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The Impact of Fertilizer Subsidy and Credit Program Policies on Farmers' Well-Being in Southeast Sulawesi

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Abstract

Farmer Exchange Rate (NTP) is one of the indicators used to measure the level of farmers' welfare. Agricultural subsidy policies are expected to improve farmers' welfare through increasing agricultural productivity and farm income. This study aims to: (1) determine the dynamics of the Farmer Exchange Rate in Southeast Sulawesi, and (2) analyze the impact of subsidy policies on the Farmer Exchange Rate in Southeast Sulawesi. This research was conducted from October 2025 to March 2026. The population in this study consisted of all farmers in Southeast Sulawesi, while the samples included the Farmer Exchange Rate (NTP), fertilizer subsidies, and program credit subsidies. This research employed a quantitative descriptive approach using time series data from 2009–2029. Data analysis was conducted using multiple linear regression analysis with the Ordinary Least Square (OLS) method. The results of this study indicate that the effect of fertilizer subsidies and program credit subsidies on farmers' welfare in Southeast Sulawesi is not uniform. Urea fertilizer, organic fertilizer subsidies, and People's Business Credit have a significant effect but tend to reduce the Farmer Exchange Rate, while SP-36 fertilizer subsidies significantly increase the Farmer Exchange Rate. Meanwhile, NPK fertilizer subsidies, and ZA fertilizer subsidies, do not have a significant effect on the Farmer Exchange Rate in Southeast Sulawesi

Keyword: ***Farmer Exchange Rate, Fertilizer Subsidy, Program Credit Subsidy***

INTRODUCTION

The agricultural sector is a strategic sector that plays a vital role in national economic

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development, as it serves as the source of livelihood for the majority of the Indonesian population. In addition to contributing to food security, the agricultural sector also plays a role in creating jobs, reducing poverty, and improving the welfare of rural communities. Therefore, agricultural development is one of the government's priorities in achieving food security and improving farmers' welfare. One indicator commonly used to measure farmers' welfare is the Farmer's Terms of Trade (NTP), which is the ratio of the Farmer's Received Price Index (It) to the Farmer's Paid Price Index (Ib). An NTP above 100 indicates that farmers' income exceeds their expenditures, reflecting an increase in their purchasing power and well-being.

In Southeast Sulawesi Province, the agricultural sector remains the primary source of livelihood for the population, particularly in the subsectors of food crops, horticulture, smallholder plantations, livestock, and fisheries. Data from the Central Statistics Agency (BPS) show that the average NTP for Southeast Sulawesi Province increased from 98.29 in 2020 to 108.90 in 2024. However, this growth was not evenly distributed across all subsectors. The food crops subsector, for example, still had an NTP below 100 during that period, while the smallholder plantation and horticulture subsectors showed relatively higher increases. This situation indicates that improving farmers' welfare still faces various challenges influenced by differences in commodity characteristics, production costs, and access to production inputs.

One of the policies implemented by the government to improve farmers' productivity and welfare is the provision of agricultural subsidies, including both fertilizer subsidies and agricultural business credit subsidies. Fertilizer subsidies aim to reduce production costs by providing fertilizer at affordable prices, while credit subsidies—such as the People's Business Credit (KUR)—aim to expand farmers' access to low-interest financing. These policies are expected to increase productivity and income and, ultimately, improve the Farmers' Terms of Trade (Anugrah, 2022; Haryanto et al., 2023). However, the effectiveness of subsidy policies depends heavily on their targeting accuracy, distribution, and the ease of access farmers experience.

These issues are also still encountered in Southeast Sulawesi Province. Research by Nurlina et al. (2020) indicates that the distribution of subsidized fertilizer in Kendari City has not fully met farmers' needs, as the amount of fertilizer received often does not match the proposals outlined in the Definitive Group Needs Plan (RDKK). Furthermore, limited quotas, distribution delays, and mismatches in the types of fertilizer received lead to increased production costs for farmers, which could potentially reduce their well-being. On the other hand, some farmers also continue to face limited access to business credit due to poor administrative capacity, insufficient collateral, and limited access to formal financial institutions.

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Although the government has allocated a substantial agricultural subsidy budget annually, the increase in the Farmers' Terms of Trade has not fully reflected the effectiveness of these policies. This situation indicates that the size of the subsidy budget does not always translate into improved farmer welfare if program implementation is not optimal. Therefore, evaluating the impact of agricultural subsidies is crucial as a basis for formulating more effective, efficient, and targeted policies.

This study addresses a research gap compared to previous studies. Most prior research has only analyzed the separate effects of fertilizer subsidies or credit subsidies on farmers' productivity and income, whereas this study comprehensively examines the impact of subsidy policies on the Farmers' Terms of Trade (NTP) as an indicator of farmers' welfare at the provincial level. Furthermore, this study utilizes data from Southeast Sulawesi Province, which has received relatively limited attention despite the region's agricultural characteristics differing from those of other areas in Indonesia.

Based on the above, research on the impact of subsidy policies on the Farmers' Terms of Trade in Southeast Sulawesi Province is important to conduct. This study aims to analyze the effect of subsidy policies on the NTP using the Ordinary Least Squares (OLS) approach to obtain empirical evidence regarding the effectiveness of subsidy policies in improving farmers' welfare. The results of this study are expected to serve as evaluation material for the government in formulating agricultural subsidy policies that are more targeted and support the sustainable improvement of farmers' welfare.

METHOD

This study was conducted in Southeast Sulawesi Province from October 2025 to March 2026. The study location was selected through purposive sampling, considering that the agricultural sector is one of the main sectors supporting the local economy in the region. The study employed a quantitative approach using secondary time-series data covering the period 2009–2025. The study population comprised all data on the Farmer's Price Index (NTP), actual fertilizer subsidies, and program credit subsidies in Southeast Sulawesi Province, while the study sample consisted of NTP data, fertilizer subsidies, and People's Business Credit (KUR) for the agricultural sector over a 17-year period. Data were obtained from various official agencies, namely the Central Statistics Agency (BPS), the Ministry of Agriculture, the Ministry of Finance, and other government publications.

The data collection technique employed a documentation method involving the collection, recording, and analysis of various statistical reports and official documents related to

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the study variables. The dependent variable in this study is the Farmer's Price Ratio (NTP) as an indicator of farmer welfare, while the independent variables include the actual amounts of subsidies for urea fertilizer (X_1), NPK (X_2), organic fertilizer (X_3), SP-36 (X_4), ZA (X_5), and the People's Business Credit (KUR) subsidy for the agricultural sector (X_6). Data analysis was conducted using the Ordinary Least Squares (OLS) method to test the effect of fertilizer subsidy and credit subsidy policies on the Farmers' Terms of Trade in Southeast Sulawesi Province.

RESULTS AND DISCUSSION

Farmers' welfare is a key indicator of agricultural sector development, typically measured by the Farmers' Terms of Trade (NTP). The government seeks to improve this welfare through various policies, one of which is the provision of fertilizer subsidies. Fertilizer subsidies are expected to reduce agricultural production costs, thereby increasing farmers' income. Therefore, with government fertilizer subsidies in place, farmers in Indonesia should be able to achieve improved well-being—not the opposite.

This study uses multiple linear regression to determine the impact of fertilizer subsidies and program credit subsidies on farmers' welfare in Indonesia. The multiple linear regression estimation approach involves testing classical assumptions, namely the normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test, as follows

1. The results of the normality test in this study yielded a *Jarque–Bera* statistic of 1.001965 with a probability value of 0.605935. This probability value is greater than the significance level (> 0.05), indicating a significant effect—meaning the data is normally distributed.
2. The results of the multicollinearity test show that the *tolerance* value for the UREA variable (X_1) is 0.683 > 0.10, with a VIF value of 1.463 < 10; therefore, it can be concluded that the UREA variable does not exhibit multicollinearity. Furthermore, the NPK variable (X_2) has a tolerance value of 0.750 > 0.10 and a VIF value of 1.333 < 10, indicating that the NPK variable also does not exhibit multicollinearity. The organic fertilizer variable (X_3) has a tolerance value of 0.111 > 0.10 and a VIF value of 8.990 < 10, so it remains within acceptable limits and does not exhibit multicollinearity. Similarly, the SP-36 variable (X_4) has a tolerance value of 0.114 > 0.10 and a VIF value of 8.735 < 10, and the ZA variable (X_5) has a tolerance value of 0.163 > 0.10 and a VIF value of 6.142 < 10; both indicate the absence of multicollinearity. Furthermore, the KUR variable (X_6) has a *tolerance* value of 0.589 > 0.10 and a VIF value of 1.699 < 10, so it also does not exhibit multicollinearity. Thus, all independent variables in this study do not have multicollinearity issues and are suitable for use in the regression model

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3. The results of the heteroscedasticity test using the *Breusch–Pagan–Godfrey test* in this study show an F-statistic probability value of 0.480 > 0.05, indicating that, overall, the independent variables do not affect the residual variance; thus, there is no indication of heteroscedasticity in the model. Furthermore, the probability value for *Obs*R-squared* is 0.3863 > 0.05, meaning that based on the *Chi-Square* test, the regression model does not exhibit heteroscedasticity and the residual variance is constant. Additionally, the probability value for *Scaled Explained* SS of 0.8377 > 0.05 further reinforces that there is no issue of heteroscedasticity in the regression model used.
4. The results of the autocorrelation test using *the Breusch–Godfrey Serial Correlation* LM Test in this study show an F-statistic probability value of 0.7449 > 0.05, indicating that, overall, the regression model does not exhibit autocorrelation; thus, the independent variables in the model do not cause correlation in the residuals. Furthermore, the *probability* value for *Obs*R-squared* is 0.5470 > 0.05, meaning that based on the *Chi-Square* test, the regression model does not exhibit autocorrelation up to the second lag; thus, the residuals in a given period are not correlated with the residuals in the previous period. Both results indicate that the null hypothesis ($_{H_o}$),which states that there is no autocorrelation in the model, cannot be rejected; thus, the regression model is deemed free of autocorrelation.
5. The coefficient of determination, or R-squared (R^2), in this study is 0.857, which indicates that the independent variables—comprising urea fertilizer (X_1), NPK fertilizer (X_2), organic fertilizer (X_3), SP-36 fertilizer (X_4), ZA fertilizer (X_5), and People's Business Credit (X_6) are able to explain 85.7% of the Farmers' Exchange Rate (Y), while the remaining 14.3% (100% – 85.7%) is influenced by other variables not included in this study's model
6. The *F-statistic* value of 9.994 indicates that the regression model used effectively explains the relationship between the independent variables and the dependent variable. This is also supported by the *Sum of Squares for Regression* value of 695.955, which is greater than *the Sum of Squares for Residuals* of 116.050; this means that most of the variation in the Farmers' Terms of Trade can be explained by the variables in the model, while the remainder is influenced by other factors outside the scope of this study.

The t-test aims to determine the magnitude of the effect of each independent variable on the dependent variable, while holding the other dependent variables constant. *The t-test* is conducted by comparing the *t-statistic* value with the critical t-value.

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Table 1. The Impact of Fertilizer Subsidy and Program Credit Subsidy Policies on Farmer Welfare in Southeast Sulawesi

No	Source of Variation	Coefficient	t-Statistic	Prob.
1	C	927.737	5.654	0.002
2	UREA	-0.388	-4.204 ***	0.001
3	NPK	-0.007	-0.349 ts	0.735
4	ORGANIC FERTILIZER	-0.072	-3.700 ***	0.004
5	SP-36	0.898	2.427 **	0.036
6	ZA	-0.621	-1.773 ts	0.107
7	KUR	-0.029	-2.080 *	0.064
R-squared: 0.857		*F-statistic*: 9.994		

Note: ***= significant at 1%; **= significant at 5%; *= significant at 10%; ts= not significant

Based on Table 1, the impact of fertilizer subsidy and program credit subsidy policies on the welfare of farmers in Southeast Sulawesi can be explained as follows:

Farmers' Terms of Trade (Constant)

The Farmers' Terms of Trade as a constant variable (*C*) has a t-statistic value of 5.654388 with a probability value of 0.0002, which is smaller than the significance level α = 0.05. Thus, $H_0$is rejected and $H_1$is accepted, indicating that the constant has a significant effect on the regression model. This suggests that there are other factors beyond the variables UREA, NPK, PO, SP36, ZA, and KUR that significantly influence the dependent variable. This indicates that even in the absence of the effects of fertilizer subsidies and program credit subsidies, farmers' welfare (as measured by the NTP) still maintains a sufficiently high baseline value.

The significance of this constant also indicates that there are other factors outside the research model that tangibly influence farmers' welfare. These factors may include agricultural commodity prices, production costs, land area, productivity levels, climatic conditions, market access, other government policies, and the socioeconomic characteristics of farmers. In other words, the fertilizer subsidy and program credit subsidy variables used in this study are not fully capable of explaining the overall variation in farmers' welfare.

The high value of the constant term indicates that farmers' welfare does not depend entirely on subsidy policy interventions but is also influenced by the dynamics of the agricultural sector itself. This is consistent with the concept of the Net Farm Income (NTP) as a welfare indicator that reflects the ratio between the prices farmers receive and the prices they pay.

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Therefore, even in the absence of effects from fertilizer and credit program subsidies, farmers still enjoy a certain level of welfare derived from their production activities and other economic factors.

Urea Fertilizer Subsidy (X_1)

The results of the significance test for the urea fertilizer subsidy variable indicate that the UREA variable has a *t-statistic* value of -4.203841 with a probability value of 0.001, which is smaller than the 1% significance level ($\alpha = 0.01$). Thus, the urea fertilizer variable has a significant effect on the NTP at a 99% confidence level. The regression coefficient of -0.388 indicates that every 1-kilogram increase in urea fertilizer subsidies reduces farmers' NTP by 0.388%. A negative coefficient suggests that increased use of urea fertilizer has not yet improved farmers' welfare in Southeast Sulawesi Province.

These results suggest that increased use of urea fertilizer does not always have a positive impact on farmers' welfare. A study by the Ministry of Agriculture on excessive fertilizer use in rice farming also shows that more than 50% of farming households in Indonesia use urea in excess and that long-term overuse can reduce soil fertility. Furthermore, according to the Ministry of Agriculture (2021), the majority of farmers in Indonesia still use urea fertilizer excessively, which, in the long term, leads to a decline in soil fertility. On the other hand, the ineffectiveness of subsidies may also be due to uneven and misdirected distribution, as noted by Nesha and Rika (2025), who state that fertilizer subsidies often fail to have a significant impact on farmers' well-being due to issues with distribution and fertilizer quality.

NPK Fertilizer Subsidy (X_2)

The results of the significance test for the NPK fertilizer subsidy variable show that the NPK variable has a *t-statistic* value of -0.349 with a probability value of 0.735, which is greater than the significance level. Therefore, the decision is to accept H_0 and reject H_1, meaning that the NPK fertilizer subsidy variable does not have a significant effect on the Farmers' Terms of Trade (NTP).

The negative effect of NPK fertilizer on the Farmers' Terms of Trade (NTP) can be explained by the fact that fertilizer use is not always efficient. Theoretically, this condition can be explained by the principle *of diminishing returns*, whereby once fertilizer application exceeds the optimal dose, additional inputs no longer significantly increase yields and may even increase production costs; this is supported by research (Pusparini *et al.,* 2018) showing that NPK fertilizer application rates do not increase corn yields per hectare, indicating that fertilizer effectiveness

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depends heavily on application rates, soil conditions, and crop needs. These findings are consistent with research (Musyarrofah *et al.,* 2025), which states that the maximum retail price (MRP) of partially subsidized fertilizer does not have a significant effect on the net farm income (NFI) from rice; thus, changes in policy or the price of subsidized fertilizer do not always directly translate into improved farmer welfare.

Organic Fertilizer Subsidy (X_3)

The results of the significance test show that the organic fertilizer subsidy variable (X_3) has a *t-statistic* value of -3.700 with a probability value of 0.004, which is smaller than the 1% significance level (0.01); therefore, the organic fertilizer variable has a significant effect on the NTP at a 99% confidence level. The regression coefficient of -0.072 indicates that every 1-kilogram increase in the use of organic fertilizer subsidies will reduce farmers' NTP by 0.0725%, assuming all other variables remain constant. A negative coefficient suggests that increased use of organic fertilizer has not yet been able to directly improve farmers' welfare in Southeast Sulawesi Province.

Theoretically, these results can still be explained. Organic fertilizer does play a role in improving the physical, chemical, and biological properties of the soil and supporting sustainable productivity, but its benefits tend not to be immediate and are highly dependent on the quantity, quality, and continuity of its use. Therefore, in the short term, additional organic fertilizer does not necessarily immediately increase crop yields or farmers' income; this finding aligns with Gustaman (2026), who states that organic fertilizer plays a greater role in gradually improving soil fertility and does not directly impact farmers' income in the short term. Furthermore, according to Sutanto (2002), organic fertilizer primarily serves to improve the physical, chemical, and biological properties of the soil; however, its effects are long-term and thus do not always result in immediate increases in production.

Thus, the negative coefficient for organic fertilizer indicates that, although statistically significant, its benefits for farmers' welfare are not yet optimal due to limitations in short-term effectiveness and rising production costs. Thus, the negative coefficient for organic fertilizer indicates that, although statistically significant, its benefits for farmers' welfare are not yet optimal due to limitations in short-term effectiveness and rising production costs.

SP-36 Fertilizer Subsidy (X_4)

The results of the significance test show that the SP-36 fertilizer subsidy variable (X_4) has a *t-statistic* value of 2.427 with a probability value of 0.036, which is smaller than the 5%

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significance level (0.05); thus, the SP-36 fertilizer variable has a significant effect on farmers' welfare at a 95% confidence level. The regression coefficient of 0.898 indicates that every 1-kilogram increase in the use of the SP-36 fertilizer subsidy will increase farmers' NTP by 0.898%, assuming all other variables remain constant. A positive coefficient indicates that increased use of SP-36 fertilizer can improve farmers' welfare in Southeast Sulawesi Province. This suggests that fertilizer subsidies are not merely a matter of whether they work or not, but rather which type of fertilizer is truly suited to the limiting factors of production in the field. SP-36 is a phosphate fertilizer; phosphorus is essential for root development, flowering, and grain filling. According to Kaya (2005), the application of SP-36 together with soil conditioners can increase dry corn kernel yield and phosphorus fertilization efficiency, indicating that additional phosphorus can boost yields when it is indeed a limiting factor in the field.

Theoretically, this explanation is also supported by a publication from the Ministry of Agriculture stating that water-soluble phosphate fertilizers are easily absorbed by plant roots, while phosphorus plays a crucial role in root growth and the early stages of plant development; thus, the appropriate use of SP-36 can more rapidly boost productivity and farmers' income. Thus, your research findings reinforce the view that fertilizer subsidies are determined not only by the presence or absence of assistance but also by the appropriateness of the fertilizer type relative to nutrient needs in the field; in this context, SP-36 appears more effective because phosphorus can increase production, which in turn boosts farmers' income and is reflected in a rise in the NTP.

ZA Fertilizer Subsidy (X_5)

The significance test results show that the ZA fertilizer subsidy variable (X_5) has a *t-statistic* value of -1.773 with a probability value of 0.107, which is greater than the significance level. Thus, H_0 is accepted and H_1 is rejected, leading to the conclusion that the ZA fertilizer subsidy variable does not have a significant effect on the Farmers' Terms of Trade (NTP). The negative regression coefficient of -0.621 indicates that every increase in ZA fertilizer use tends to reduce the NTP by 0.621%, assuming all other variables remain constant. However, since this effect is not statistically significant, the relationship is not strong enough to explain changes in farmers' welfare within the model during the study period.

This finding is consistent with (Putri *et al.,* 2024), who found that ZA fertilizer does not have a significant effect on rice production; thus, fertilizer subsidies are not always a universal solution for improving farmers' welfare. Furthermore, according to a study by (Rizki *et al.,* 2024) on the effectiveness of fertilizer subsidy implementation in Karawang, the relationship between

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the effectiveness of fertilizer subsidy policy implementation and fertilizer usage rates was relatively weak; moreover, several indicators—such as the appropriateness of fertilizer type, price, quality, and distribution location—showed no correlation with farmers' fertilizer usage rates, indicating that the benefits of subsidies depend heavily on the accuracy of their implementation in the field. From an agronomic perspective, ZA fertilizer is not always the primary fertilizer for all crops; according to research on cayenne pepper, ZA fertilizer is particularly relevant due to its nitrogen and sulfur content—elements specifically required by certain crops like chili peppers—while sulfur is also reported to be highly needed in shallots.

Thus, in the context of Southeast Sulawesi Province—where leading crops are predominantly plantation crops such as cocoa, coconut, cashews, pepper, and coffee—the relatively limited and uneven use of ZA fertilizer is very likely to result in a less noticeable impact on the Net Farm Income (NTP). In other words, the results of this study confirm that the effectiveness of ZA fertilizer subsidies is largely determined by the suitability of the fertilizer type to crop nutrient needs, the commodity patterns cultivated by farmers, and the accuracy of subsidy implementation in the field. These findings are consistent with Putri *et al.* (2024), who stated that the effectiveness of fertilizer subsidies is highly dependent on the accuracy of use and implementation in the field.

People's Business Credit (X_6)

Regarding the credit subsidy policy—specifically the People's Business Credit (KUR)—it had no significant impact on the Farmers' Price Ratio (NTP) in Southeast Sulawesi Province during the study period. The significance test results indicate that the People's Business Credit (X_6) had a *t-statistic* of -2.080 with a probability value of 0.064, which is smaller than the 10% significance level (0.10); thus, the KUR variable has a significant effect on farmers' welfare, as proxied by the Farmers' Price Ratio (NTP), at a 90% confidence level. The regression coefficient of -0.029 indicates that every 1 billion increase in People's Business Credit (KUR) disbursement will reduce the farmers' NTP by 0.029%,

Based on available data, KUR disbursements have also increased, particularly over the last six years; however, this increase in KUR disbursements in the field has not automatically been accompanied by an improvement in farmers' welfare. This means that, while credit volumes have indeed increased in nominal terms, the economic benefits have not yet been fully realized in agricultural operations. The phenomenon observed in the field can be explained by the fact that an increase in KUR does not necessarily mean that all farmers actually have easy access to the credit or utilize it productively.

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In many cases, the increase in KUR disbursements primarily reflects a rise in the amount of funds distributed, but it does not guarantee that those funds are used specifically to boost agricultural production. Some farmers may use KUR for household needs, to pay off old debts, or for other business needs outside of agriculture, thereby weakening its impact on farm income. As a result, even though credit has increased, the NTP has not risen significantly. Another common issue is that access to KUR is uneven among farmers. Farmers who own larger plots of land, have more complete documentation, or have closer ties to lending institutions typically find it easier to obtain credit.

Conversely, smallholder farmers often face administrative hurdles, lack information, or are afraid to take on debt due to concerns about crop failure and an inability to make loan payments. As a result, the year-over-year increase in KUR loans has not necessarily been widely enjoyed by all farmers, so its impact on farmers' aggregate well-being is not very noticeable. A similar study was also conducted by Putra and Hidayat (2019), who found that farmers' limited financial literacy prevents program loans from being optimally utilized to increase farmers' income. Due to these limitations, research by Rahman (2020) also indicates that government program loans have not had a significant impact on the Farmers' Terms of Trade because administrative and procedural barriers still exist in the disbursement of loans.

Another study by Wahyuni *et al.* (2021) also states that program credit financing can have a negative impact on farmers' welfare if its distribution is not carried out selectively and in a targeted manner. Thus, the results of this study reinforce the findings of previous research indicating that Program Credit Subsidies have not been able to directly improve farmers' welfare in Southeast Sulawesi Province; therefore, other supporting policies are needed, such as business mentoring, improving financial literacy, and strengthening farmers' institutions.

CONCLUSION

This study shows that the Farmers' Terms of Trade (NTP) in Southeast Sulawesi Province during the 2009–2025 period experienced fluctuating dynamics, reflecting changes in farmers' welfare influenced by economic conditions, agricultural commodity prices, production costs, and government policies. The results of the regression analysis show that, taken together, fertilizer subsidies and People's Business Credit (KUR) subsidies have a significant effect on the NTP, with the model explaining 85.71% of the variation in the NTP. Partially, subsidies for UREA fertilizer, organic fertilizer, and KUR have a significant effect but tend to lower the NTP, while subsidies for SP-36 fertilizer have a positive effect on increasing the NTP. Meanwhile, subsidies for NPK and ZA fertilizers do not have a significant effect on the NTP. These findings indicate that the

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effectiveness of subsidy policies is highly determined by the appropriateness of the type, distribution, and utilization of subsidies by farmers.

The government needs to improve the effectiveness of fertilizer and KUR subsidy distribution through monitoring of distribution, adjusting subsidy types to commodity needs and land conditions, and providing guidance to farmers to ensure more productive use of these resources. On the other hand, farmers are expected to apply fertilizers in a balanced manner according to land needs and utilize business loans for productive activities. Future research is recommended to include additional variables, such as commodity prices, production costs, inflation, and climatic factors, as well as to use a broader data scope or analytical methods to obtain a more comprehensive picture of the factors influencing the Farmers' Terms of Trade.

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