing Costs	79.97		80.81			
Profit	60.03		86.62			
Selling price	2,634.82		2,695.06			
Marketing Margin II	140.00	7.15	167.43	8.50		
Cooperation						
Purchase price					2,585.21	
Marketing Costs					80.37	
Profit					72.63	
Selling price					2,738.21	
Marketing Margin III					153.00	7.76
Total cost	126.97		80.81		80.37	
Total Marketing Margin	248.00	12.66	167.43	8.50	153.00	7.76
Total Profit	121.03		86.62		72.63	

Source: Processed Primary Data

In marketing channel I, the total FFB marketing margin value was achieved at IDR 248.00/kg, representing 12.65% of the purchase price of the final consumer, namely Oil Palm Factory. The marketing margin in this channel is affected by the expenses associated with marketing the FFB to the factory's end

consumers. These expenses primarily include freight and transportation costs. This aligns with the findings of previous studies (Nugroho, 2015). Based on the research findings, it is evident that among the two marketing channels analyzed, channel I stands out as the most profitable. This is primarily due to its extensive reach, involving two different marketing institutions. Table 14 in channel II demonstrates the presence of a marketing institution that focuses on selling directly to factories as the end consumers of FFB. This institution is represented by large collecting traders. In marketing channel II, a marketing margin of IDR 167.43/kg was achieved, accounting for 8.50% of the final consumer purchase price. Channel III is limited to Cooperation and Oil Palm Factory marketing institutions as the end consumers. In marketing channel III, the total marketing margin is IDR 153.00/kg, which accounts for 7.76% of the price paid by the final consumer. According to the price offered to smallholders, Cooperation generates a profit of IDR 72.63 per kilogram.

Another factor to consider when assessing marketing efficiency is the marketing margin. This involves comparing the findings of the author's research with previous studies. According to previous research Soekartawi (1995), the marketing margin for channel I is IDR 500/kg, and channel II is IDR 300/kg. The analysis results indicate that both marketing channels are efficient. The margin figure obtained from previous research exceeds the marketing margin figure in this study. In channel I, the marketing margin is IDR 248,-/kg, while in channel II it is IDR 167.43/kg, and in channel III it is IDR 153,-/kg. After analyzing the marketing margins, it becomes clear that marketing channels I, II, and III demonstrate high efficiency. This also applies to the marketing of oil palm FFB from independent smallholders in Mersam District, which proves to be efficient. Marketing margin differences show how value is distributed among actors in the supply chain. High margins do not necessarily mean inefficiency, but if accompanied by a low farmer's share, it can indicate a disproportionate distribution of benefits. Putriana et al. (2023) asserts that longer marketing chains tend to widen margins and lower the share of prices that farmers receive, especially in areas dominated by independent smallholders. The size of the farmer's share in the marketing channels in Mersam District can be seen in the Table 4.

Table 4. Farmer's Share of Palm Oil from Independent Smallholders

Marketing Channels	Price at Farmer Level (IDR/Kg)	Price at Final Consumer Level (Oil Palm Factory) (IDR/Kg)	Farmer's Share (%)
I	2,386.82	2,732.80	87.34
II	2,527.63	2,762.44	91.50
III	2,585.21	2,802.70	92.24

Source: Processed Primary Data

According to Table 4, it is apparent that the marketing channel III (smallholders—Cooperation—Oil Palm Factory) has the highest percentage of the farmer's share, which amounts to 92.24%. In contrast, marketing channels I and II have a significant farmer's share, with percentages of 87.34% and 91.50%, respectively. According to (Elvionita, 2020), efficiency in marketing is determined by meeting specific criteria, for which a marketing margin of less than 50% and a farmer's share of more than 50% are considered efficient. According to this marketing channel, it has been observed that marketing channel III is significantly more efficient. This is due to the fact that smallholders receive a higher value (farmer's share) of 91.50%, which exceeds the 50% threshold. The findings of this study align with the research conducted by Tety et al. (2013) Their research also revealed that oil palm smallholders obtained a farmer share value of 85.05%, and smallholders in the two-level channel received a price share of 76.15%, which was the lowest among the channels. As the marketing channel becomes longer, smallholders receive lower prices for their products. A higher farmer's share indicates a more favorable price distribution for farmers. Panjaitan et al. (2023) reported that shorter marketing channels give farmer's share greater due to fewer intermediary layers and better price transmission. This shows that simplifying the marketing structure can directly improve the welfare of farmers. The increase in the number of intermediaries tends to expand the marketing margin and decrease the proportion of the price that farmers receive, as each intermediary seeks to make a profit (Faezal et al., 2023).

The indicators of the Level of Efficiency of Palm Oil TBS Marketing Channels for Independent Smallholders in Mersam District, Batanghari Regency can be seen Table 5. Based on Soekartawi (1995), it has been determined that a marketing channel is considered efficient if EP is less than 50%. Conversely, if EP is equal to or greater than 50%, the marketing channel is deemed inefficient. The marketing channels for palm oil FFB in Mersam District are highly efficient. Marketing can be optimized by reducing the marketing efficiency value (EV) to a smaller number. Based on the data in Table 5, it can be observed that marketing channel III stands out

as the most efficient option. This conclusion is drawn from the fact that it possesses the lowest efficiency value when compared to marketing channels I and II. According to recent research Elvionita (2020), it has been found that the most effective marketing channel is the one with the lowest efficiency value and the fewest marketing institutions involved.

Table 5. Indicators of the Level of Efficiency of Palm Oil TBS Marketing Channels for Independent Smallholders in Mersam District, Batanghari Regency

Description	Channel I	Channel II	Channel III
Total Marketing Costs (IDR/Kg)	126.97	80.81	80.37
Value of Final Products Marketed (IDR/Kg)	2,732.80	2,762.44	2,802.70
Efficiency Value (%)	6.48%	4.10%	4.07%

Source: Processed Primary Data

Conclusion

Smallholder's FFB marketing in Mersam District consists of three channels, namely Channel I (smallholders–small collecting traders–large collecting traders–Oil Palm Factory), Channel II (smallholders–large collecting traders–Oil Palm Factory), and Channel III (smallholders–Cooperation–Oil Palm Factory). Based on marketing margin, farmer's share, and efficiency analysis, all channels were categorized as efficient because their efficiency values were below 50%. However, Channel III was identified as the most efficient channel, with the lowest marketing margin (IDR 153/kg), the highest farmer's share (92.24%), and the lowest efficiency value (4.07%). Meanwhile, Channel I had the highest marketing margin (IDR 248/kg) and efficiency value (6.48%). These findings indicate that cooperative-based marketing channels provide greater benefits and stronger bargaining positions for independent smallholders. Based on the results of the research, strengthening cooperative institutions needs to be prioritized to improve marketing performance and farmers' welfare. Increased price transparency between mills and farmers is also needed to reduce information asymmetry. In addition, infrastructure improvements and transportation efficiency can reduce marketing costs and support a fairer marketing system. This study was limited to one research area and focused only on marketing margin, farmer's share, and efficiency indicators. Future studies are recommended to include wider research areas, price transmission analysis, institutional behavior, and social relationship factors among market actors to obtain a more comprehensive understanding of FFB marketing systems.. Overall, strengthening transparent, efficient, and cooperative-based marketing systems is essential to improve the welfare, bargaining power, and income sustainability of independent oil palm smallholders.

Acknowledgments
The author expresses our gratitude to The Research and Community Service Institute of Jambi University, which has funded this research through contract Number 321/UN 21.11/PT.01.05/SPK/2024. We would like to thank the reviewers for their valuable contributions and suggestions that made significant improvements to the paper.

Author Contributions
Conceptualization, M.Y. and I.W.; methodology, M.Y., I.W., and K.R.; validation, G.F., U.S., and S.K.; formal analysis, M.Y., I.W., and K.R.; investigation, M.Y., I.W., G.F., and K.R.; resources, U.S., S.K., and M.R.T.; data curation, M.Y. and I.W.; writing—original draft preparation, M.Y., I.W., and K.R.; writing—review and editing, G.F., U.S., S.K., M.R.T., and M.K.; visualization, K.R. and G.F.; supervision, M.R.T. and M.K. All authors have read and agreed to the published version of the manuscript.

Funding
This research received no external funding.

Conflicts of Interest
The authors declare no conflict of interest.

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