

# Supply Response Analysis of Garlic in West Nusa Tenggara Province

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**Abstract:** This study aims to analyze the factors influencing the supply of garlic and to examine the production response of garlic to output prices, alternative crop prices, input prices, and technical (non-economic) variables in West Nusa Tenggara Province. The research method used is a descriptive method with a quantitative approach. The sample was determined using all monthly data from the 2018–2023 period, consisting of 504 samples for the first objective and 336 samples for the second. The type of data used is secondary data in the form of a time series from 2018 to 2023. The data collection technique used in this study is documentation. The data were analyzed using the Cobb-Douglas function, econometric models, statistical criteria tests, and econometric criteria tests. The results show that the significant factors affecting the supply of garlic are the area of garlic cultivation and garlic productivity. Furthermore, variables that have a significant positive effect on current garlic production include the previous month's garlic production and the previous month's shallot price.

**Keywords:** Garlic. Supply Response. Production. Cobb-Douglas Function.

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## I. INTRODUCTION

Garlic (*Allium sativum* L.) is one of the essential commodities used as a basic cooking ingredient and contributes to human health maintenance [1]. Due to its widespread use in traditional medicine, garlic has become a staple necessity for society [2]. Indonesia is one of the garlic-producing countries and achieved self-sufficiency in the 1990s before the large-scale liberalization of the agricultural sector in 1998, which led to a continuous decline in national garlic production until today.

Domestic garlic production, which stands at around 20,000 tons or approximately 4% of national demand, is insufficient to meet Indonesia's needs. Since 2015, the Ministry of Agriculture, through the state budget (APBN) program, has encouraged farmers to plant garlic and has attempted to reduce imports by issuing the Horticultural Product Import Recommendation (RIPH) under Ministerial Regulation No. 38/2017, later revised as Regulation No. 24/2018 [3].

West Nusa Tenggara Province has contributed to restoring garlic self-sufficiency, ranking second nationally in 2023 with a garlic production volume of 7,057 tons. The main garlic production centers in the province are East Lombok Regency and Bima Regency. However, garlic production in West Nusa Tenggara tends to decline and cannot meet the increasing consumption needs of the community. On December 29, 2023, the National Food Agency, through the Directorate of Distribution and Food Reserves, monitored the government-held (CPP) and commercial stocks managed by BULOG, which amounted to only 11.36 tons far below the national monthly requirement of 55,043 tons. To address this shortage, the government has again issued import quotas for garlic [4].

Indonesia's garlic imports remain relatively high and fluctuating. The rising volume of garlic imports has caused domestic garlic production to lose competitiveness, as imported garlic is cheaper than domestic garlic. This price disparity reduces demand for local garlic and influences farmers' decisions on whether to continue garlic farming. Farmers' decisions to cultivate garlic can be assessed through their production response behavior.

Based on the above background, this research is conducted under the title "Supply Response Analysis of Garlic in West Nusa Tenggara Province." The objectives of this study are to analyze the factors influencing garlic supply and to examine the production response of garlic to output prices, alternative crop prices, input prices, and technical (non-economic) variables in West Nusa Tenggara Province.

## II. RESEARCH METHODS

The method used in this research is a descriptive method with a quantitative approach. The sample was determined by collecting all monthly data from the period 2018–2023 related to the supply response of garlic in West Nusa Tenggara Province. For the first objective, a total of 504 samples were obtained. For the second objective, which includes lagged variables in the analysis, the number of observations is reduced by one per year, resulting in a total of 336 samples. The type of data used in this study is secondary data in the form of a time series from 2018 to 2023. The data collection technique used is documentation.

The data analysis methods used in this study are as follows:

### 1. Cobb-Douglas Function Analysis

The Cobb-Douglas function is an equation involving two or more variables, consisting of a dependent variable and independent variables whose relationships are explained using regression analysis [5].

$$Y = aX_1^{b_1}X_2^{b_2}X_3^{b_3}X_4^{b_4}X_5^{b_5}X_6^{b_6}$$

This equation is then transformed into a logarithmic form as follows:

$$\log Y = \log a + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + b_5 \log X_5 + b_6 \log X_6$$

Where:

$\alpha$  = Constant

$b_i$  = Regression coefficient of the i-th independent variable

Y = Garlic supply (tons/month)

$X_1$  = Garlic cultivation area (ha/month)

$X_2$  = Garlic productivity (tons/ha)

$X_3$  = Garlic price (Rp/kg)

$X_4$  = Shallot price (Rp/kg)

$X_5$  = SP-36 fertilizer price (Rp/kg)

$X_6$  = Rainfall (mm/month)

### 2. Econometric Model

The following equation is used in the model analysis:

Garlic Production Response Model (PRBP)

$$PRBP = bPRBP_{t-1}^{b_1}HRBP_{t-1}^{b_2}HRBM_{t-1}^{b_3}HRPS_{t-1}^{b_4}CH_t^{b_5}e^b$$

This is then transformed into the natural logarithmic form:

$$\log PRBP = \log b_0 + b_1 \log PRBP_{t-1} + b_2 \log HRBP_{t-1} + b_3 \log HRBM_{t-1} + b_4 \log HRPS_{t-1} + b_5 \log CH_t + e_b$$

Where:

PRBP = Current month's garlic production (tons/month)

$PRBP_{t-1}$  = Previous month's garlic production (tons/month)

$HRBP_{t-1}$  = Previous month's garlic price (Rp/kg)

$HRBM_{t-1}$  = Previous month's shallot price (Rp/kg)

$HRPS_{t-1}$  = Previous month's SP-36 fertilizer price (Rp/kg)

$CH_t$  = Current month's rainfall (mm/month)

$b_0$  = Regression equation constant

$b_1 - b_5$  = Estimated parameters

$t-1$  = Previous month

log = Natural logarithm

$e$  = Error term

### 3. Statistical Criteria Tests

#### a. Coefficient of Determination ( $R^2$ )

R-square ( $R^2$ ) is used to determine how well the regression line represents the observed data.

#### b. Simultaneous Test (F-Test)

The F-test aims to determine whether all independent variables together significantly affect the dependent variable [6]. The regression coefficients are tested simultaneously using ANOVA to assess their joint significance [7].

Hypotheses:

- 1)  $H_0$ : Probability  $> \alpha = 5\%$ , meaning that all independent variables in the model jointly have no significant effect on the dependent variable.
- 2)  $H_a$ : Probability  $< \alpha = 5\%$ , meaning that all independent variables in the model jointly have a significant effect on the dependent variable.

#### c. Partial Test (T-Test)

The t-test aims to determine the partial significance of each independent variable on the dependent variable [6].

The hypotheses used in this test are as follows:

- 1)  $H_0$ : Probability  $> \alpha = 5\%$ , meaning the regression coefficient of the independent variable is not significant or has no effect on the dependent variable.
- 2)  $H_a$ : Probability  $< \alpha = 5\%$ , meaning the regression coefficient of the independent variable is significant or has a significant effect on the dependent variable.

### 4. Econometric Criteria Tests

#### a. Multicollinearity Test

The multicollinearity test aims to determine whether there is a perfect or exact linear relationship among some or all of the independent variables in a regression model [8].

Hypotheses:

- 1)  $H_0$ :  $VIF > 10$ , indicating the presence of multicollinearity among independent variables.
- 2)  $H_a$ :  $VIF < 10$ , indicating no multicollinearity among independent variables.

#### b. Heteroskedasticity Test

This test aims to determine whether there is a variance inequality of the residuals across all observations in the regression model [9].

Hypotheses:

- 1)  $H_0$ :  $P > \alpha = 5\%$ , indicating no heteroskedasticity problem.
- 2)  $H_a$ :  $P < \alpha = 5\%$ , indicating a heteroskedasticity problem.

#### c. Autocorrelation Test

The autocorrelation test aims to detect the relationship between one variable and another over time [10].

Hypotheses:

- 1)  $H_0$ :  $P > \alpha = 5\%$ , indicating no autocorrelation between variables.
- 2)  $H_a$ :  $P < \alpha = 5\%$ , indicating autocorrelation between variables.

### III. RESULTS AND DISCUSSION

#### Analysis of Factors Affecting Garlic Supply in West Nusa Tenggara Province

##### 1. Parameter Estimation of the Model for Factors Affecting Garlic Supply

**Table 1. Estimated Parameters of Factors Affecting Garlic Supply**

Variable	Coefficient	Std. Error	T-statistic	Prob.
C	0.1977	0.2207	0.8959	0.3750
Log X1 (garlic cultivation area)	1.0009	0.0013	743.3916	0.0000
Log X2 (garlic productivity)	1.0001	0.0009	1114.0330	0.0000
Log X3 (garlic price)	0.0039	0.0065	0.6025	0.5498
Log X4 (shallot price)	-0.2381	0.3788	-0.6286	0.5327
Log X5 (SP-36 fertilizer price)	-0.0311	0.0357	-0.8731	0.3871
Log X6 (rainfall)	0.2530	0.4096	0.6177	0.5398
F-statistic	= 284795.1000			
Prob (F-statistic)	= 0.0000			
R <sup>2</sup>	= 0.9999			

Source: Processed EViews 12 Data (2025)

Based on Table 1 above, the following equation is obtained:

$$\text{Log Y} = 0.1977 + 1.0009 \text{ Log X1} + 1.0001 \text{ Log X2} + 0.0039 \text{ Log X3} - 0.2381 \text{ Log X4} - 0.0311 \text{ Log X5} + 0.2530 \text{ Log X6}$$

The equation can be interpreted as follows:

- 1) If all independent variables (garlic cultivation area, garlic productivity, garlic price, shallot price, SP-36 fertilizer price, and rainfall) remain constant, the quantity of garlic supply will increase by 0.1977 units.
- 2) If the garlic cultivation area increases by one unit while other variables remain constant, the quantity of garlic supply will increase by 1.0009 units.
- 3) If garlic productivity increases by one unit while other variables remain constant, the quantity of garlic supply will increase by 1.0001 units.
- 4) If the garlic price increases by one unit while other variables remain constant, the quantity of garlic supply will increase by 0.0039 units.
- 5) If the shallot price increases by one unit while other variables remain constant, the quantity of garlic supply will decrease by 0.2381 units.
- 6) If the price of SP-36 fertilizer increases by one unit while other variables remain constant, the quantity of garlic supply will decrease by 0.0311 units.
- 7) If rainfall increases by one unit while other variables remain constant, the quantity of garlic supply will increase by 0.2530 units.

##### 2. Results of Classical Assumption Tests for the Model of Factors Affecting Garlic Supply

###### a. Multicollinearity Test

**Table 2. Results of Multicollinearity Test for Factors Affecting Garlic Supply**

Independent Variable	VIF Value
Log X1 (garlic cultivation area)	2.580708
Log X2 (garlic productivity)	2.463640
Log X3 (garlic price)	1.061296
Log X4 (shallot price)	6621.558
Log X5 (SP-36 fertilizer price)	5.447995
Log X6 (rainfall)	6642.106

Source: Processed EViews 12 Data (2025)

Based on Table 2, it can be seen that the independent variables (X1, X2, X3, and X5) show that  $H_0$  is rejected  $H_a$  is accepted, meaning that these four independent variables passed the multicollinearity test. Meanwhile, the independent variables X4 and X6 are indicated to have symptoms of multicollinearity.

b. Heteroskedasticity Test

**Table 3. Results of Heteroskedasticity Test for Factors Affecting Garlic Supply**

<i>White Heteroskedasticity Test:</i>			
F-statistic	11.81849	Probability	0.0000
Obs*R-squared	47.51737	Probability	0.0013
Scaled explained SS	222.7352	Probability	0.0000

Source: Processed EViews 12 Data (2025)

Based on Table 3, it can be seen that the probability value of Obs\*R-squared is 0.0013, so  $H_0$  is rejected and  $H_a$  is accepted, meaning that the model shows symptoms of heteroskedasticity.

c. Autocorrelation Test

**Table 4. Results of Autocorrelation Test for Factors Affecting Garlic Supply**

<i>Breusch–Godfrey Serial Correlation LM Test</i>			
F-statistic	0.084738	Probability	0.9189
Obs*R-squared	0.203358	Probability	0.9033

Source: Processed EViews 12 Data (2025)

Based on Table 4, the probability value of Obs\*R-squared is 0.9033, so  $H_0$  is accepted and  $H_a$  is rejected, indicating that there is no autocorrelation problem in the model.

**3. Hypothesis Testing**

1) T-Test Results (Partial Significance Test)

The t-test results for this study can be seen in Table 1 above, and the conclusions are as follows:

- a. The coefficient of variable X1 (garlic cultivation area) is 743.3916 with a probability value of 0.0000, thus  $H_0$  is rejected and  $H_a$  is accepted. This means that the garlic cultivation area has a significant effect on garlic supply.
- b. The coefficient of variable X2 (garlic productivity) is 1114.0330 with a probability value of 0.0000, thus  $H_0$  is rejected and  $H_a$  is accepted. This means that garlic productivity has a significant effect on garlic supply.
- c. The coefficient of variable X3 (garlic price) is 0.6025 with a probability value of 0.5498, thus  $H_0$  is accepted and  $H_a$  is rejected. This indicates that garlic price has no significant effect on garlic supply.
- d. The coefficient of variable X4 (shallot price) is -0.6286 with a probability value of 0.5327, thus  $H_0$  is accepted and  $H_a$  is rejected. This means that shallot price has no significant effect on garlic supply.
- e. The coefficient of variable X5 (SP-36 fertilizer price) is -0.8731 with a probability value of 0.3871, thus  $H_0$  is accepted and  $H_a$  is rejected. This implies that SP-36 fertilizer price has no significant effect on garlic supply.
- f. The coefficient of variable X6 (rainfall) is 0.6177 with a probability value of 0.5398, thus  $H_0$  is accepted and  $H_a$  is rejected. This shows that rainfall has no significant effect on garlic supply.

2) F-Test Results (Simultaneous Significance Test)

Based on Table 1, the F-statistic value is 284,795.1000 with a probability value of 0.0000, thus  $H_0$  is rejected and  $H_a$  is accepted. This indicates that all independent variables included in the model jointly have a significant effect on the dependent variable Y (garlic supply).

**4. R<sup>2</sup> Test Results (Coefficient of Determination)**

From Table 1, the Adjusted R-Square value is 0.9999. This means that 99.99% of the changes or variation in the dependent variable (garlic supply) can be explained by the variation in the independent variables, while the remaining 0.01% is explained by other variables outside the model.

5. Economic Interpretation of Factors Affecting Garlic Supply

The estimated model is:

$$Y = e^{0.1977} \cdot X1^{1.0009} \cdot X2^{1.0001} \cdot X3^{0.0039} \cdot X4^{-0.2381} \cdot X5^{-0.0311} \cdot X6^{0.2530}$$

1) Effect of Garlic Cultivation Area on Garlic Supply

The cultivation area has a significant positive effect on garlic supply, with a regression coefficient of 1.0009. In other words, if the cultivation area increases by one unit, garlic supply will increase by 1.0009 units. [11] stated that cultivation area has a significantly positive impact on garlic supply. Expanding planted areas, combined with efficient farming techniques and input use, can increase garlic production.

2) Effect of Garlic Productivity on Garlic Supply

Garlic productivity has a significant positive effect on garlic supply, with a regression coefficient of 1.0001. This means that a one-unit increase in productivity will increase garlic supply by 1.0001 units. [12] noted that higher productivity results in higher output, leading to greater income for farmers, which influences their decision to continue farming.

3) Effect of Garlic Price on Garlic Supply

Garlic price has a positive but insignificant effect on garlic supply, with a regression coefficient of 0.0039. This implies that a one-unit increase in garlic price will only increase supply by 0.0039 units. [11] explained that garlic price does not significantly affect garlic production due to the weak response of farmers to price changes, as they assume prices will stabilize by the next harvest season.

4) Effect of Shallot Price on Garlic Supply

Shallot price has a negative and insignificant effect on garlic supply, with a regression coefficient of -0.2381. In other words, a one-unit increase in shallot price will reduce garlic supply by 0.2381 units. [11] also indicated a negative relationship, though this study finds shallots and garlic may act as complementary goods whose price shifts could indirectly affect supply.

5) Effect of SP-36 Fertilizer Price on Garlic Supply

SP-36 fertilizer price has a negative and insignificant effect on garlic supply, with a regression coefficient of -0.0311. This suggests that a one-unit increase in fertilizer price will reduce garlic supply by 0.0311 units. [11] noted that higher fertilizer prices could influence supply, although the effect may vary depending on planting seasons and input substitution.

6) Effect of Rainfall on Garlic Supply

Rainfall has a positive but insignificant effect on garlic supply, with a regression coefficient of 0.2530. This means that a one-unit increase in rainfall will increase garlic supply by 0.2530 units. [11] stated that farmers typically plan planting and harvesting times carefully to avoid crop damage from pests and diseases that spread more rapidly in the rainy season.

Analysis of Garlic Production Response in West Nusa Tenggara Province

1. Parameter Estimation of the Garlic Production Response Model

Table 5. Estimated Parameters of Factors Affecting Garlic Production Response

Variable	Coefficient	Std. Error	T-statistic	Prob.
C	44.4673	20.9976	2.1177	0.0396
Log $PRBP_{t-1}$ (previous month's garlic production)	0.3768	0.1492	2.5254	0.0151
Log $HRBP_{t-1}$ (previous month's garlic price)	0.8793	0.8926	0.9851	0.3297
Log $HRBM_{t-1}$ (previous month's shallot price)	2.2538	0.9261	2.4338	0.0189
Log $HRPS_{t-1}$ (previous month's SP-36 fertilizer price)	-5.8546	2.3287	-2.5142	0.0155
Log $CH_t$ (current month's rainfall)	-2.8555	1.0745	-2.6575	0.0108
F-statistic	= 6.4911			
Prob (F-statistic)	= 0.0001			
R <sup>2</sup>	= 0.3499			

Source: Processed EViews 12 Data (2025)

Based on Table 5 above, the following equation is obtained:

$$\text{Log PRBP} = 44.4673 + 0.3768 \text{ Log PRBP}_{t-1} + 0.8793 \text{ Log HRBP}_{t-1} + 2.2538 \text{ Log HRBM}_{t-1} - 5.8546 \text{ Log HRPS}_{t-1} - 2.8555 \text{ Log CH}_t$$

This equation can be interpreted as follows:

- 1) If all independent variables (previous month's garlic production, previous month's garlic price, previous month's shallot price, previous month's SP-36 fertilizer price, and current month's rainfall) remain constant, then the current month's garlic production will increase by 44.4673 units.
- 2) If the variable previous month's garlic production increases by one unit, while other variables remain constant, the current month's garlic production will increase by 0.3768 units.
- 3) If the variable previous month's garlic price increases by one unit, while other variables remain constant, the current month's garlic production will increase by 0.8793 units.
- 4) If the variable previous month's shallot price increases by one unit, while other variables remain constant, the current month's garlic production will increase by 2.2538 units.
- 5) If the variable previous month's SP-36 fertilizer price increases by one unit, while other variables remain constant, the current month's garlic production will decrease by 5.8546 units.
- 6) If the variable current month's rainfall increases by one unit, while other variables remain constant, the current month's garlic production will decrease by 2.8555 units.

## 2. Results of Classical Assumption Tests for the Garlic Production Response Model

### a. Multicollinearity Test

**Table 6. Multicollinearity Test Results of the Garlic Production Response Model**

Independent Variable	VIF Value
Log $PRBP_{t-1}$ (previous month's garlic production)	1.2509
Log $HRBP_{t-1}$ (previous month's garlic price)	1.0134
Log $HRBM_{t-1}$ (previous month's shallot price)	2.0271
Log $HRPS_{t-1}$ (previous month's SP-36 fertilizer price)	1.1940
Log $CH_t$ (current month's rainfall)	2.0883

Source: Processed EViews 12 Data (2025)

Based on Table 6, the VIF values for all independent variables are less than 10. Therefore,  $H_0$  is rejected and  $H_a$  is accepted, meaning that all independent variables passed the multicollinearity test.

### b. Heteroskedasticity Test

**Table 7. Heteroskedasticity Test Results of the Garlic Production Response Model**

White Heteroskedasticity Test:			
F-statistic	0.5076	Probability	0.9389
Obs*R-squared	12.0426	Probability	0.8838
Scaled explained SS	20.5996	Probability	0.3593

Source: Processed EViews 12 Data (2025)

Based on Table 7, the probability value of Obs\*R-squared is 0.8838, thus  $H_0$  is accepted and  $H_a$  is rejected, indicating that there is no heteroskedasticity problem in the model.

### c. Autocorrelation Test

**Table 8. Autocorrelation Test Results of the Garlic Production Response Model**

Breusch–Godfrey Serial Correlation LM Test			
F-statistic	0.5547	Probability	0.5782
Obs*R-squared	1.2789	Probability	0.5276

Source: Processed EViews 12 Data (2025)

Based on Table 8, the probability value of Obs\*R-squared is 0.5276, so  $H_0$  is accepted and  $H_a$  is rejected, indicating that there is no autocorrelation problem in the model.

### 3. Hypothesis Testing

#### 1) T-Test Results (Partial Significance Test)

The T-test results for this study can be seen in Table 5, and the conclusions are as follows:

- a. The coefficient of the variable  $PRBP_{t-1}$  (Garlic Production in the Previous Month) is 2.5254 with a probability value of 0.0151, so  $H_0$  is rejected and  $H_a$  is accepted, meaning that garlic production in the previous month has a significant effect on current garlic production.
- b. The coefficient of the variable  $HRBP_{t-1}$  (Garlic Price in the Previous Month) is 0.9851 with a probability value of 0.3297, so  $H_0$  is accepted and  $H_a$  is rejected, meaning that garlic price in the previous month does not have a significant effect on current garlic production.
- c. The coefficient of the variable  $HRBM_{t-1}$  (Shallot Price in the Previous Month) is 2.4338 with a probability value of 0.0189, so  $H_0$  is rejected and  $H_a$  is accepted, meaning that shallot price in the previous month has a significant effect on current garlic production.
- d. The coefficient of the variable  $HRPS_{t-1}$  (SP-36 Fertilizer Price in the Previous Month) has a t-statistic of -2.5142 with a probability value of 0.0155, so  $H_0$  is rejected and  $H_a$  is accepted, meaning that SP-36 fertilizer price in the previous month has a significant effect on current garlic production.
- e. The coefficient of the variable  $CH_t$  (Current Rainfall) is -2.6575 with a probability value of 0.0108, so  $H_0$  is rejected and  $H_a$  is accepted, meaning that current rainfall has a significant effect on current garlic production.

#### 2) F-Test Results

Based on Table 13, the F-statistic is 6.4911 with a probability value of 0.0001, so  $H_0$  is rejected and  $H_a$  is accepted. This indicates that all independent variables together have a significant effect on current garlic production.

### 4. $R^2$ (Coefficient of Determination)

Based on Table 13, the Adjusted R-Square value is 0.3499. This means that 34.99% of the variation in the dependent variable (current month's garlic production) can be explained by the variation in all independent variables included in the model, while the remaining 65.01% is explained by other variables outside the model.

### 5. Economic Interpretation of the Garlic Production Response

$$PRBP = b^{44.4673} \cdot PRBP_{t-1}^{0.3768} \cdot HRBP_{t-1}^{0.8793} \cdot HRBM_{t-1}^{2.2538} \cdot HRPS_{t-1}^{-5.8546} \cdot CH_t^{-2.8555}$$

#### 1) Previous Month's Garlic Production ( $PRBP_{t-1}$ )

The previous month's garlic production has a significant positive effect on the current month's garlic production, with a regression coefficient value of 0.3768. In other words, if previous month's garlic production increases by one unit, the current month's garlic production will increase by 0.3768 units. This indicates that garlic production in West Nusa Tenggara Province is sustainable, which may be due to farmers' hereditary habits in cultivating garlic. [13] states that farmers' choice of a commodity is based on habits and experiences, as well as conformity with customary traditions that have been practiced for generations.

#### 2) Previous Month's Garlic Price ( $HRBP_{t-1}$ )

The previous month's garlic price has a positive but not significant effect on current garlic production. Farmers' limited access to market price information is a constraint. [14] mentioned that long marketing chains reduce the benefits farmers receive from high retail prices, as most of the profits are taken by middlemen. Thus, even if market prices increase, farmers may still sell at low prices.

#### 3) Previous Month's Shallot Price ( $HRBM_{t-1}$ )

The previous month's shallot price has a significantly positive effect on current garlic production, with a coefficient of 2.2538. In other words, a one-unit increase in shallot price results in a 2.2538 unit increase in garlic production. [15] suggested that shallot and garlic prices are interlinked, as the two can be substitutes in certain uses, though not entirely.

4) Previous Month's SP-36 Fertilizer Price ( $HRPS_{t-1}$ )

The price of SP-36 fertilizer in the previous month has a significantly negative effect on garlic production, with a regression coefficient of -5.8546. In other words, a one-unit increase in fertilizer price will reduce garlic production by 5.8546 units. [14] explained that rising input costs, even when commodity prices are high, can discourage production.

5) Current Rainfall ( $CH_t$ )

Current rainfall has a significantly negative effect on garlic production, with a coefficient of -2.8555. In other words, a one-unit increase in rainfall decreases garlic production by 2.8555 units. [11] explained that excessive rainfall can cause garlic bulbs to rot, due to overly wet soil conditions.

#### IV. CONCLUSION AND RECOMMENDATIONS

##### Conclusion

Based on the results of the analysis and discussion, the following conclusions can be drawn:

1. The factors that significantly influence the supply of garlic in West Nusa Tenggara Province are the area of garlic cultivation ( $X_1$ ) with a probability of 0.0000 and garlic productivity ( $X_2$ ) with a probability of 0.0000. Meanwhile, the factors that have an insignificant effect are the price of garlic ( $X_3$ ) with a probability of 0.5498, shallot price ( $X_4$ ) with a probability of 0.5327, SP-36 fertilizer price ( $X_5$ ) with a probability of 0.3871, and rainfall ( $X_6$ ) with a probability of 0.5398.
2. The variables that have a significantly positive effect on current month's garlic production (PRBP) are the previous month's garlic production ( $PRBP_{t-1}$ ) with a probability of 0.0151, and the previous month's shallot price ( $HRBM_{t-1}$ ) with a probability of 0.0189. Meanwhile, variables that have a significant negative effect on current garlic production are the previous month's SP-36 fertilizer price ( $HRPS_{t-1}$ ) with a probability of 0.0155, and the current month's rainfall ( $CH_t$ ) with a probability of 0.0108. The variable that has an insignificant effect on current garlic production is the previous month's garlic price ( $HRBP_{t-1}$ ) with a probability of 0.3297.

##### Recommendations

Based on the research findings, the following recommendations are suggested:

1. Efforts to increase the supply of garlic should primarily focus on increasing garlic production. The government can organize activities such as agricultural extension programs, facilitate agricultural technology, and ensure the availability of production inputs to support garlic production improvements.
2. Farmers, especially those in garlic-producing centers such as West Nusa Tenggara Province, are encouraged to increase their garlic production. This can be a viable alternative to boost overall garlic output by optimizing the available local resources.

#### REFERENCES

- [1] S. R. Lestari, Monograf Bawang Putih Tunggal: Khasiat dan Manfaatnya. Malang: Universitas Negeri Malang, 2021. [Online]. Available: [https://fmipa.um.ac.id/wp-content/uploads/2021/10/Bawang-Putih-Tunggal\\_hasiat-dan-manfaatnyaMonograf\\_Sri-R\\_OK.pdf](https://fmipa.um.ac.id/wp-content/uploads/2021/10/Bawang-Putih-Tunggal_hasiat-dan-manfaatnyaMonograf_Sri-R_OK.pdf)
- [2] O. Obel, E. Resigia, and J. Jamsari, "Uji Daya Adaptasi Beberapa Varietas Bawang Putih (*Allium sativum* L.) DI Kabupaten Pesisir Selatan," J. Agroekoteknologi, vol. 12, no. 2, pp. 152–164, 2020, doi: DOI: <http://dx.doi.org/10.33512/jur.agroekotetek.v12i2.11494>.
- [3] Kementerian Pertanian, "Evaluasi kebijakan Wajib Tanam Lima Persen Bagi Importir Bawang Putih," Bogor, 2018. [Online]. Available: <https://psekp.setjen.pertanian.go.id/web/wp-content/uploads/2022/12/2018-ANJAK-BSY.pdf>
- [4] Badan Pangan Nasional, Rencana Aksi Deputi Bidang Ketersediaan dan Stabilisasi Pangan Tahun 2024. Jakarta: Badan Pangan Nasional, 2024. [Online]. Available: [https://badanpangan.go.id/storage/app/media/2024/RENCANA\\_AKSI\\_2024/Renaksi\\_Deputi\\_I\\_Bidang\\_Ketersediaan\\_dan\\_Stabilisasi\\_Pangan\\_2024.pdf](https://badanpangan.go.id/storage/app/media/2024/RENCANA_AKSI_2024/Renaksi_Deputi_I_Bidang_Ketersediaan_dan_Stabilisasi_Pangan_2024.pdf)
- [5] H. Abubakar, N. Whatoni, and Asnah, Ekonomi Produksi Teori Dan Aplikasi Fungsi Produksi Cobb-Douglas Dalam Bidang Pertanian. Tangerang Selatan: Gaung Persada, 2021. [Online]. Available: [http://eprints.unram.ac.id/42603/1/Abubakar\\_Buku\\_EKONOMI\\_PRODUKSI\\_Teori\\_dan\\_Aplikasi\\_Produksi\\_Cobb-Douglas\\_Dalam\\_Bidang\\_Pertanian.pdf](http://eprints.unram.ac.id/42603/1/Abubakar_Buku_EKONOMI_PRODUKSI_Teori_dan_Aplikasi_Produksi_Cobb-Douglas_Dalam_Bidang_Pertanian.pdf)

- [6] S. H. Sahir, *Metodologi Penelitian*. Jogjakarta: PENERBIT KBM INDONESIA, 2021.
- [7] R. Mubarak, *Pengantar Ekonometrika*. Bangkes: Duta Media Publishing, 2021.
- [8] M. I. Mutmainah, *Analisis Data Kuantitatif (Uji Instrumen, Uji Asumsi Klasik, Uji Korelasi dan Regresi Linier Berganda)*. Klaten: Lakeisha, 2019.
- [9] A. Zahriyah, Suprianik, A. Parmono, and Mustofa, *Ekonometrika*. Jawa Timur: Mandala Press, 2021.
- [10] C. S. Bintoro, "Analisis Faktor-Faktor Yang Mempengaruhi Investasi Asing Langsung Di Indonesia," *J. Econ.*, vol. 1, no. 3, pp. 547–562, 2022, doi: 10.55681/economina.v1i3.131.
- [11] B. M. Lingga, S. Marwanti, and R. U. Fajarningsih, "Faktor-faktor yang Memengaruhi Penawaran Bawang Putih (*Allium sativum L.*) di Kabupaten Karanganyar," *Agrista*, vol. 9, no. 3, pp. 10–22, 2021, [Online]. Available: <https://jurnal.uns.ac.id/agrista/article/view/56543>
- [12] D. Ardian and Marliati, "Faktor yang Berpengaruh Terhadap Keputusan Petani Adopsi Provinsi Riau," *Din. Pertan.*, vol. 40, no. 1, pp. 93–106, 2024, doi: [https://doi.org/10.25299/dp.2024.vol40\(1\).18873](https://doi.org/10.25299/dp.2024.vol40(1).18873).
- [13] Zahara et al., "Keputusan Adopsi Inovasi Teknologi Berbasis Kearifan Lokal Pada Budidaya Kopi Di Lampung," vol. 14, no. 2, pp. 5–8, 2024.
- [14] F. W. Nugroho, M. F. Handrian, M. Khaikal, and A. Malik, "Pengaruh harga terhadap jumlah penawaran produk pertanian di indonesia," vol. 2, pp. 59–67, 2025.
- [15] W. M. Siagian, G. V. Pardosi, W. A. Manalu, R. A. Saptati, and A. B. Santoso, "Hubungan Harga Komoditas Hortikultura Antar Pasar di Provinsi Sumatera Utara, Indonesia," *Agro Bali Agric. J.*, vol. 6, no. 3, pp. 670–680, 2023, doi: 10.37637/ab.v6i3.1358.