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Comparison of Farmers' Term of Trades in the Animal Husbandry and Fishery Subsectors in South Sulawesi

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Abstract

This study aims to analyze the trend of Farmers' Term of Trades in the animal husbandry and fisheries sub-sectors, and to analyze the comparison of Farmers' Term of Trades in the animal husbandry and fisheries sub-sectors in South Sulawesi Province. This study is a type of quantitative research. The type of data is secondary data (monthly time series), obtained from the Central Statistics Agency of Indonesia, from January 2020 to November 2024. Data analysis uses trend analysis and real difference tests (t-tests). The results of this study indicate that the Farmers' Term of Trade (FTT) of the animal husbandry sub-sector in South Sulawesi Province during the period 2020-2024 experienced an increasing trend of 0.2109 per month, so that the level of farmer welfare tended to increase during that period. The Farmers' Term of Trade in the fisheries sub-sector (capture fisheries and aquaculture) also experienced an increasing trend of 0.2556 per month, so that the level of fishermen's welfare also tended to increase during that period. Based on the results of the statistical test (t-test), the comparison of the Farmers' Term of Trade in the animal husbandry and fisheries sub-sectors did not show a significant difference. The FTT of capture fishermen increased by 0.2423 while the FTT of aquaculture fishermen increased by 0.2641. The FTT of capture fishermen is proven to be significantly higher than the FTT of aquaculture fishermen, so that capture fishermen tend to be more prosperous.

Key words: animal husbandry, capture fisheries, aquaculture, Farmers' Term of Trades.

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INTRODUCTION

Farmers' Term of Trade (FTT) is an important indicator used to measure farmer welfare in Indonesia. FTT reflects the comparison between the price received by farmers for agricultural products and the price paid for the goods and services they consume. In the context of agricultural economics, FTT functions as a measure of farmers' purchasing power, which is very important for understanding their socio-economic conditions and formulating appropriate policies to improve their welfare (Andika et al., 2024; Pradana et al., 2020; Ilahi & Agustin, 2022).

The importance of FTT lies not only in its function as an indicator of welfare, but also in its ability to influence farmers' production and investment decisions. When FTT increases, farmers tend to be more motivated to increase their production, because they feel more able to meet their living needs and invest in their agricultural businesses. On the other hand, a decrease in the FTT can cause farmers to experience economic difficulties, which in turn can affect food security and economic stability at the local and national levels (Hasan & Djakaria, 2021; Ediwijoyo et al., 2023; Pangestika & Prihtanti, 2020).

The FTT also serves as a tool to analyze the impact of agricultural and economic policies implemented by the government. By monitoring changes in the FTT, the government can evaluate the effectiveness of programs designed to improve farmer welfare, such as subsidies, training, and access to markets. Research shows that appropriate interventions can increase the FTT and, ultimately, farmer welfare (Heirina & Ayub, 2024; Keumala & Zainuddin, 2018; Arrazy, 2021).

FTT also has broader implications for economic development. The agricultural sector is one of the main pillars of the Indonesian economy, and the welfare of farmers contributes to overall economic stability. When farmers are prosperous, they can contribute more to the local economy through consumption and investment, which in turn can drive economic growth (Maulana, 2022; Hastuti, 2023; Muzaki, 2024).

In order to increase FTT, the government and related institutions need to develop programs that support farmers' access to markets, technology, and information. This includes training in better agricultural practices, access to credit, and support in marketing agricultural products. Thus, FTT can serve as a tool to encourage the growth and sustainability of the agricultural sector in Indonesia (Bachtiar, 2023; Saridewi, 2021; Kinasih & Fisabilillah, 2023).

Overall, FTT is a very important indicator in the context of agriculture and the economy in Indonesia. By understanding and utilizing FTT, various parties can contribute

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to improving farmer welfare and sustainable economic development. Further research and ongoing monitoring of FTT will be essential to ensure that the policies implemented are effective and responsive to farmers' needs (Muzaki, 2024; Jolanda, 2024; Widyaningrum, 2024).

The FTT in South Sulawesi is an important indicator that reflects the welfare of farmers and their impact on the regional economy. With the support of appropriate policies and effective risk mitigation strategies, there is potential to increase the FTT and, in turn, improve the welfare of farmers in South Sulawesi. Based on data from the Central Statistics Agency (BPS) in December 2024, the combined FTT value in South Sulawesi was 121.01. Meanwhile, for each sub-sector, it includes: FTT for food crops of 105.02; FTT for horticultural crops of 125.95; FTT for smallholder plantation crops of 178.24; FTT for animal husbandry of 110.34; and FTT for fisheries of 109.27.

FTT is an indicator that shows farmers' purchasing power, which is calculated based on the comparison between the prices received by farmers for agricultural products and the prices paid for the goods and services they consume. In this context, monitoring FTT is very important to understand farmers' welfare and its impact on food security and economic development in South Sulawesi. This study aims to analyze the trend of Farmers' Term of Trades in the animal husbandry and fisheries sub-sectors, and to analyze the comparison of Farmers' Term of Trades in the animal husbandry and fisheries sub-sectors in South Sulawesi Province.

LITERATURE ANALYSIS AND METHODOLOGY

Literature Analysis

According to the Central Bureau of Statistics of Indonesia, the Farmers' Terms of Trade is the ratio of price received by farmers indices (It) and price paid by farmers indices (Ib). It is an indeces that shows the prices fluctuation of agricultural commodities produced by farmers. Ib is an indeces that shows the price fluctuation of some goods/services for household consumption and production cost. Price received by farmers is the farm gate price which is the average of producer prices of agricultural products by excluding the transportation and packaging costs into the selling prices. The multipication of average price and volume of sale will show total income received by farmer. Price paid by farmers is the average of retail prices of some goods/services needed by farmers, either for household consumption or production process. The price data is collected by interviewing the sellers in selected market.

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Farmers' Term of Trade (FTT) is an important indicator in assessing the welfare of farmers in Indonesia. FTT reflects the comparison between the prices received by farmers from agricultural products and the prices paid for the goods and services they consume. FTT analysis can provide insight into the economic conditions of farmers and its impact on their welfare. A high FTT indicates that farmers have better purchasing power, which contributes to improving their welfare. Conversely, a low FTT may indicate that farmers are experiencing economic difficulties, which can have a negative impact on their quality of life. Research by Patiung shows that fluctuations in agricultural commodity prices greatly affect FTT, which in turn has an impact on farmers' welfare (Andika et al., 2024). This shows the importance of commodity price stability in maintaining farmers' welfare.

The FTT of the animal husbandry subsector in South Sulawesi shows significant fluctuations. According to research by Muslim, the FTT of this subsector is influenced by several factors, including feed prices, production costs, and market demand for animal husbandry products such as meat and milk (Andika et al., 2024). In 2023, the FTT of the animal husbandry subsector decreased due to the increase in feed costs which was not comparable to the selling price of animal husbandry products. This caused many farmers to have difficulty maintaining their purchasing power (Andika et al., 2024; Febrilia & Setiawan, 2023). Research by Febrilia and Setiawan also showed that the FTT of the animal husbandry subsector tends to be lower than other subsectors, reflecting the challenges faced by farmers in this sector (Febrilia & Setiawan, 2023).

The FTT of the fisheries subsector, both aquaculture and capture, shows a more positive trend. Research by Firmansyah and Asriadi noted that the FTT of the aquaculture subsector in South Sulawesi was at a higher figure compared to the animal husbandry subsector, with a value of around 106.94 (Ilahi & Agustin, 2022). This shows that fisheries farmers have better purchasing power, which is influenced by high demand for fishery products and government support in the form of training and access to better cultivation technology (Ilahi & Agustin, 2022; Heirina & Ayub, 2024).

The factors that influence the FTT in these two subsectors are different. In the animal husbandry subsector, the main factors influencing the FTT are feed costs and product selling prices. The increase in feed prices that is not comparable to the selling price of the product causes a decrease in the FTT (Andika et al., 2024; Febrilia & Setiawan, 2023). Meanwhile, in the fisheries subsector, factors such as market demand, technological support, and government policies play an important role in increasing the FTT (Ilahi & Agustin, 2022; Heirina & Ayub, 2024).

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METHODOLOGY

This Farmers' Term of Trade Study covers the area of South Sulawesi Province. This research is a quantitative research. The type of data is secondary data (monthly time series), obtained from the Central Bureau of Statistics of Indonesia, starting from January 2020 to November 2024. Data analysis uses trend analysis and real difference test (t-test). In more detail, the formulas are described as follows.

Trend analysis formula:

Y = a + bX

Y = Farmers' Term of Trade (animal husbandry, capture fisheries, aquaculture fisheries)

a = Constant

b = Regression Coefficient

X = Time (monthly)

Formula t test:

$$t = \frac{X1 - X2}{s\sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

Description:

X_1 = average FTT Animal husbandry

X_2 = average FTT Fisheries

s = combined average variation

n_1 = sample quantity (animal husbandry)

n_2 = sample quantity (fisheries)

H_0 : statistical size = specific value

H_1 : Statistical size ≠ specific values

Test criteria :

If t-stat ≤ t-table, then H_0 is accepted and H_1 is rejected

If t-stat > t-table, then H_0 is rejected and H_1 is accepted

RESULTS AND DISCUSSION

Trend of Farmers' Term of Trade in the Animal Husbandry Subsector

The animal husbandry subsector in South Sulawesi, which includes cattle, goats, and poultry, has a lower FTT compared to other subsectors. This is due to high feed costs and unstable selling prices of animal husbandry products. Research shows that the FTT of the animal husbandry subsector tends to fluctuate, depending on feed availability and

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market demand (Alfi et al., 2023). Efforts to increase the FTT in this subsector include improving feed management and better market access (Alfi et al., 2023).

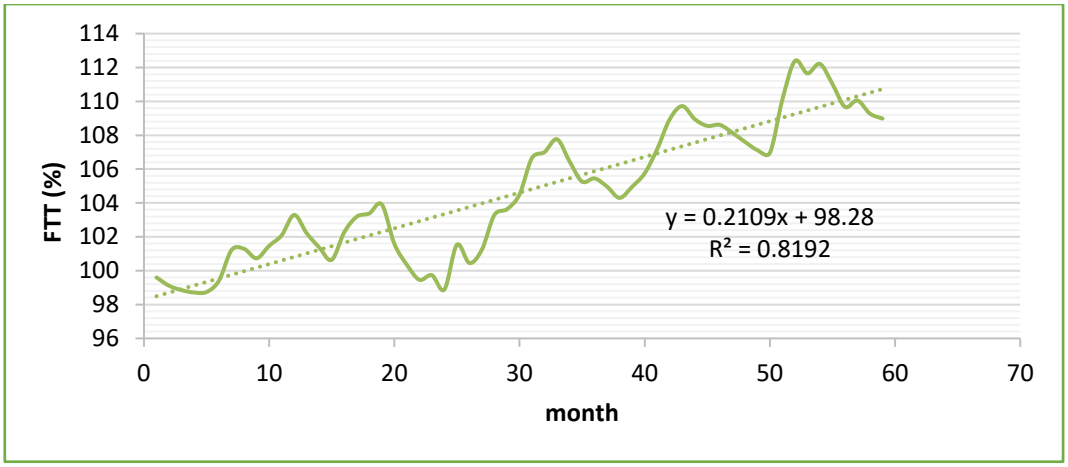


Figure 1. Animal Husbandry FTT Trends in South Sulawesi (2020-2024)

In the animal husbandry subsector, those that are taken into account in FTT include: large liverstock, small animal husbandry, poultry, and animal husbandry products. Animal Husbandry FTT in South Sulawesi during the period January 2020-November 2024 has an average value of 104.61 with a minimum value of 98.71 (April 2020) and a maximum value of 112.38 (April 2024). During this period, the trend value of FTT animal husbandry increased by 0.2109 per month. This shows that the price index received by animal husbandry farmers is higher than the price index paid by animal husbandry farmers, and has tended to increase in the last five years. Thus, the level of welfare of farmers in South Sulawesi has tended to increase in the last five years.

The FTT of the animal husbandry subsector in South Sulawesi showed significant fluctuations. According to research by Muslim, the FTT of this subsector is influenced by several factors, including feed prices, production costs, and market demand for animal husbandry products such as meat and dairy (Andika et al., 2024). In 2023, the FTT of the animal husbandry subsector will decrease due to an increase in feed costs that are not proportional to the selling price of animal husbandry products. This causes many farmers to have difficulties in maintaining their purchasing power (Andika et al., 2024; Febrilia & Setiawan, 2023).

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Trend of Farmers' Term of Trade in the Fishery Subsector

In the Farmers' Term of Trade, the fisheries subsector includes aquaculture and capture fisheries. This FTT trend analyzes the overall fishery trend, as well as the trend of each capture fishery and aquaculture fishery. To see the full picture, it is shown in the following graphic.

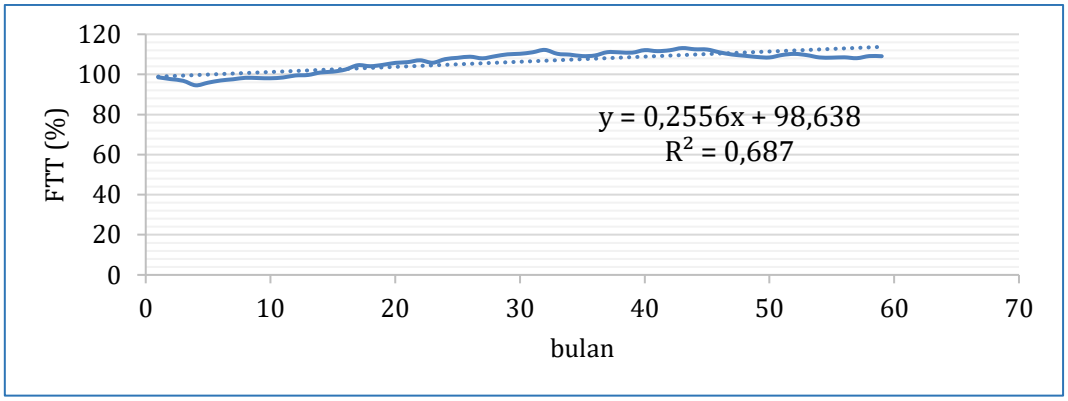


Figure 2. Fishery FTT Trends in South Sulawesi (2020-2024)

The Farmers' Term of Trade in the fisheries subsector in South Sulawesi for the period January 2020-November 2024 has an average value of 106.31 with a minimum value of 94.56 (April 2020) and a maximum value of 113.13 (July 2023). In that period, the trend value of fisheries FTT increased by 0.2556 per month (Figure 2). This shows that the price index received by fishermen is higher than the price index paid by fishermen, and tends to increase in the last five years. Thus, the level of welfare and purchasing power of fishermen in South Sulawesi tends to increase in the last five years.

The Farmers' Term of Trade in capture fisheries in South Sulawesi for the period January 2020-November 2024 has an average value of 107.88 with a minimum value of 95.94 (April 2020) and a maximum value of 114.55 (September 2023). In that period, the trend value of capture fisheries FTT increased by 0.5597 per month (Figure 3). This shows that the price index received by fishermen is higher than the price index paid by fishermen, and tends to increase in the last five years. Thus, the level of welfare and purchasing power of capture fishermen in South Sulawesi tends to increase in the last five years.

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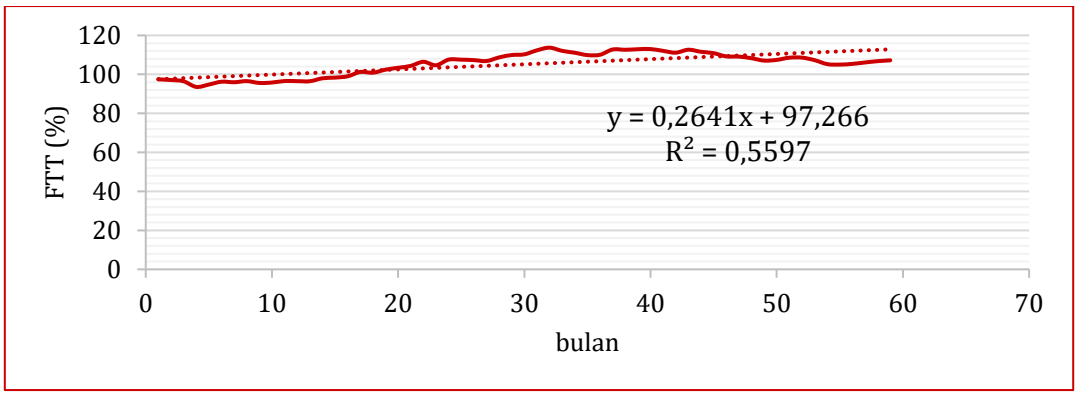


Figure 3. Captured Fisheries FTT Trends in South Sulawesi (2020-2024)

Research shows that the FTT of this subsector is greatly influenced by weather conditions and the availability of fish resources. Firmansyah and Asriadi noted that although there is great potential in this subsector, challenges such as overfishing and climate change can negatively affect FTT. Therefore, it is important to implement sustainable fisheries management practices to maintain the welfare of fishermen and the stability of FTT (Firmansyah & Asriadi, 2022).

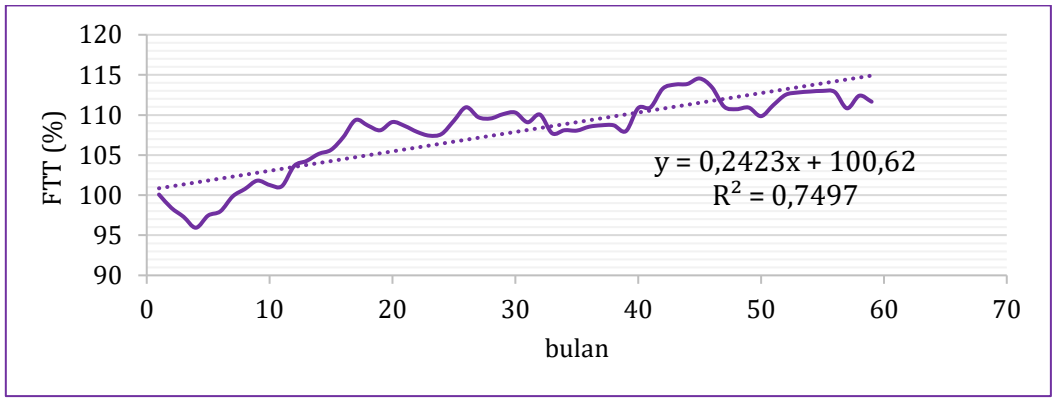


Figure 4. Aquaculture FTT Trends in South Sulawesi (2020-2024)

The Farmers' Term of Trade in aquaculture in South Sulawesi for the period January 2020-November 2024 has an average value of 105.19 with a minimum value of 93.59 (April 2020) and a maximum value of 113.7 (August 2022). In that period, the trend value of FTT in aquaculture increased by 0.2423 per month (Figure 4). This shows that the price index received by aquaculture fishermen is higher than the price index paid by

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aquaculture fishermen, and tends to increase in the last five years. Thus, the level of welfare and purchasing power of aquaculture fishermen in South Sulawesi tends to increase in the last five years.

The FTT of the aquaculture subsector in South Sulawesi shows a positive trend, especially with the increasing demand for fishery products such as catfish and tilapia. Research by Firmansyah and Asriadi (2022) shows that the FTT of this subsector has increased significantly thanks to government support in the form of training and access to better cultivation technology. However, challenges such as fish disease and price fluctuations remain a concern.

Comparison of FTT Animal Husbandry and FTT Fishery

In South Sulawesi Province during the period January 2020-November 2024, the average value of FTT animal husbandry (104.61) was lower than that of FTT fishery (106.31). However, based on the results of the t-test analysis, the comparison of FTT animal husbandry and FTT fishery shows that the two FTTs are not significantly different (t stat < t table). To find out the comparison, you can see Table 1.

Table 1. Comparison of FTT Animal Husbandry and FTT Fishery in South Sulawesi

Subsector	Farmers' Term of Trade (%)	t stat	t table (0,05)
Animal Husbandry	104.6075	-1,965	1,658
Fishery	106.3054		

Source: Secondary data analysis, 2025.

The animal husbandry subsector in South Sulawesi has a lower FTT compared to other subsectors. This is due to the high cost of feed and the selling price of animal husbandry products that are not always stable. Research shows that the FTT of the animal husbandry subsector tends to fluctuate, depending on feed availability and market demand. Efforts to improve FTT in this subsector include improved feed management and better access to markets (Alfi et al., 2023). Research by Febrilia and Setiawan (2023) also shows that the FTT of the animal husbandry subsector tends to be lower compared to other subsectors, reflecting the challenges faced by farmers in this sector.

When comparing the FTT of the animal husbandry and fisheries subsectors, it can be seen that the fisheries subsector has an advantage in terms of purchasing power. Higher fisheries subsector FTT reflects better potential to improve fishers' welfare

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compared to farmers. Research by Zulaika et al. (2024) shows that government policies that support sustainable fisheries management and business partnerships can contribute to increasing FTT in the fisheries subsector. Meanwhile, the animal husbandry subsector still faces significant challenges, especially related to high production costs and fluctuations in feed prices.

Table 2. Comparison of Captured Fisheries FTT and Aquaculture FTT in South Sulawesi

Subsector Fishery	Farmers' Term of Trade (%)	t stat	t table (0,05)
Captured Fisheries	107.8831	2,672	1,658
Aquaculture	105.1907		

Source: Secondary data analysis, 2025.

In South Sulawesi Province, in the period January 2020-November 2024, the average FTT value of capture fishermen (107.88) is higher than the average FTT value of aquaculture fishermen (105.19). Based on the results of the t-test analysis, the comparison was proven to be significant (t stat > t table), meaning that the level of welfare of capture fishermen was significantly higher than that of aquaculture fishermen. This is due to the existence of variable input prices for fish farming which tend to fluctuate and continue to increase. Meanwhile, capture fisheries only require fixed inputs, because it is an extractive agriculture.

The FTT of the fisheries subsector, both aquaculture and capture, showed a more positive trend. Research by Firmansyah and Asriadi noted that the FTT of the aquaculture subsector in South Sulawesi is at a higher rate compared to the animal husbandry subsector, with a value of around 106.94 (Ilahi & Agustin, 2022). This shows that fishery farmers have better purchasing power, which is influenced by high demand for fishery products and government support in the form of training and access to better aquaculture technologies (Ilahi & Agustin, 2022; Heirina & Job, 2024).

CONCLUSION AND RECOMMENDATIONS

The results of this study indicate that the Farmers' Term of Trade (FTT) of the animal husbandry sub-sector in South Sulawesi Province during the period 2020-2024 experienced an increasing trend of 0.2109 per month, so that the level of farmer welfare tended to increase during that period. The Farmers' Term of Trade in the fisheries sub-sector (capture fisheries and aquaculture) also experienced an increasing trend of 0.2556

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per month, so that the level of fishermen's welfare also tended to increase during that period. Based on the results of the statistical test (t-test), the comparison of the Farmers' Term of Trade in the animal husbandry and fisheries sub-sectors did not show a significant difference. The FTT of capture fishermen increased by 0.2423 while the FTT of aquaculture fishermen increased by 0.2641. The FTT of capture fishermen is proven to be significantly higher than the FTT of aquaculture fishermen, so that capture fishermen tend to be more prosperous.

To increase the FTT of the animal husbandry subsector, appropriate interventions from the government are needed, including feed subsidies and farming management training. Meanwhile, support for the fisheries sub-sector must continue to be increased to ensure the sustainability and welfare of fishermen in South Sulawesi Province.

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