

Supply Chain Of Fresh Fruit Bunches From Independent Oil Palm Farmers

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Abstract.

The purpose of this research is to determine the supply chain losses caused by fluctuations in the selling price of Fresh Fruit Bunches (FFB). The method used is to conduct direct surveys with palm oil Fresh Fruit Bunch (FFB) traders and end consumers at Palm Oil Mills in nine sub-districts in Labuhanbatu Regency. The planned number of samples to be interviewed is 800 respondents, consisting of 784 Collecting Traders and 16 SMEs, with a total of 256 respondents successfully interviewed. The research results explain the factors influencing the fluctuation of TBS purchase prices at the supplier level, namely the lack of transparency in TBS selling prices from Palm Oil Mills to traders and from traders to farmers. The findings also suggest that the local government should establish a special institution that can provide information on palm oil prices released by the government through the North Sumatra industry office. In addition, we recommend that the North Sumatra government involve district governments and other stakeholders in the context of the triple helix in sustainable development, considering the imbalanced needs and productivity in implementing national strategic programs. The next research question is about the sustainability of small-scale oil palm farmers, considering the continuous growth of oil palm. Policymakers in key stakeholder institutions need to design strategies to manage global disruptions in palm oil trade, particularly by involving farmers in national strategic programs, one of which focuses on concentrating development on palm oil downstreaming.

Keywords: Price Fluctuations, Supply Chain and Fresh Fruit Bunches.

I. INTRODUCTION

This research is motivated by the vulnerability of the selling price of Fresh Fruit Bunches (FFB) which tends to be unstable and varies in acceptance by oil palm farmers from distributors in Labuhanbatu Regency. Results of the study by M.H. Dar, S. Sarkum, A.P. Nasution, N.E. Mustamu [1], This phenomenon occurs because farmers do not receive clear information about the market price of Fresh Fruit Bunches (FFB) of palm oil concretely at the time of harvesting. On the other hand, the supply chain is vulnerable to losses due to price fluctuations and the decline in the quality of Fresh Fruit Bunches (FFB) because of shrinkage, which reduces yield. Price fluctuations are based on price formation and for commodity prices as described by Pohan [2], that the determination of prices in the international market affects the market mechanism in a country, while the price of Fresh Fruit Bunches (FFB) is based on the determination of domestic Crude Palm Oil (CPO) prices and is not unaffected by the influence of the international market mechanism. In Indonesia, the determination of FFB prices has been formulated through the Guidelines for the Determination of Fresh Fruit Bunch Prices for Palm Oil Farmers [3], which explains in article 7 paragraph (3) that the fixed price is at the level of the Palm Oil Processing Factory (palm oil mill). Thus, it can be inferred that the possibility of price transmission may occur between the Palm Oil Processing Plant (palm oil mill) and the supply chain in profit-sharing.

Tety, Maharani, & Deswita, expressed [4], generally, the price transmission process from the consumer market to the producer market is imperfect and asymmetric, meaning that if there is a price increase in the consumer market, the price increase is passed on to farmers slowly and imperfectly, conversely, if there is a price decrease [5]. The process of transmission patterns occurs because consumers have market power. In addition, price transmission can also occur due to perishable goods and storage [6]. This can happen due to the quality of the Fresh Fruit Bunches (FFB) and the storage process in the supply chain, which can lead to a decrease in FFB yield, resulting in the risk of losses from falling prices [7].

Specifically, one of the factors that influence the purchase price of FFB according to Wulandari & Salman [8], influenced by the patron-client relationship (touke-farmer) where the farmer has a dependency relationship with their touke. Unlike Pratama, Eliza, & Tety [9], which states that the unstable production of Fresh Fruit Bunches (FFB) domestically is one of the causes of price fluctuations at the farmer level, the demand for kernels and crude palm oil (CPO) by companies in the global market followed by government decisions that restrict CPO [10]. Meanwhile, the research results of Yeni.R & Girsang [11], stating that prices may fluctuate due to the distance of FFB purchases from the palm oil mill.

Fluctuations in FFB prices can also occur due to price transmission carried out by the supply chain as collecting traders transform FFB prices by transmitting prices from the palm oil mill [9]. This could be due to the high costs of marketing functions, resulting in different offers from the distributors [7]. Due to the marketing element in the purchase of FFB, there is a profit-sharing (share margin) and marketing costs are one of the components of marketing that affect the level of profit [9]. The descriptions from the research suggest that one of the factors causing fluctuations in FFB prices is influenced by the marketing functions carried out by FFB distributors. In previous research by several authors who conducted studies on the FFB supply chain in Indonesia, there are differing opinions and analyses according to the location and place of the study. Similarly, the profit distribution in carrying out the marketing function in the supply chain marketing operations shows the same. Some of these studies can be seen in Table 1.

Table 1. Differences in research results on profit distribution

Publishing	Author	Marketing Channel	Share Margin
Journal of Agricultural Economics and Development	Noor [12]	1. Farmers→ Cooperative→ Palm Oil Mill 2. Farmers→Collector Trader→ Palm Oil Mill	1. The average margin share of 78.69% is received by farmers. 2. The average margin share of 72.72% is received by farmers.
Pekbis Journal	Tety et al. [4]	Farmers→Collector Trader→Palm Oil Mill	The average marketing margin from the Palm Oil Mill to the farmers is 85.05%.
RAT Journal	Wulandari & Salman [8]	Farmers→Employer→ Palm Oil Mill	The share margin obtained by the farmers is 69.23%.
Magrobis Journal	Nugroho [10]	1. Farmers→Collector→Retailer → Palm Oil Mill 2. Farmers→Collector→Big Retailer→Palm Oil Mill	1. The two-tier marketing channel for farmers is 76.15%. 2. Three-tier marketing channel, the share received by farmers is 73.53%.
Agricultural Scientific Journal	Pratama et al. [9]	Farmers→Collector Trader→Palm Oil Mill	The share margin received by farmers is 73.03%.
Wahana Inovasi: Journal of Research and Community Service UISU	Harahap, Simanullang, & Romadon [13]	1. Farmers→Collector Trader→Big Trader→ Palm Oil Mill 2. Farmers→Big Retailer→Palm Oil Mill	1. The share margin received by farmers is 34.4%. 2. The share margin received by farmers is 37.3%.
Agrica Ekstensia Journal	Rahmanta [14]	1. Farmers→Agent→ Collector Trader→ Palm Oil Mill 2. Farmers→Palm Oil Mill	1. The share margin received by farmers is 72.96%. 2. The share margin received by farmers is 100%.
Journal TABARO Agriculture Science	Sumiati, Rusida, & Idawati [15]	Farmers→Collector Trader→ Palm Oil Mill	The share margin received by farmers is 72%.
AGRARIS: Journal of Agribusiness and Rural Development Research	Sumartono, Badrudin, & Suryanty [16]	1. Farmers→ Collector Trader→ Palm Oil Mill 2. Farmers→ farmers' group→Palm Oil Mill	1. The farmer share value received by farmers is 72.68%. 2. The farmer share value received by farmers is 81.03%.
Agriprimatch	Pinem, Safrida, & Nasution [17]	1. Farmers→ Palm Oil Mill 2. Farmers→ Small Agent→Big Agent→Palm Oil Mill	1. Farme'r Share is 100%. 2. Farme'r Share is 80%.

From the results of the research differences in table 1, it can be seen that the profit distribution carried out by the distributors averages 76%. Meanwhile, the lowest profit distribution from the marketing channel is in the marketing channel Farmer→Collector Trader→Big Trader→ Palm Oil Mill, amounting to 34.4%, located in Meranti Paham Village, Panai Hulu District, Labuhanbatu Regency. Meanwhile, for the FFB marketing channel system, most prefer the two-tier marketing channel, namely Farmer→Collector Trader→ Palm Oil Mill. The differences in the research presented in Table 1 explain that the profit distribution carried out by the distributors is one of the factors influencing the price fluctuations of FFB. Therefore, it is necessary to determine the extent of price transmission that occurs between the Palm Oil Mill and the distributors; then, what factors constitute the costs in the marketing function; and how much profit sharing should be conducted by the distributors. From the description of previous studies, we conclude that the factors influencing the fluctuation of CPO prices are price transmission, marketing functions, and share margins. therefore, the objective of this research is to examine the factors that influence the fluctuations in the purchase price of Fresh Fruit Bunches (FFB) at the distributor level. In addition to the main objective, the other aim of the research is to determine whether there are other factors, namely: a) Travel distance; b) Supply and demand; c) Quality of Fresh Fruit Bunches (FFB) and yield; d) Import policies of countries that import palm oil; e) Changes in tax policies and export/import levies [18].

II. METHODS

This research took samples and conducted direct surveys with palm oil Fresh Fruit Bunch (FFB) traders in nine districts of Labuhanbatu Regency. As is known, Labuhanbatu Regency is one of the central palm oil producing regencies in North Sumatra. The research method was conducted through direct observation via interviews and questionnaires. The selection of respondents was carried out using purposive sampling technique. In addition to traders as samples, this research also observes the process flow directly to the end consumers of the palm oil mill [19, 16]. Meanwhile, the planned number of samples to be interviewed is 800 respondents, consisting of 784 Collecting Traders and 16 SMEs, as shown in Table 2.

Price transmission analysis is tested to understand the market picture between the producer and consumer levels [20]. In this study, price transmission analysis is measured to observe the relationship between price elasticity at the SME level and price elasticity at the Trader level. The formula used according to George & King [21] is $n = \frac{dPr}{dPf} \cdot \frac{Pf}{Pr}$; Explanation: n = price transmission elasticity; Pr = price at the Palm Oil Mill level; Pf = price at the collector trader level; dPr = price change at the Palm Oil Mill level; dPf = price change at the collector trader level. Meanwhile, to determine the magnitude of the costs incurred in the marketing function, a qualitative assessment of the incurred costs is conducted, as well as other factors that influence the fluctuation of FFB prices [22]. Meanwhile, to calculate the share margin, the formula used is: $MP = Pr - Pf$. Explanation: MP = Marketing Margin (Rp/kg) Pr = Factory level price (Rp/kg) Pf = Price at the level of collecting traders/farmers (Rp/kg) [20]

III. RESULT AND DISCUSSION

The Collector Trader is part of the FFB marketing channel that conducts business activities between producers and consumers. The function of the collector traders as a marketing channel plays a very important role, especially in observing the price levels of the collector traders as part of the marketing institution [4]. Collector traders play a role in the dissemination of information by providing signals about the fluctuations in FFB prices, which may or may not be transmitted accurately to farmers [23]. The existence of collectors emerged in the FFB trading business due to the opportunities provided by consumers for collectors to obtain FFB to meet consumer needs. The collecting traders receive compensation from consumers in the form of a marketing margin [20]. Labuhanbatu Regency, which is divided into nine sub-districts, has a total area of 34,339 hectares of people's plantations [24]. It is highly potential for distributor traders to develop their business, as shown in the distribution in Table 2.

Table 2. The number of traders and Palm Oil Mill as well as the average FFB production in Labuhanbatu

No	Marketing Location (Subdistrict)	Marketing Average Production of People's Plantations (Year/Ha/Kg)	Collector Trader	Palm Oil Mill
1	Bilah Barat	3.892.058	80	-
2	Bilah Hilir	3.961.278	104	7
3	Bilah Hulu	4.503.015	192	4
4	Pangkalan	3.242.943	56	3
5	Pantai Hilir	2.157.249	64	-
6	Pantai Hulu	3.088.139	56	1
7	Pantai Tengah	3.746.507	80	-
8	Rantau Utara	3.195.278	80	1
9	Rantau Selatan	4.377.627	72	-

After conducting a survey of traders and SMEs, 256 or 32% of the total planned respondents were successfully interviewed.

Price Transmission

The research results show that the price transmission elasticity measured from the price and changes at the Palm Oil Mill and collector trader levels indicates that the FFB price transmission elasticity value is 1.67; thus, the FFB demand elasticity shows a value greater than 1, meaning that the demand for FFB is elastic where the quantity of FFB demanded is greatly influenced by the price level. However, price changes at the consumer level are not perfectly transmitted to producers.

Marketing Function

The functions of marketing according to Asmarantaka in Tambunan & Ratna [22] can be classified into three basic functions, namely: transaction function (purchase and sale), physical function (transportation and warehousing), and supporting function (grading, financing, risk bearing, and market information). From all the indicators of the marketing functions, the traders impose a fee of 13%, which can be seen in Table 3.

Table 3. Costs, Marketing Margins, and Efficiency in Labuhanbatu in 2018

No	Marketing Institutions and Margin Components	Amount (Rp/Kg)	Persent (%)
1	Collector Trader	1000	83%
	a. Purchase price	150	13%
	b. Marketing Costs	50	4%
	c. Profit	1200	17%
	d. Selling price	2.157.249	64
2	Palm Oil Mill	3.088.139	56
	a. Purchase price	1200	20%
	b. CPO Selling Price	6000	80%

Statistical news In January 2025 [25], the year-on-year change in the National General Wholesale Price Index (IHPB) was 2.11 percent. Several commodities that experienced year-on-year (y-on-y) price increases in January 2025 include palm oil (FFB) and cooking oil. Report by D. Rsimayeti in Bisnis [26], the increase in the price of FFB palm oil for farmers in North Sumatra during this period is the first in 2025 after continuously declining since mid-December 2024. Market Analyst from the Plantation and Livestock Service of North Sumatra Province (Disbunak Sumut) Dewiana stated that during this period, the price of Fresh Fruit Bunches (FFB) for partner farmers in North Sumatra for plants aged 10-20 years is set at Rp3,412.42 per kg, up from last week's price of Rp3,329.65. The determination of the FFB price for Sumut partner farmers is based on prices obtained from several reference markets such as the Palm Oil Marketing Center of PT. Perkebunan Nusantara (PT KPBN), GAPKI, and the CPO market price. The average price of local and export CPO this week is Rp.13,972.34 per kg, an increase of approximately Rp.466 per kg. The next research question is about the sustainability of smallholder palm oil, given that palm oil continues to develop. Policymakers in key stakeholder institutions need to design strategies to manage global disruptions in palm oil trade, particularly involving farmers in national strategic programs, one of which focuses on the concentration of development on palm oil downstream processing.

IV. CONCLUSION

Based on the findings, the factors influencing the fluctuation of FFB purchase prices at the distributor level are affected by the lack of transparency in FFB selling prices from Palm Oil mills to traders and from traders to farmers. This can be seen from the significant price difference between the sale of CPO from FFB processing and the purchase price of FFB. Other factors that fall under marketing function costs do not influence, such as travel distance, demand and supply, FFB quality, and yield, as well as the import policies of countries importing palm oil in accordance with current issues. Likewise, changes in tax policies and export/import levies [18].

The findings suggest that local governments should pay attention to farmers by establishing a special institution that can provide information on current palm oil prices so that the purchasing price at the palm oil mills and the selling price of CPO can be adjusted to the prices set by the government through the North Sumatra plantation office. What is of note is how sustainable the involvement of smallholder oil palm farmers in the national program is, considering that the number of smallholder oil palm plantations is not much different from that of large plantation companies, it's just that independent oil palm farmers are less productive due to various factors. For this reason, we suggest that the North Sumatra government include district governments and other stakeholders in a triple helix context in sustainable development, considering the unbalanced needs and productivity in implementing national strategic programs.

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