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DETERMINANTS OF PEANUT FARM PRODUCTION IN SONE VILLAGE, CENTRAL INSANA DISTRICT, NORTH CENTRAL TIMOR REGENCY

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Abstract. Peanut farming plays an important role in supporting rural livelihoods in Sone Village, North Central Timor Regency; however, its production remains unstable. This study aims to analyze the factors affecting peanut production and estimate the output elasticity of each production factor. The research was conducted from September to October 2024 using a survey method involving 40 farmers selected through simple random sampling. Data were analyzed using a Cobb-Douglas production function in a log-linear regression model. The results show that land area, seeds, pesticides, labor, education, farming experience, and capital simultaneously have a significant effect on production. Partially, land area and farming experience have significant positive effects on peanut production. Labor has a positive effect, while seed use has a negative effect, both statistically significant at the 10% level. Pesticides, education, and capital do not have statistically significant effects. The coefficient of determination indicates that 50.8% of production variation is explained by the model. Peanut farming is economically feasible, generating an average net income of IDR 3,750,185 per season with an R/C ratio of 4.52, indicating that peanut cultivation remains profitable under existing production conditions. These findings imply that improving land management, strengthening farmers' production experience, and enhancing the quality and efficiency of seed and labor utilization are more important than simply increasing input use to improve peanut production.

Keywords: cobb-douglas; farming experience; land area; output elasticity; peanut production

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INTRODUCTION

Peanut (*Arachis hypogaea* L.) is a strategic commodity for smallholder farmers in Eastern Indonesia, serving dual functions as a source of household protein and cash income. As a leguminous crop, peanut enhances soil fertility through biological nitrogen fixation while generating raw material for domestic food processing industries (Fonisasi and Hutapea, 2019). Despite its economic importance, national peanut production in Indonesia has followed a concerning downward trajectory, declining from 418,414 tons in 2020 to 379,928 tons in 2022, with productivity fluctuating sharply between 1,696 and 2,952 kg/ha (Ministry of Agriculture, 2023). This instability signals systemic inefficiencies in factor utilization at the farm level.

East Nusa Tenggara Province represents a key production hub where agriculture employs the majority of the rural workforce. Provincial peanut output reached 12,476 tons in 2021 but fell to 11,304 tons in 2022, reflecting climate vulnerability and input market imperfections (Badan Pusat Statistik Nusa Tenggara Timur, 2024). Within the province, North Central Timor Regency contributes significantly, with production rising from 1,396 tons (2019) to 2,016 tons (2022); however, productivity remains stagnant at approximately 1,000 kg/ha, far below the national average (Badan Pusat Statistik Kabupaten Timor Tengah Utara, 2021). These figures suggest that output growth has been driven primarily by area expansion rather than intensification, raising questions about the efficiency of the allocation of production factors.

Sone Village exemplifies the biophysical and socio-economic constraints facing smallholder peanut farmers. Situated on hilly terrain with slopes of 15–40%, the village relies on rain-fed agriculture with limited mechanization. Local production data indicate extreme volatility, with output fluctuating from 4.5 tons in 2019 to merely 0.66 tons in 2021, before recovering to 12 tons in 2022, while productivity declined from 900 to 200 kg/ha over the same period, based on field data collected in Sone Village through farmer interviews and local agricultural records. Such variability indicates that production outcomes depend not merely on input quantities but on the optimal combination of physical inputs and managerial capacity under marginal agro-ecological conditions.

Previous empirical studies have identified inconsistent determinants of peanut production across Eastern Indonesia and other regions of Indonesia. (Fonisasi and Hutapea, 2019) found that land area, seeds, and labor significantly affected output in Fafinesu Village, whereas Tamar and Wadu (2023) confirmed only land area and seeds as significant in Hambapraing Village, with pesticides and labor found to be irrelevant. Parikaes et al. (2021) also reported significant effects for land and seeds in Kupang, while human capital variables such as education and experience remained non-significant.

Similar variations are observed in other regions. In Amuntai Tengah, land area, seeds, and fertilizer significantly influenced production, while pesticides and labor were not significant (Maulidya et al., 2025). In Dopang Village, production was simultaneously influenced by multiple inputs, but only land area and KCl fertilizer were significant individually (Denpasar and Mataram, 2024). In Lindo Village, land area and seed quantity had a significant positive effect, whereas labor, pesticides, and farming experience did not (Risma et al., 2024). In Lampung Tengah, land area, seeds, urea fertilizer, and labor were identified as significant determinants (Sinabariba et al., 2014), while in Sambung Makmur all inputs were significant. However, pesticides and hired labor showed negative elasticities due to excessive use (Ikhsan, 2012). Recent studies in East Nusa Tenggara further highlight that low agricultural productivity is often associated with inefficiencies in input allocation rather than limited access to inputs. Farmers tend to overuse certain inputs, such as fertilizers, while underutilizing others, such as quality seeds, resulting in suboptimal production performance (Fitriani et al., 2026). This evidence strengthens the argument that the variability of production determinants is closely linked to differences in input management behavior at the farm level.

From a theoretical perspective, agricultural production is commonly modeled using the Cobb-Douglas function, which decomposes output into the elasticities of land, labor, capital, and management inputs (Gujarati, 2004). In smallholder systems, however, factor markets are often imperfect, leading to allocative inefficiencies where increased input expenditure fails to translate into proportional output gains (Sukartawi, 2003). In Sone Village specifically, farmers predominantly use local seeds preserved from previous harvests, apply pesticides based on financial availability rather than integrated pest management calendars, and allocate capital toward durable equipment that may be underutilized on small plots. These behavioral patterns create a research gap: existing literature has not simultaneously examined the output elasticities of physical inputs and socio-economic characteristics within a steep-sloped, rain-fed smallholder context characterized by evident input misallocation.

This study addressed that gap by estimating a Cobb-Douglas production function for peanut farming in Sone Village. Specifically, it examined how land area, seeds, pesticides, labor, education, farming experience, and capital influence production outcomes, both collectively and individually. By distinguishing significant elasticities from non-significant ones and interpreting negative coefficients as evidence of inefficiency, the findings inform the design of targeted interventions for sustainable intensification in marginal agricultural environments.

METHOD

This research was conducted in Sone Village, Insana Tengah District, North Central Timor Regency, East Nusa Tenggara Province, from September to October 2024. The village was purposively selected based on its status as a primary peanut-producing area within the district, characterized by hilly topography (12 km² total area, 15–40% slopes), rain-fed farming systems, and a monsoonal climate with a wet season from December to March.

The study used primary and secondary data. Primary data were gathered through structured interviews using a detailed questionnaire administered to 40 peanut farmers, covering production inputs, socioeconomic profiles, and farm management practices. Secondary data included village monographs, regional agricultural statistics from the Central Bureau of Statistics (BPS), and production records from the local agricultural extension office for the period 2019–2022.

The population comprised 160 peanut-farming households in Sone Village. The sample size was determined using Slovin's formula with a 10% margin of error, yielding 40 respondents. This approach is commonly used for finite populations when prior variance information is limited (Majdina et al., 2024; Taherdoost, 2017). Simple random sampling was applied to ensure representativeness, with each household having an equal probability of selection (Krejcie and Morgan, 1970; Singh, 2003). Respondents were selected by lottery from the complete household roster provided by the village administration.

Analytical Methods

Production function

Following standard agricultural production theory, this study employed a Cobb-Douglas production function transformed into a log-linear specification, which is widely used in agricultural economics due to its ability to estimate input–output relationships and interpret coefficients as output elasticities (Donthi, 2019; Gautam, 2024; Mandal and Taku, 2024). The functional form is expressed in Equation (1).

$$\ln Y = \ln \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + \epsilon \ldots (1)$$

Where β_0 is the intercept, β_1 through β_7 represent output elasticities of the respective inputs, and ϵ is the error term. Coefficients were estimated using Ordinary Least Squares (OLS) via SPSS 27 and EViews 12. In this double-log specification, each coefficient indicates the percentage change in peanut production resulting from a 1% change in the respective independent variable, ceteris paribus (Acquah, 2016; Donthi, 2019). The dependent variable is peanut production (Y), which is measured as the total yield per farm per planting season in kilograms. The independent variables include land area (X_1), defined as the total area cultivated with peanuts measured in are, and seeds (X_2), which represent the quantity of seeds used in kilograms. Pesticides (X_3) are measured as the total expenditure on pesticides and herbicides in Indonesian Rupiah. Labor (X_4) refers to the total labor input, including both family and hired labor, measured in man-days. In addition, education (X_5) is defined as the number of years of formal schooling completed by the household head, while farming experience (X_6)

represents the number of years the farmer has been engaged in peanut farming. Capital (X_7) is measured as the total production cost incurred during one planting season, excluding land rent, expressed in Indonesian Rupiah.

Classical Assumption Tests

The validity of the OLS estimation was examined through several classical assumption tests, which are commonly applied in regression-based agricultural studies to ensure the reliability of parameter estimates (Mardiatmoko, 2024; Maulidya et al., 2025; Tarigan, 2023). Normality was assessed using the Kolmogorov-Smirnov test on the residuals, where a significance value greater than 0.05 indicates that the residuals are normally distributed (Mardiatmoko, 2024).

Multicollinearity was evaluated using the Variance Inflation Factor (VIF) and tolerance values, with VIF values below 10 and tolerance values above 0.10 indicating the absence of multicollinearity (Mardiatmoko, 2024; Tarigan, 2023). Heteroscedasticity was tested using the Glejser test, where a significance value greater than 0.05 suggests that the model is free from heteroscedasticity. The Glejser method, which involves regressing the absolute residuals on the independent variables, is widely used to detect heteroscedasticity in linear regression models (Alabi et al., 2020; Onifade and Olanrewaju, 2020).

Hypothesis testing was conducted to examine both the simultaneous and partial effects of the independent variables on production. The simultaneous effect was tested using the F-test, where a significance value less than 0.05 indicates that all independent variables jointly influence the dependent variable. Meanwhile, the partial effect was analyzed using the t-test, where a significance value less than 0.05 indicates that an individual independent variable has a significant effect on production, consistent with previous empirical studies in agricultural production analysis (Maulidya et al., 2025).

Income Analysis

Net farm income was calculated using the standard farm income approach, which is widely applied in agricultural economic analysis, particularly in peanut and groundnut farming studies (Abubakari et al., 2019; Patel and Chandrakar, 2022; Tumbel et al., 2025). The income is defined as the difference between total revenue and total cost, formulated in Equation (2).

$$\pi = TR - TC \ldots (2)$$

where π represents net income, TR denotes total revenue obtained from the multiplication of total production and output price, and TC refers to total production cost, consisting of fixed costs and variable costs. This formulation is consistent with previous studies that define total cost as the sum of total fixed cost and total variable cost, and net income as the difference between total revenue and total cost (Alabi et al., 2025; Patel and Chandrakar, 2022).

RESULT AND DISCUSSION

Characteristics of Respondents

The demographic profile of 40 peanut farmers revealed that the majority (50%) were in the age group of 45–54 years, with a mean age of 48.9 years. Educational attainment was generally low: 82.5% had completed only elementary school, yielding a mean of 6.82 years of formal schooling. Family dependency ratio averaged 3.62 persons per household. Notably, 92.5% of respondents had fewer than 10 years of specific peanut-farming experience (mean 9.3 years), indicating that the farming population had limited accumulated tacit knowledge regarding peanut-specific agronomic management.

Classical Assumption Test Results

The Kolmogorov-Smirnov test yielded a test statistic of 0.069 with a Monte Carlo significance value of 0.916 ($p > 0.05$), indicating a failure to reject the null hypothesis that the residuals follow a normal distribution (Table 1). This result confirms that the normality assumption underlying OLS estimation is satisfied, lending validity to subsequent hypothesis testing.

Table 1. Normality test results (kolmogorov-smirnov)

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			40
Normal Parameters[a,b]	Mean		0.0000000
	Std. Deviation		0.29641480
Most Extreme Differences	Absolute		0.069
	Positive		0.069
	Negative		-0.068
Test Statistic			0.069
Asymp. Sig. (2-tailed)[c]			0.200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		0.908
	99% Confidence Interval	Upper Bound	0.916

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Source: Data processed, 2025

The multicollinearity diagnostics showed no evidence of serious collinearity among the independent variables. Tolerance values ranged from 0.172 (Capital) to 0.771 (Education), all exceeding the threshold of 0.10, while VIF values ranged from 1.298 (Education) to 5.817 (Capital), all remaining well below the threshold of 10 (Table 2). These results confirm that the independent variables are sufficiently independent, and the OLS estimates are not distorted by multicollinearity.

Table 2. Multicollinearity test results

Variable	Tolerance	VIF
Land Area (X_1)	0.436	2.291
Seeds (X_2)	0.458	2.185
Pesticides (X_3)	0.186	5.385
Labor (X_4)	0.599	1.670
Education (X_5)	0.771	1.298
Farming Experience (X_6)	0.747	1.338
Capital (X_7)	0.172	5.817
Threshold	***> 0.10***	***< 10***

Source: Data processed, 2025

Table 3. Heteroscedasticity test results (Glejser)

Variable	B	Std. Error	t	Sig.
Land Area (X_1)	-0.158	0.101	-1.566	0.127
Seeds (X_2)	0.114	0.090	1.267	0.214
Pesticides (X_3)	-0.092	0.164	-0.559	0.580
Labor (X_4)	-0.062	0.084	-0.736	0.467
Education (X_5)	-0.142	0.136	-1.048	0.303
Farming Experience (X_6)	-0.017	0.084	-0.196	0.845
Capital (X_7)	0.202	0.161	1.256	0.218
Threshold	–	–	–	***> 0.05***

Note. Dependent variable: Unstandardized Residual.
Source: Data processed, 2025

The Glejser test in Table 3, which regresses the absolute values of the unstandardized residuals on all independent variables, confirmed the absence of heteroscedasticity in the model. All independent variables yielded significance values well above the 0.05 threshold, ranging from 0.127 (Land Area) to 0.845 (Farming Experience), with no variable approaching statistical significance. This indicates that the variance of the error term is constant across all levels of the independent variables, satisfying the homoscedasticity assumption required for reliable OLS estimation. Consequently, the standard errors and significance tests reported in the regression results are valid and unbiased.

Simultaneous Effect Test (F-Test)

The *F*-test confirmed that all independent variables simultaneously exerted a significant influence on peanut production (F-statistic = 6.757; $p = 0.000 < 0.05$). The coefficient of determination (R^2) was 0.596, while the Adjusted R^2 was 0.508, indicating that 50.8% of the variation in peanut production was explained by the model, with the remaining 49.2% attributable to external factors such as climate variability, soil micro-nutrient differences, and unmeasured management practices, as presented in Table 4.

Table 4. F-Test and goodness-of-fit result

Statistic	Value
***R*-squared**	0.596459
Adjusted *R*-squared	0.508184
S.E. of regression	0.327233
***F*-statistic**	6.756859
Prob(*F*-statistic)	0.000060
Durbin-Watson stat	1.536466

Source: Data processed, 2025

Partial Effect Test (t-Test)

The t-test results revealed that land area and farming experience significantly influenced peanut production at the 5% level, while labor and seed use showed marginal significance at the 10% level. In contrast, pesticides, education, and capital did not exert statistically significant effects on production (Table 5). The following subsections discuss the direction and magnitude of each variable's effect in detail.

Table 5. Multiple log-linear regression results

Variable	Coefficient	Std. Error	*t*-Statistic	*p*-value
Constant	6.710	3.446	1.947	0.060
Land Area (X_1)	0.740***	0.196	3.782	0.001
Seeds (X_2)	–0.307*	0.174	–1.765	0.087
Pesticides (X_3)	0.219	0.318	0.688	0.497
Labor (X_4)	0.293*	0.163	1.795	0.082
Education (X_5)	0.238	0.262	0.905	0.372
Farming Experience (X_6)	0.333**	0.163	2.039	0.050
Capital (X_7)	–0.334	0.311	–1.074	0.291

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Dependent variable: Ln(Production).

Source: Data processed, 2025

Discussion of Significant Factors

Land area exhibited the strongest and most significant positive elasticity (β = 0.740; $p = 0.001$). Interpreting within the log-log Cobb-Douglas framework, this result indicates that a 1% increase in cultivated land area yields a 0.74% increase in peanut output, holding other factors constant. This finding is consistent with Tamar and Wadu (2023) and Parikaes et al. (2021), who identified land area as the dominant determinant of peanut production in Eastern Indonesia. The elasticity is inelastic (β < 1.0), revealing diminishing returns to land expansion, an expected outcome given the steep topography and poor soil retention in Sone Village, where additional plots are typically marginal in quality. The predominance of land area reflects the extensive nature of local agriculture; with an average holding of only 0.47 hectares and intercropping systems with maize, farmers rely on horizontal expansion rather than intensification to increase output. Policy interventions should therefore emphasize land consolidation and erosion-control measures to improve the productivity of existing plots rather than clearing additional sloped areas.

Farming experience showed a significant positive elasticity (β = 0.333; $p = 0.050$), meaning that a 1% increase in years of experience (equivalent to approximately 0.1 years given the mean of 9.3 years) raises production by 0.333%. This result supports the tacit knowledge hypothesis in traditional agriculture: experiential learning, indigenous knowledge of local pest cycles, and site-specific timing of planting (December–January) prove more critical than formal schooling in optimizing yield under rain-fed conditions (Tamar and Wadu, 2023). The relatively modest magnitude of the elasticity reflects the limited range of experience in the sample (5–20 years), with the vast majority below 10 years. Unlike multi-generational farming communities where knowledge accumulates over decades, Sone Village's peanut-farming population has relatively shallow experience depth, suggesting that structured farmer-to-farmer extension could accelerate knowledge diffusion and magnify this elasticity.

Discussion of Marginally Significant and Non-Significant Factors

Seed use exhibited a negative coefficient (β = −0.307; $p = 0.087$), indicating a negative association with peanut production at the 10% significance level. Although statistically significant at this level, the negative elasticity is contrary to the theoretically expected positive contribution of seed input. This result may reflect diminishing marginal returns or inefficiency associated with seed quality and use. Farmers in Sone Village predominantly utilize local seeds preserved from previous harvests (82.5% of respondents), with minimal adoption of certified high-yielding varieties. Local seeds may have lower germination performance and greater susceptibility to seed-borne diseases. Consequently, increasing seed quantity without corresponding improvements in seed quality and planting management may result in excessive or uneven plant density, increasing competition for nutrients and water and potentially reducing yields. This finding contrasts with Fonisasi and Hutapea (2019), who reported a positive seed elasticity of 1.765% in Fafinesu Village, where access to certified seeds was greater. The negative elasticity therefore highlights the potential importance of improving access to quality seeds and strengthening local seed systems in Sone Village.

Labor exhibited a positive coefficient (β = 0.293; $p = 0.082$), indicating a positive association with peanut production at the 10% significance level. This suggests that greater labor input may contribute to increased production, although the statistical evidence is weaker than for variables significant at the 5% or 1% levels. Given the predominantly small-scale and low-mechanization farming system in Sone Village, labor remains important for land preparation, planting, crop maintenance, and harvesting. However, the relatively weak statistical significance may indicate that additional labor generates limited productivity gains once essential farming operations have been fulfilled.

Capital exhibited a negative but statistically non-significant coefficient (β = −0.334; $p = 0.291$). This pattern may indicate inefficient capital allocation; whereby additional expenditure is not necessarily directed toward yield-enhancing inputs. In Sone Village, capital is predominantly allocated to durable equipment (sprayers, machetes, and hoes) and pesticide purchases rather than soil amendments, certified seeds, or irrigation infrastructure. The high fixed-cost share of total costs (46.4%, dominated by sprayer depreciation at 41.1%) further suggests substantial investment in equipment relative to the scale of production. This result is consistent with Tamar and Wadu (2023), who identified capital constraints and input-allocation inefficiencies as persistent challenges in smallholder peanut production.

Pesticide use was not statistically significant ($\beta = 0.219$; $p = 0.497$), suggesting that variations in pesticide use were not systematically associated with peanut production in the study sample. This may reflect reactive or inconsistent application practices rather than planned integrated pest management. Education was also statistically non-significant ($\beta = 0.238$; $p = 0.372$), indicating that years of formal schooling were not associated with differences in peanut production after controlling for other production factors. One possible explanation is that formal schooling does not necessarily translate directly into crop-specific agronomic knowledge or management skills, particularly where access to agricultural extension and technical training is limited (Mahmud et al., 2022).

Farm Income Analysis

Despite production inefficiencies, peanut farming in Sone Village generated favorable economic returns (Table 6). Average production reached 1,203.88 kg per farm per season. At a farm-gate price of IDR 4,000 per kilogram (unshelled), total revenue averaged IDR 4,815,500. Total costs averaged IDR 1,065,314, comprising fixed costs (IDR 494,314; 46.4%) and variable costs (IDR 571,000; 53.6%). Consequently, mean net income was IDR 3,750,185 per season, yielding an *R/C* ratio of 4.52.

Table 6. Cost Structure and Income of Peanut Farming (IDR/Season)

Cost Component	Amount (IDR)	Share (%)
Fixed Costs		
Machete depreciation	55,134	5.2
Hoe depreciation	1,055	0.1
Sprayer depreciation	438,125	41.1
Subtotal Fixed	**494,314**	**46.4**
Variable Costs		
Pesticides and herbicides	431,000	40.5
Labor (food/refreshments)	140,000	13.1
Subtotal Variable	**571,000**	**53.6**
Total Costs	**1,065,314**	**100.0**
Total Revenue	**4,815,500**	
Net Income	**3,750,185**	
***R/C* ratio**	**4.52**	

Source: Data processed, 2025

The R/C ratio of 4.52 confirms that every rupiah of production cost generates IDR 4.52 in revenue, indicating that peanut farming in Sone Village is economically viable and profitable under existing conditions. This figure compares favorably with R/C ratios reported in other peanut-farming studies in Eastern Indonesia, where values typically range between 1.5 and 3.0, suggesting that low production costs — driven primarily by family labor and minimal purchased inputs — underpin the relatively high returns despite modest yields. However, the dominance of sprayer depreciation in fixed costs (41.1% of total costs) reveals a capital allocation pattern that prioritizes equipment ownership over variable inputs that directly enhance yield, such as quality seeds or fertilizers. This structural feature is consistent with the regression finding of a negative and non-significant capital elasticity, reinforcing the argument that current capital expenditure in Sone Village does not translate into proportional output gains. Targeted extension programs that redirect farmers' investment toward yield-enhancing inputs while maintaining cost efficiency could therefore substantially improve both productivity and farm income.

CONCLUSION

Peanut production in Sone Village is primarily influenced by land area and farming experience, both of which have significant positive effects on production. Labor also has a positive effect, while seed use has a negative effect, both statistically significant at the 10% level, suggesting that productivity depends not only on input quantity but also on the quality of seed and the efficient utilization of labor. In contrast, pesticides, education, and capital do not significantly affect production. Although the regression results indicate that several production inputs are not utilized optimally, peanut farming remains economically feasible, as indicated by its high R/C ratio. Therefore, efforts to improve productivity should prioritize better land management, improved seed quality, efficient labor utilization, and strengthening farmers' technical knowledge through extension services and knowledge sharing.

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REFERENCES

Abubakari, S., Abdulai, M., Anang, B., 2019. Economic analysis of groundnut production in Tolon District, Ghana. IJIRAD. https://doi.org/10.47762/2019.964x.57

Acquah, H., 2016. Comparing OLS and rank-based estimation techniques. Applied Studies in Agribusiness and Commerce 10, 129–134. https://doi.org/10.19041/apstract/2016/4-5/16

Alabi, O., Ayinde, K., Babalola, O., Bello, H., Okon, E., 2020. Effects of multicollinearity on type I error. Open J. Stat. 10, 664–677. https://doi.org/10.4236/ojs.2020.104041

Alabi, O., Maharazu, I., Mohammed, A., Ajibola, A., Ocheni, A., 2025. Analysis of net farm income and constraints faced by okra farmers. Mustafa Kemal Universitesi Tarim Bilimleri Dergisi. https://doi.org/10.37908/mkutbd.1599662

Badan Pusat Statistik Kabupaten Timor Tengah Utara, 2021. Timor Tengah Utara dalam Angka 2021. BPS, Kefamenanu.

Badan Pusat Statistik Nusa Tenggara Timur, 2024. Nusa Tenggara Timur dalam Angka 2024. BPS, Kupang.

Denpasar, U., Mataram, K., 2024. Analisis penggunaan faktor-faktor produksi terhadap tingkat produksi kacang tanah. Ganec Swara. https://doi.org/10.35327/gara.v18i1.755

Donthi, R., 2019. A glance on the estimation of Cobb-Douglas production functional model. Other Topics Engineering Research eJournal. https://doi.org/10.2139/ssrn.3481486

Fitriani, A., Chamdra, S., Raga, P.M., 2026. Allocative efficiency as a managerial innovation. SEPA 23, 87–99. https://doi.org/10.20961/sepa.v22i2.114530

Fonisasi, M.Y., Hutapea, A.N., 2019. Faktor-faktor yang mempengaruhi produksi kacang tanah di Desa Fafinesu. Agrimor: Jurnal Agribisnis Lahan Kering 4, 4–6. https://doi.org/10.32938/ag.v4i1.565

Gautam, S., 2024. Understanding Cobb-Douglas production function. Journal of Technology & Innovation 2, 75–78. https://doi.org/10.26480/jtin.02.2024.75.78

Gujarati, D.N., 2004. Basic Econometrics, 4th ed. McGraw-Hill, New York.

Ikhsan, S., 2012. Pengukuran Efisiensi Alokatif pada Usaha Pertanaman Kacang Tanah di Kecamatan Sambung Makmur, Kabupaten Banjar. Jurnal Agribisnis Pedesaan 2.

Krejcie, R. V., Morgan, D.W., 1970. Determining Sample Size for Research Activities. Educ. Psychol.

Meas. 30, 607–610. https://doi.org/10.1177/001316447003000308
Mahmud, H., Rauf, A., Boekoesoe, Y., 2022. Faktor-faktor produksi usahatani padi sawah. Agrinesia: Jurnal Ilmiah Agribisnis 6, 96–102. https://doi.org/10.37046/agr.v6i2.15909
Majdina, N.I., Pratikno, B., Tripena, A., 2024. Penentuan ukuran sampel menggunakan rumus bernoulli dan slovin: konsep dan aplikasinya. Jurnal Ilmiah Matematika dan Pendidikan Matematika 16, 73. https://doi.org/10.20884/1.jmp.2024.16.1.11230
Mandal, R., Taku, C., 2024. The Cobb-Douglas production function. Agriculture Archives 4, 43–48. https://doi.org/10.51470/agri.2025.4.1.43
Mardiatmoko, G., 2024. The application of the classical assumption test. JTAM 8. https://doi.org/10.31764/jtam.v8i3.22179
Maulidya, F., Fauzi, M., Ferrianta, Y., 2025. Analysis of factors affecting the production and net income of peanut farmers. European Journal of Agriculture and Food Sciences. https://doi.org/10.24018/ejfood.2025.7.3.901
Ministry of Agriculture, 2023. Statistik tanaman pangan 2023.
Onifade, O., Olanrewaju, S., 2020. Investigating performances of heteroscedasticity tests. Open J. Stat. https://doi.org/10.4236/ojs.2020.103029
Parikaes, I.S., Pellokila, M.R., Klau, F., 2021. Analisis faktor-faktor yang mempengaruhi produksi kacang tanah. Buletin Ilmiah IMPAS 22, 152–161.
Patel, P., Chandrakar, M., 2022. Cost and return analysis of groundnut cultivation. Agricultural Science Digest. https://doi.org/10.18805/ag.d-5580
Risma, W., Gafaruddin, A., Arif, L., 2024. Pengaruh luas lahan, benih, tenaga kerja, herbisida, dan pengalaman terhadap produksi kacang tanah. Jurnal Ilmiah Membangun Desa dan Pertanian. https://doi.org/10.37149/jimdp.v9i2.105
Sinabariba, F., Prasmatiwi, F., Situmorang, S., 2014. Analisis efisiensi produksi dan pendapatan usahatani kacang tanah. Jurnal Ilmu-Ilmu Agribisnis 2, 316–322. https://doi.org/10.23960/jiia.v2i4.316-322
Singh, S., 2003. Simple Random Sampling, in: Advanced Sampling Theory with Applications. Springer Netherlands, Dordrecht, pp. 71–136. https://doi.org/10.1007/978-94-007-0789-4_2
Sukartawi, 2003. Teori ekonomi produksi dengan pokok bahasan analisis fungsi Cobb-Douglas. IPB Press, Jakarta.
Taherdoost, H., 2017. Determining sample size. Leadership & Organizational Behavior eJournal.
Tamar, D.M., Wadu, J., 2023. Analisis faktor-faktor yang mempengaruhi produksi usahatani kacang tanah. SATI 1, 27–28.
Tarigan, P., 2023. Analisis asumsi klasik terhadap produktivitas tenaga kerja. Agriprimatech. https://doi.org/10.34012/agriprimatech.v7i1.4244
Tumbel, R., Benu, N., Loho, A., 2025. Analisis pendapatan usahatani kacang tanah berbasis ekoenzim. Jurnal Agribisnis dan Pengembangan Pedesaan. https://doi.org/10.35791/agrirud.v7i2.61709