ANALYSIS OF MARKETING COSTS, PROFIT MARGINS AMONG ACTORS, MARKETING CHANNEL EFFICIENCY, AND FARMER'S SHARE DISTRIBUTION IN THE PALM OIL MARKETING SYSTEM: A LITERATURE REVIEW BASED ON A VALUE-ADDED APPROACH

Farida Akbarina
Politeknik Negeri Malang
faridaakbarina@polinema.ac.id

Tehedi
Universitas Sultan Muhammad Syafiuddin Sambas

Abstract

This study analyses marketing costs, profit margins between actors, marketing channel efficiency, and farmer's share distribution in the Indonesian palm oil marketing system through a literature review. The results show high marketing costs of Rp450-1,200/kg (22-30% of the fresh fruit bunch price), margin disparities (farmers 25-35% vs mill 35-42% added value), average channel efficiency of 24.6% (ideal <15%), and a national farmer's share of 71.4% (standard >80%) due to long supply chains and local oligopsony. The value-added approach reveals a redistribution potential of 12-18% through channel shortening, e-FFB trading digitalisation, and plasma partnerships recommended to increase systemic efficiency by 15-20% and the welfare of farmers managing 40% of the national area.

Keywords: palm oil, marketing costs, profit margins, channel efficiency, farmer's share, added value, TBS supply chain, smallholder marketing.

Introduction

Palm oil is one of Indonesia's strategic plantation commodities, contributing billions of US dollars to the country's foreign exchange earnings each year. with an area of more than 16 million hectares in 2024 and fresh fruit bunch (FFB) production exceeding 300 million tonnes, making it the world's largest producer and a pillar of the rural economy in Sumatra, Kalimantan and Sulawesi (Widodo, 2022). This sector's contribution to the national GDP is around 3-4%, indicating high economic dependence, with smallholder farmers managing around 40% of the production area but often facing income disparities due to marketing system inefficiencies. Historical data from the Ministry of Agriculture confirms that exports of crude palm oil (CPO) and its derivatives reached 34 million tonnes in 2024, supporting a positive trade balance despite facing international regulatory pressures such as the European Union's deforestation policy, which affects market access (Obon, 2021).

Smallholders, as the main actors with 40.5% of the total national palm oil area or around 6.5 million hectares, produce more than 100 million tonnes of fresh fruit bunches (FFB) per year, but their income is eroded by a long supply chain involving collectors, middlemen and palm oil mills (PKS), where marketing costs reach 20-30% of the final selling price. This inefficiency is evident in the average farmer's share of only 65-75% in indirect

channels, far below the potential 90% in direct sales to PKS, thereby exacerbating economic inequality in major producing rural areas such as Riau, North Sumatra, and West Kalimantan (Nasution, 2019).

The palm oil marketing system involves a long chain of actors, from farmers, collectors, middlemen, to palm oil mills (PKS) and exporters, where high marketing costs such as transportation, storage, and commissions often erode farmers' profit margins to only 60-80% of the final product price, as seen in case studies in various major producing provinces such as Riau and North Sumatra (Wika Srihartati Marbun, 2021). This chain typically consists of 3-5 marketing channels, with the longest channel involving up to five actors, each adding 10-15% in operational costs per stage, bringing the total marketing cost to £10-15 per kg of fresh fruit bunches at the local level, reducing the economic value that reaches farmers and hindering their investment in land rejuvenation (Baroh et al., 2023).

The profit margins between actors reveal a structural imbalance, with middlemen earning margins of up to £3-6 per kg of FFB, while farmers earn only £1-2 per kg, reflecting local oligopsony that limits farmers' bargaining power and causes slow price transmission from international markets to the farmer level. Collecting traders often control 30-40% of the total margin through control of price information and temporary storage facilities, while farmers face the risk of delayed payments and fluctuations in FFB quality, limiting farmers' value-added contribution to 25-35% of the total supply chain even though they provide 100% of the primary raw materials (Hidayat, 2024).

This imbalance is exacerbated by the oligopsonistic market structure in which 2-3 dominant middlemen control 70% of CPO volume in producing villages, resulting in a price transmission coefficient of only 0.4-0.6, meaning that a global CPO price increase of Rp1,000/kg is only passed on to farmers as Rp400-600/kg after a 2-3 week delay, in contrast to the rapid response downstream in the chain. kg to farmers after a 2-3 week delay, in contrast to the rapid response downstream in the chain. Analysis from various literature reviews indicates that shortening the channel through farmer-PKS partnerships can increase farmer margins by up to £600-800/kg and accelerate price transmission to 0.8-0.9, while reducing total marketing costs by 25-30% for the entire system (Cahyono et al., 2022).

Marketing channel efficiency is a crucial issue, with an average efficiency index of 10-20% in long channels involving 4-5 actors, compared to direct farmer-PKS channels which achieve up to 90% efficiency, thereby reducing added value for farmers and hindering sustainable development in this sector. The distribution of the farmer's share, which is the proportion of the final selling price received by farmers, is often low at below 70% in indirect channels, whereas the ideal standard is 85-95% to ensure farmers' welfare; data from various studies highlight the need for policy intervention to shorten channels and increase this share (Pratama et al., 2024).

The value-added approach in palm oil marketing analysis allows for the measurement of each actor's economic contribution through the formula value added = selling price - production costs, which reveals that 60-70% of the value added is captured

downstream by mills and exporters, leaving farmers with a minimal share. This inefficiency problem is exacerbated by external factors such as global CPO price fluctuations due to EU biodiesel demand and deforestation issues, as well as internal factors such as farmers' lack of access to market information and post-harvest technology, which causes post-harvest losses of up to 15-20% of FFB production (Suryani, 2019).

The socio-economic impact of marketing inefficiency is evident in the high poverty rate of oil palm farmers, which remains above 20% in some areas, despite the sector's contribution to employment reaching 4.5 million people, emphasising the urgency of a literature review to formulate a value-added marketing model.

Research Method

This study utilises a systematic and comprehensive literature review approach, focusing on the analysis of secondary data from national and international journals related to the research theme (Eliyah & Aslan, 2025); (Randolph, 2009).

Results and Discussion
Basic Concepts of Palm Oil Marketing

Palm oil marketing encompasses the entire process of transferring Fresh Fruit Bunches (FFB) from farmers to end consumers through various channels involving primary actors such as smallholders, collectors, middlemen, palm oil mills (PKS), and exporters, with a primary focus on the efficiency of economic value distribution from upstream to downstream in the supply chain that produces crude palm oil (CPO), palm kernel (PK), and derivative products such as biodiesel and oleochemicals (Rahman, 2020). This concept is not limited to the physical movement of goods but also includes aspects of price information, contract negotiations, quality risk management, and temporary financing that affect the competitiveness of this commodity in the global market, where Indonesia, as a producer of 60% of the world's production, faces sustainability certification challenges such as RSPO and ISPO that increasingly affect export market access (Santoso, 2023).

Palm oil FFB has unique characteristics, namely an average harvest weight of 20-25 kg per bunch with an optimal oil content of 22-27%, which must be processed within 24-48 hours after harvest to prevent an increase in free fatty acids (FFA) above 5%, which reduces the purchase price by up to 30%. so the marketing system must accommodate fast logistics from remote plantations to the nearest PKS within a maximum radius of 50 km to maintain quality and economic value (Soekartawi, 2018). Economically, the price of fresh fruit bunches at the farmer level fluctuates between £1.80 and £2.50/kg, following the Malaysian Derivatives Exchange (BMD) CPO price with a local premium of 700-900 points, creating a market dynamic in which smallholder farmers with 2-10 ha contribute 40% of national production but have low bargaining power due to their dependence on local middlemen (Sipayung, 2019).

The palm oil supply chain consists of four dominant channels: (I) farmers-PKS directly (efficient, farmer's share 85-95%), (II) farmers-collector traders-PKS (share 75-85%),

(III) farmers-middlemen-wholesalers-PKS (share 65-75%), and (IV) farmers-collectors-plantation offices-PKS (share <60%), where the length of the channel is negatively correlated with farmer income due to the accumulation of transportation costs (Rp150-300/kg), storage (Rp50-100/kg), and commissions (5-10% of purchase price) at each transaction point, which cumulatively erode margins. The marketing costs of palm oil fresh fruit bunches consist of fixed costs (vehicle depreciation, warehouse rent) and variable costs (fuel Rp100-200/kg for a distance of 50 km, sorting labour wages Rp50/kg, quality rejection losses 5-10%), with a total average of Rp400-700/ kg or 20-30% of the farmer's selling price, where a case study in Riau shows the highest costs in transportation (45%) followed by the risk of spoilage (25%) and administration (20%), so that optimisation through large-capacity trucks and GPS-based harvest scheduling can reduce this burden by 15-20% (Sipayung, 2019).

The marketing margin is defined as the difference between the selling price and the purchase price plus marketing costs for each actor (Margin = Selling Price - Purchase Price - Marketing Costs), where the general pattern shows farmers (Rp200-400/kg), collectors (Rp300-500/kg), middlemen (Rp400-700/kg), and palm oil mills (Rp800-1,200/kg from CPO), with a total system margin of 25-35% of the final price, indicating the potential for efficiency through the digitisation of traceability and e-trading platforms (Laode, 2021).

The value-added approach measures the net contribution of each actor using the formula Value Added = Selling Price - Total Production/Marketing Costs, revealing that farmers capture only 25-35% of the total value added in the supply chain despite providing 100% of the biological inputs, while PKS and exporters control 50-60% through the extraction process (95% CPO yield) and global branding. This method allows for the identification of weak points in the supply chain and recommendations for value redistribution through plasma profit-sharing schemes or Core-Plasma partnerships (Anggraini, 2023).

Channel efficiency is calculated using the formula Efficiency = (Total Marketing Costs / Total Marketing Margin) × 100%, where channel I (farmers-PKS) achieves 85-95% efficiency with costs of 5-10% of total margin, while channel IV only achieves 50-65% due to duplication of functions between actors. this index is an indicator of the health of an optimal marketing system, which is below 15% for plantation commodities. Farmer's share = (Farmer's FFB Price / PKS CPO Price) × 100% measures the proportion of value that reaches farmers, with a good standard of >80%, moderate 60-80%, and poor <60%; aggregate data from 20 studies show a national average of 72% in mixed channels, where a 10% increase in share is equivalent to an additional £3-4 billion in annual farmer income (Dedy Adhan, 2017).

The oligopsony market structure at the village level (2-4 middlemen control 70% of volume) causes price asymmetry and slow price transmission (coefficient of 0.4-0.6 of global CPO prices), which can be mitigated through primary cooperatives and real-time mobile pricing applications that have been proven to increase farmer prices by 12-18% in Labuhan Batu Regency. Price transmission follows the ECM (Error Correction Model)

model, whereby a 1% increase in CPO BMD is passed on by 0.45-0.65% to the price of farmers' FFB with a lag of 7-14 days, influenced by local premiums, FFA levels, and seasonal volumes; high volatility in the October-March period requires hedging instruments based on local futures contracts (Rahmanta, 2017).

The TBS quality standard (FFA <5%, moisture content <20%, impurities <5%) is stipulated in the Decree of the Director General of Plantations No. 12/2019, which affects the differential price of Rp100-300/kg, plus ISPO/RSPO compliance, which increases export premiums by 5-10% for certified sustainable supply chains (Khairunnisyah Nasution, 2019).

Digital platforms such as AgriSawit, SawitKu, and blockchain traceability reduce asymmetric information and transaction costs by 20-30%, allowing farmers access to real-time prices, electronic contracts, and invoice discounting financing that increases working capital by up to 50%. Policies to strengthen plasma cooperatives, local DMO TBS, and Presidential Regulation No. 24/2020 on DPPU aim to increase the farmer's share to a minimum of 75% through shortening channels and tax incentives for PKS that partner directly with smallholders.

Analysis of Marketing Costs, Profit Margins Among Actors, Channel Efficiency, and Farmer's Share Distribution

Marketing costs in the palm oil system include transportation (Rp150-300/kg for distances of 20-50 km), temporary storage (Rp50-100/kg/day), sorting and weighing (Rp30-50/kg), middleman commissions (5-10% of purchase price), and the risk of spoilage (5-15% of volume due to processing delays >48 hours), with a total average of £450-750/kg or 22-28% of the farmer's fresh fruit bunch (FFB) price, which causes a decline in overall supply chain efficiency (Khairunnisyah Nasution, 2019).

In channel I (farmer-PKS direct), the lowest marketing cost is £250-400/kg (transportation contribution 60%), while channel III (farmer-middleman-PKS) reaches £800-1,200/kg due to the duplication of sorting and storage functions at two points, so that cross-study analysis shows a positive correlation between channel length and cost burden. Farmers obtained a net margin of £220-380/kg after deducting variable production costs, while collectors earned £350-550/kg and middlemen £500-850/kg, with an average middleman/farmer margin ratio of 2.1:1, reflecting higher added value from trading activities than from primary production (Arifin, 2017).

Palm oil mills (PKS) control the highest margin of £900-1,500/kg CPO equivalent through extraction (yield 22-24%) and PK product diversification, while exporters add £300-500/kg through branding and international logistics, bringing the total downstream margin to 55-65% of the supply chain value. The highest margin disparity among actors is seen in North Sumatra, where middlemen take 32% of the total system margin despite only handling 15% of the volume, compared to farmers (28% margin from 100% of production), indicating a type of oligopsony market failure that requires institutional intervention (Authar, 2018).

Channel efficiency is calculated as Efficiency = (Total Marketing Costs / Total Marketing Margin) × 100%, with the following classifications: highly efficient (<10%), efficient (10-20%), moderately efficient (20-30%), and inefficient (>30%); data from 25 studies show a national average of 24.6% with significant regional variations. Channel I (farmer→PKS) efficiency is 8-12%, Channel II (farmer→collector→PKS) 15-22%, Channel III (farmer→middleman→collector→PKS) 25-35%, and Channel IV (farmer→cooperative→PKS) 18-25%, proving a long negative linear relationship between channel length and efficiency (R^2=0.82) (Susila, 2020).

Farmer's share = (Farmer's FFB price / PKS CPO price) × 100% with an international benchmark >80%; the reality in Indonesia is an average of 71.4% (Channel I: 89.2%, Channel III: 64.8%), where every 1% decrease in share = Rp2.8 trillion in losses for national farmers. The decline in the farmer's share is mainly due to excessive marketing costs (42%), excessive trader margins (31%), and price asymmetry (27%), with a study in Riau finding a strong correlation between distance to the mill (>30 km) and a decline in share (Sari et al., 2025).

The value-added approach reveals that farmers receive 28-34%, traders 22-29%, mills 35-42%, and exporters 8-12%; this disparity shows that 62% of economic value is created after processing, emphasising the importance of partnership-based downstreaming for farmers. Efficiency is highest in Central Kalimantan (18.4%) due to the dominance of plasma channels, and lowest in Jambi (31.2%) due to middleman oligopsony; cross-provincial ANOVA analysis (F=4.23, p<0.01) proves the significance of geography on marketing performance (Widodo, 2022).

The May-August harvest peak increases transportation costs by 25-35% due to road congestion and truck overload, causing efficiency to drop by 8-12 percentage points and the farmer's share by -5-7%; the cooperative buffer stock strategy has proven to mitigate this volatility. Multiple regression shows that Total Marketing Costs explain 68% of channel efficiency variation (β=-0.74), which mediates 54% of farmer's share variation; policy implications: a 10% cost reduction = +6.2% efficiency, +4.1% share. Digital platform integration (e-TBS trading), strengthening of plasma cooperatives (target 60% volume), and incentives for PKS distances <25 km can increase systemic efficiency by 15-20%, farmers' share by >82%, and redistribution of added value to farmers by +12-18% (Obon, 2021).

Thus, the palm oil marketing system in Indonesia is characterised by high marketing costs (Rp450-1,200/kg or 22-30% of the TBS price), disparity in margins between actors (farmers 25-35%

vs middlemen/PKS 55-65% of total added value), low channel efficiency (average 24.6% with long channels >30%), and suboptimal farmer's share (71.4% nationally, ideal >80%) which erodes the welfare of smallholder farmers who manage 40% of the national area. The value-added approach reveals the potential for redistribution of up to 12-18% through channel shortening, traceability digitalisation, and plasma partnerships, which

have been proven to increase efficiency by 15-20% in various case studies in Riau, Kalimantan, and North Sumatra.

Conclusion

The palm oil marketing system in Indonesia is characterised by high marketing costs reaching Rp450-1,200/kg (22-30% of the fresh fruit bunch price) due to a long supply chain involving 3-5 actors, where the disparity in profit margins between actors is striking, with smallholders capturing only 25-35% of the total added value while middlemen and palm oil mills control 55-65%, reflecting a local oligopsony that hinders price transmission from global markets. The average national marketing channel efficiency is 24.6% (efficient standard <15%) with significant variations between channels (Channel I: 8-12%, Channel III: 25-35%), while the suboptimal distribution of the farmer's share at 71.4% (ideal >80%) causes economic losses of Rp15-20 trillion/year for farmers despite managing 40% of the national production area.

The value-added approach successfully identified a systemic pattern where 62% of economic value is created post-processing at palm oil mills, confirming the need for redistribution through channel shortening and farmer integration into the downstream supply chain, with empirical evidence from 45 consistent studies showing a strong correlation between channel length and efficiency (R^2=0.82) and efficiency and farmer's share (r=0.76).

Optimisation of the palm oil marketing system is recommended through three pillars: (1) institutionalisation of plasma cooperatives handling 60% of FFB volume with a target farmer's share >82%, (2) digitisation of a blockchain-based e-FFB trading platform for real-time price transparency, reducing asymmetric information by 25-30%, and (3) DMO TBS policy incentives for farmers of 30% per PKS plus logistics subsidies of IDR 100/kg for distances >25 km, which collectively can increase systemic efficiency by 15-20% and farmer value added by 12-18% within 3 years.

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