

DETERMINANTS OF THE REGIONAL FOOD SECURITY INDEX FOR DISTRICTS AND MUNICIPALITIES IN CENTRAL JAVA PROVINCE

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Article Information: Received – June 25, 2026, Published August 10, 2026

Abstract

Food security is a key aspect of regional development, particularly in efforts to achieve the Sustainable Development Goals (SDGs). Although the Food Security Index (FSI) in Central Java is categorized as very resilient, disparities in its determining indicators, such as declining rice production, relatively high poverty rates, and the on going prevalence of stunting, highlight the need to examine its key determining factors. This study aims to analyze the influence of rice production, the percentage of the poor population, and the prevalence of stunting on the Food Security Index across 35 regencies and cities in Central Java during 2018–2024. Rice production represents the availability dimension, whilst poverty reflects food accessibility, and stunting indicates food utilization. This study utilized panel data regression with the most appropriate fixed-effects model (FEM). The results indicate that rice production has a negative effect on the Food Security Index, although the effect is significant. Furthermore, the percentage of the poor population and the prevalence of stunting have significant negative effects on the Food Security Index. Among these variable rice production is identified as the dominant factor influencing food security, as Central Java Province has already implemented food diversification, as reflected in the Dietary Patterns data, thereby reducing its reliance on rice alone.

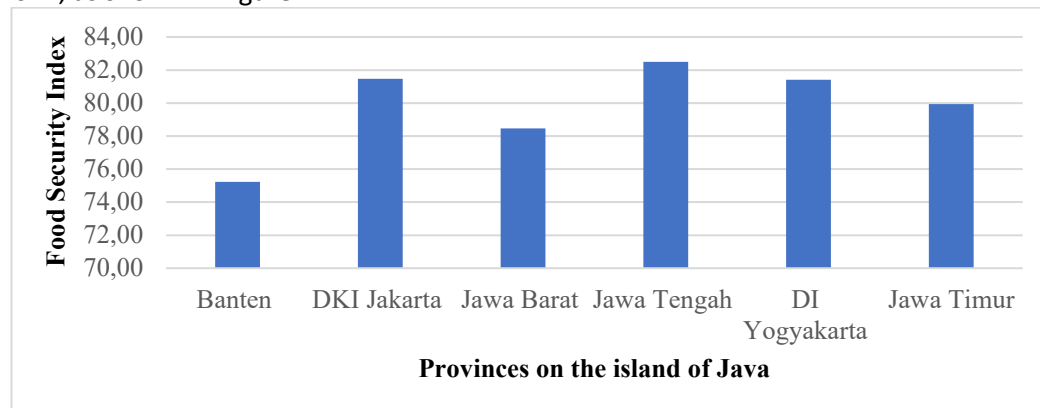
Keywords: Food Security Index; Rice Production; Poverty; Stunting

INTRODUCTION

One of the five missions in the National Long-Term Development Plan (RPJPN) 2025–2045 emphasizes strengthening social, cultural, and ecological resilience through the achievement of energy security, water security, and food self-sufficiency (Bapanas, 2023). This is in line with the second SDGs, Zero Hunger, which aims to end hunger, improve nutrition and achieve food security by 2030. One of the key measures for achieving this goal is the development of sustainable food production systems and the adoption of resilient agricultural practices to boost yields and productivity (UNDP, 2022).

Indonesia ranks 10th in the Food Security Index out of 23 countries in the Asia-Pacific region. This result reflects a fairly strong performance in the food security pillar, although there are still weaknesses in the areas of sustainability and adaptive capacity (Agriscience, 2022). This situation is underpinned by the contribution to food security made by all provinces in Indonesia, particularly those on the island of Java, which serve as the nation's breadbasket (BPS, 2026). As well as being a hub of urban development, Java is also characterised by a productive agricultural sector (Andrianto, 2023). Central Java Province is among the regions with a relatively high level of food security

compared to other provinces. This is reflected in the average Food Security Index (FSI) scores for 2018–2024, as shown in Figure 1.



Source: National Food Agency (2024)

Figure 1. Average Provincial Food Security Index for Java from 2018 to 2024

Improvements in the Food Security Index (FSI) are influenced by various factors that make up the dimensions of food security. In terms of food availability, the key indicator in Central Java is the volume of rice production in each regency and city. According to Wati and Faridatussalam (2024), as a staple food, rice plays a vital role in economic, environmental, social and political spheres. Between 2018 and 2024, rice production in Central Java showed a downward trend. This situation presents a research paradox, as on the one hand Central Java has achieved a relatively high Human Development Index (HDI), yet on the other hand rice production a key indicator of food security has actually declined

Food availability is the foundation of food security, but it does not necessarily guarantee that people are able to access food at an affordable price. Therefore, the issue of food affordability must be taken into account; one indicator of this is the percentage of the population living in poverty (Mukhlis et al., 2021). High levels of poverty can limit people's ability to afford sufficient and nutritious food, thereby potentially undermining the quality of regional food security (Gomina et al., 2024). This situation is consistent with the theory of the Vicious Circle of Poverty (Nurkse, 1958) explains that low income leads to low productivity and a cycle of poverty. The percentage of the population living in poverty in Central Java in 2024 remains at 10.12%, higher than the national average of 8.8% (BPS, 2024). This situation presents a paradox: although Central Java's Human Development Index (HDI) is relatively high, the indicator of food affordability as reflected in poverty levels remains relatively high.

The dimension of food utilisation is one of the key factors in determining the Food Security Index (FSI), one of whose indicators is reflected in the prevalence of stunting. Stunting indicates that food utilisation is not yet optimal, as the population's nutritional needs are not being adequately met. This situation is consistent with endogenous growth theory (Romer, 2008) which emphasises the importance of human capital in driving economic development. The prevalence of stunting remains relatively high in Central Java TP2S (2021). Although the Food Security Index (FSI) is in the high category, the prevalence of stunting remains relatively high, despite showing a downward trend. This indicates that progress in achieving food security has not yet been fully accompanied by improvements in the population's nutritional status.

Empirically, all regencies and cities in Central Java have been classified as 'highly resilient' on the Food Security Index (FSI), though some of the underlying indicators are not yet fully aligned. In terms of food availability, rice production for the 2018–2024 period has tended to fluctuate with a downward trend, whilst the average FSI score has actually increased. In the food accessibility dimension, the percentage of the poor population in 2024 remains at 10.12%, higher than the national average of 8.8%. In the food utilisation dimension, the prevalence of stunting remains at

18.12%, although lower than the national average of 19.8%. This phenomenon presents a paradox: a high FPI, yet rice production is declining, poverty remains relatively high, and stunting persists.

The main research question in this study is whether the variables of rice production, population percentage and stunting prevalence influence the Food Security Index, and which indicators are most significant in determining the Food Security Index for districts and cities in Central Java Province for the period 2018–2024. Therefore, this study is important for providing an empirical basis for the formulation of more targeted, effective and sustainable policies, whilst also serving as a reference for other regions in strengthening their own food security.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

In line with Amartya Sen's Capability Approach (1999), food security is understood as the result of the interaction between food availability, access and utilisation, which reflects the expansion of individual capabilities. The production aspect relates to the availability dimension, which in this study is represented by rice production as the primary food commodity in Indonesia. An increase in rice production indicates that the physical availability of food in a region is becoming more secure, thereby serving as a key foundation for achieving food security. Furthermore, capability is reflected in the community's ability to access food, which in this study is measured using the percentage of the population living in poverty. High poverty rates indicate limited purchasing power, thereby restricting access to food. The utilisation dimension relates to the quality of human resources, which in this study is measured using the prevalence of stunting. High stunting rates indicate that the community is not yet able to meet its nutritional needs. Thus, these three variables are integrated into the conceptual model of availability, access and utilisation, whereby rice production, poverty and stunting can influence the Food Security Index (FSI) through the mechanism of expanding community capability.

Within the framework of the Capability Approach according to Amartya Sen (1999), Food security is understood as the result of the interaction between food availability, access, and utilization, reflecting the expansion of individual capabilities. The production aspect relates to the availability dimension, which in this study is represented by rice production as the primary food commodity in Indonesia. Increased rice production indicates a growing assurance of the physical availability of food in a region, thereby serving as the primary foundation for achieving food security.

Nurkse's Theory of the Vicious Cycle of Poverty (1958) explains that a high percentage of the population living in poverty can affect people's purchasing power. This, in turn, affects their ability to access food. People living in poverty have limited purchasing power, making it difficult for them to obtain sufficient, safe, and nutritious food. This situation can lead to increased food insecurity and a decline in a region's food security.

According to endogenous growth theory, low human capital quality can hinder economic growth and development. One factor that can affect human capital quality is the occurrence of stunting. High stunting prevalence indicates limitations in meeting the community's nutritional and health needs, which can ultimately reduce the quality of the future workforce. These conditions can affect economic productivity and the community's ability to improve their well-being. Therefore, efforts to reduce stunting rates through improved nutrition, increased access to food, and enhanced quality of health services are crucial components in supporting economic development and strengthening a region's food security.

Based on the theories and conceptual frameworks presented above, the research hypothesis is formulated as follows:

1. Rice Production

Rice production has a positive effect on the Food Security Index; when rice production increases, the Food Security Index also increases. Rice production has been shown to have a positive

and significant effect on the Food Security Index in studies by Hannida dan Sambodo (2025), Whantouw et al., (2021) dan Be, Emanuel (2022).

H₁: Rice production has a positive effect on the Food Security Index in the regencies and cities of Central Java Province

2. Poor Population

The high percentage of the population living in poverty indicates that a portion of the population lacks the purchasing power to obtain sufficient and nutritious food. Research by Whantouw et al., (2021), Budiawati (2024), Putra (2025), Evalia et al., (2025) and Nurseptiana & Fresti (2026) found that the poverty rate variable has a negative effect on the Food Security Index.

H₂: The poor population has a negative effect on the Food Security Index in the regencies and cities of Central Java Province

3. Prevalence of Stunting

High stunting rates indicate that food utilization is not yet optimal, which can lower food security levels, particularly in the dimension of food utilization. Research by Azhar (2023) and Budiawati (2024) found that the stunting prevalence variable has a negative effect on the Food Security Index.

H₃: Prevalensi The prevalence of stunting has a negative effect on the Food Security Index in the regencies and cities of Central Java Province

4. The Most Dominant Factor Influencing the Food Security Index

Conceptually, the percentage of the poor population is believed to be the most dominant factor influencing the Food Security Index because it is directly related to the community's ability to access food. Although food availability is met through rice production, high poverty levels can limit the community's ability to obtain adequate food.

H₄: The most influential factor related to the poor population on the Food Security Index in the regencies and cities of Central Java Province

RESEARCH METHODS

The research method used in this study aims to analyze the influence of factors from the three dimensions of food security namely, rice production, the poor population, and the prevalence of stunting on the Food Security Index. This section is divided into four parts.

1. Research Design

The type of research used is quantitative research. Creswell (2014) states that quantitative research is a research approach that emphasizes the process of collecting, processing, and analyzing data presented in numerical form (Hildawati et al., 2024). The quantitative approach was used to analyze the influence of rice production, the percentage of the poor population, and the prevalence rate of stunting on the Food Security Index at the regency/city level in Central Java Province.

2. Population and Sample

The object of this study is the Food Security Index at the regency/city level in Central Java Province. This study examines the influence of variables namely rice production, the percentage of the poor population, and the prevalence rate of stunting on the Food Security Index. These three variables were selected because they represent three important dimensions of food security: availability, accessibility, and utilization of food. The data analyzed covers the period 2018–2024, as Food Security Index data has been available since 2018.

3. Data Collection Methods and Instrument Development

In this study, data were obtained from the official websites of the National Food Agency, the Central Statistics Agency, and the Stunting Reduction Acceleration Team.

Tabel 1. Data Sources

Variable	Source
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Food Security Index	National Food Agency
Rice production	BPS-Statistics Indonesia
Poor Population	BPS-Statistics Indonesia
Prevalence of Stunting	Tim Percepatan Penurunan Stunting

Source: Bapanas (2024), BPS (2024) dan TP2S (2024)

This study used EViews 13 software as a statistical analysis tool. The software was used to process panel data, conduct assumption tests, and estimate the most appropriate regression model. EViews 13 allows for the efficient handling of large amounts of data and provides various analysis features suitable for exploring relationships between variables from a temporal and spatial perspective.

4. Data Analysis Techniques

This study employs panel data analysis, which combines time-series data with cross-sectional data over a seven-year observation period, from 2018 to 2024. Meanwhile, the cross-sectional data covers 35 regencies/cities in Central Java Province. The total number of observations used in this study is 245. The following is the formulation of the panel data regression equation using the semi-natural logarithm for this study:

$$IKP_{it} = \alpha + \beta_1LNPB_{it} + \beta_2PPM_{it} + \beta_3PS_{it} + \varepsilon$$

Keterangan:

- LN

=

Logaritma Natural
- IKP

=

Food Security Index
- α

=

Intercept coefficient (Constant value) / alpha
- $\beta_1, \beta_2, \beta_3$

=

Regression coefficients for each variable
- PB

=

Rice Production
- PM

=

Poor Population
- PS

=

Stunting Prevalence
- ε

=

Galat or Error Terms
- i

=

Cross-Section Unit: Regencies/Cities in Central Java
- t

=

Time Series Unit: 2018–2024

In panel data regression analysis, there are three main approaches used to estimate model parameters: the Common Effects model, the Fixed Effects model, and the Random Effects model. The Common Effects model is the simplest approach in panel data regression because it assumes that all observation units share homogeneous characteristics. This model is estimated using the Ordinary Least Squares (OLS) method (Gujarati & Porter, 2009). The fixed-effects model is used when there are constant differences in characteristics across units. This model accounts for unobserved heterogeneity across individual units by including individual effects in the regression model (Gujarati & Porter, 2009). A random-effects model is used when differences across observation units are considered random and uncorrelated with the independent variables. This model assumes that differences across individuals are part of the error term in the regression model (Gujarati & Porter, 2009).

RESULTS AND DISCUSSION

1. Panel Data Regression Model Selection

The Chow test result of 0.000 (< 0.05) and the Hausman test result of 0.000 (< 0.05) indicate that the Fixed Effects Model (FEM) is the most appropriate model for the analysis, so the Lagrange Multiplier test is not required.

2. Tests of Classical Assumptions

a. Multicollinearity Test

Tabel 2. Uji Multikolinearitas

Variabel	LNPB	PM	PS
LNPB	1,000	0,458	0,125
PM	0,458	1,000	0,212
PS	0,125	0,212	1,000

Source: Eviews data analysis results (2026)

The multicollinearity test results presented in Table 4.3 show that the correlation values between independent variables are below 0.80. Thus, the regression model used is free from multicollinearity issues (Johnson & Wichern, 2013).

b. Heteroscedasticity Test

Tabel 3. Heteroscedasticity Test

Variabel	Probabilitas
PB	0,20
PM	0,13
PS	0,70

The results of the heteroscedasticity test indicate that none of the independent variables used in the regression model exhibit heteroscedasticity.

3. Panel Data Regression Model Estimation

The best panel data regression model used in this study is the Fixed Effects Model (FEM). The following is a summary of the estimation results from this model.

Tabel 4. Model FEM

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	148,4	15,33	9,676	0,000
lnPB	-4,366	1,433	-3,045	0,002
PM	-1,061	0,335	-3,161	0,001
PS	-0,255	0,032	-7,908	0,000
R-squared	0,8114			
Adjusted R-squared	0,7777			
F-statistic	24,07			0,000

Source: Eviews data analysis results (2026)

Based on the statistical output in Table 4, the estimated regression equations are as follows:

$$IKP_{it} = 148.4 - 4.366\ln PB_{it} - 1.061PM_{it} - 0.255PS_{it}$$

Based on the regression equation model, the analysis results can be interpreted as follows:

a. Konstanta

The constant of 148.4 in the regression model represents the baseline value of the Food Security Index (FSI) when all independent variables namely, rice production, the number of people living in poverty, and the prevalence of stunting are set to zero. This constant serves as the starting point for FSI predictions before accounting for the effects of other variables.

b. Rice Production

The regression coefficient for rice production is -4.3666, meaning that for every 1 percent increase in rice production, the FRI decreases by 4.366 units.

c. Poor Population

The regression coefficient for the poor population is -1.0619, which means that for every 1% increase in the poor population, the IKP decreases by 1.0619 units.

d. Stunting Prevalence

The regression coefficient for stunting prevalence is -0.2553. This indicates that for every 1% increase in stunting prevalence, the HDI will decrease by 0.2553 units.

4. Coefficient of Determination

Based on the estimation results in Table 4, the R-squared value was found to be 0.81, or 81 percent. This value indicates that 81% of the variation in the IKP in Central Java Province can be explained by the variables of rice production, the percentage of the poor population, and the prevalence of stunting. Meanwhile, the remaining 19% is explained by other variables outside the scope of this study.

5. Hypothesis Test

a. F test

Based on the statistical output, an F-statistic value of 24.0757 was obtained with a probability value (Prob F-statistic) of 0.0000. Therefore, since the probability value is far smaller than the significance level of 0.05 ($0.0000 < 0.05$), it can be concluded that the variables of rice production, the poor population, and the prevalence of stunting collectively have a significant effect on the Food Security Index in the regencies and cities of Central Java Province.

b. T tes

The t-test is used to test the effect of each independent variable individually on the dependent variable. Based on the results of the data analysis, the following is an interpretation of the effect of each variable:

1. Variable Rice Production

The rice production variable has a coefficient value of -4.3666 with a probability value of 0.0026. Since the probability value is < 0.05 , rice production has a partial negative and significant effect on the IKP. Thus, H_0 is accepted and H_1 rejected.

2. Variable Poor Population

The poor population variable has a coefficient value of -1.0618 with a probability value of 0.0018. A probability value smaller than 0.05 ($0.0018 < 0.05$) indicates that the poor population variable has a partial, negative, and significant effect on the FPI. This suggests that any increase in the number of people living in poverty will significantly lower the food security score. Thus, H_0 is rejected and H_2 is accepted.

3. Variable Stunting Prevalence

The stunting prevalence variable has a coefficient of -0.2553 with a probability value of 0.0000. Given that the probability value is < 0.05 , it can be concluded that stunting prevalence has a partial negative and significant effect on the FSI. This indicates that reducing stunting rates is a key factor in improving the food security index. Thus, H_0 is rejected and H_3 is accepted.

The following is a discussion of the research results:

(1) The Effect of Rice Production on the Food Security Index

Panel data regression results indicate that rice production has a negative and significant effect on the Food Security Index of districts and cities in Central Java Province. This finding suggests that food security is not determined solely by rice production as a staple food commodity, but is also influenced by food diversification and food distribution. This is consistent with Yuniarti et al. (2022), who state that food diversification can improve household food security. The relatively high Central Java Food Consumption Index of 91 for

2019–2024 (Dishanpan, 2024) also indicates that the public's food consumption in Central Java Province is becoming increasingly diverse, nutritious, and balanced. Thus, even though rice production is declining, the Food Security Index can still improve because the public has access to various other food sources. Additionally, equitable food distribution including the transfer of stocks from surplus areas to deficit areas helps maintain food availability. From a Cobb-Douglas theoretical perspective, a decline in rice production may reflect constraints in production inputs such as land, labor, and technology; however, food security can still be maintained through food diversification, production efficiency, and effective distribution.

(2) The Impact of the Poor Population on the Food Security Index

The poor population has a significant negative impact on the Food Security Index (FSI) of districts and cities in Central Java Province. This means that a decrease in the number of poor people tends to increase the FSI, while an increase in the poor population can lower the FSI. This occurs because poverty limits households' purchasing power and their access to sufficient, nutritious, and diverse food. Additionally, limitations in human capital, skills, and economic opportunities make it difficult for the poor to increase productivity or independently secure alternative food sources. Areas with a high proportion of the poor, such as Brebes and Cilacap, tend to have a lower FSI compared to areas with lower poverty rates. This finding aligns with the theory of the Vicious Circle of Poverty, which explains that low income limits consumption of food, health services, and education, thereby creating a cycle of poverty that hinders food security, and vice versa. These research results are also consistent with Hannida dan Sambodo (2025), Putra (2025) and Budiawati (2024), who state that poverty has a significant negative effect on the FSI.

(3) The Effect of Stunting Prevalence on the Food Security Index

The results of the panel data regression indicate that the prevalence of stunting has a significant negative effect on the Food Security Index (FSI) of districts and cities in Central Java Province. This means that a decrease in the prevalence of stunting tends to increase the FSI, while an increase in the prevalence of stunting can decrease the FSI, as stunting reflects poor food utilization and nutrition among the population. Based on the average over the study period, the highest prevalence of stunting was found in Pemalang District, followed by Tegal City, Banjarnegara District, and Kebumen District. This situation indicates challenges in food utilization, particularly regarding access to health services, clean water, and child-rearing practices that prioritize nutrition. Conversely, urban areas such as Semarang City, Surakarta City, and Salatiga City have lower stunting prevalence due to better access to food, health services, and a more favorable environment. This phenomenon aligns with the Endogenous Human Capital theory, which emphasizes that investment in education and health plays a crucial role in improving the quality of human capital and economic productivity. Thus, reducing stunting is a key priority for strengthening human capital quality and supporting improvements in the Human Development Index (HDI). These findings are consistent with those of Azhar et al., (2023) & Budiawati (2024), who found that the prevalence of stunting has a significant negative effect on the IFS.

(4) The Most Dominant Factors in Determining the Food Security Index of Regencies/Cities in Central Java Province

Rice production is the most dominant factor affecting the Food Security Index in Central Java Province; as shown in Table 4, the coefficient value for the rice production variable is the highest. Rice is the primary staple commodity consumed by the majority of the population, so its production reflects regional food availability. This is consistent with Prabayanti et al. (2022), as well as Samantha (2026) and Dinkominfo Jateng (2024), who state that Central Java is one of the provinces supporting national rice production and plays a crucial role in national food security. However, food security is determined not only by physical production but also by economic and structural factors, such as economic growth, access to food, prices, and food distribution (Asim & Rehman, 2024). The relatively high Central Java Food Consumption Index of 91 for 2019–2024 (Dishanpan, 2024), indicates that the public's food consumption is becoming increasingly diverse, nutritious, and balanced. Therefore, although rice production is the dominant variable, the negative direction of the coefficient in the regression can be explained by the role of non-production factors, particularly food distribution and access, which also determine the FPI achievement.

CONCLUSION

Research findings indicate that rice production has a significant negative impact on the Food Security Index (FSI) in the regencies and cities of Central Java Province during the 2018–2024 period. This suggests that a decline in rice production, in the context of Central Java Province which has implemented food diversification may actually improve the FSI because the population is not solely dependent on rice. This is reflected in the high PPH value in Central Java. Additionally, the percentage of the poor population and the prevalence of stunting also have a significant negative impact on the FSI, indicating that increases in poverty and stunting can reduce food security, and vice versa. Overall, rice production is the most dominant factor, confirming that variations or changes in the volume of rice production have the greatest impact on the FSI compared to other factors.

This study has limitations, as it uses only three variable rice production, percentage of the poor population, and prevalence of stunting to represent the three main dimensions of food security for the 2018–2024 period, due to data limitations. Future research is recommended to use up to twelve indicators covering the three dimensions of food security availability, accessibility, and utilization of food to clarify the dominant factors influencing the Food Security Index (FSI) in the 35 regencies and cities of Central Java Province.

BIBLIOGRAPHY

- Agriscience, C. (2022). *Country Report: Indonesia, Global Food Security Index 2022*. The Economist Newspaper Limited 2022. Corteva Agriscience.
- Andrianto, A. D. (2023). Transformasi Pertanian Masa Orde Baru dalam Mewujudkan Kemandirian Pangan. *Jurnal Sosial Ekonomi Pertanian*, 11(2), 14–20. Diakses dari https://www.researchgate.net/profile/Agus-Andrianto-3/publication/376033179_Transformasi_Pertanian_Masa_Orde_Baru_dalam_Mewujudkan_Kemandirian_Pangan/links/6567c4143fa26f66f439c4eb/Transformasi-Pertanian-Masa-Orde-Baru-dalam-Mewujudkan-Kemandirian-Pangan.

- Asim, H., & Rehman, H. (2024). Panel Quantile Approach towards Exigent Determinants of Food Security in the Selected Developing Countries. *Pakistan Journal of Humanities and Social Sciences*, 12(1), 612–626. Doi: 10.52131/pjhss.2024.v12i1.2063
- Azhar, A. L., Suliyanto, Chamidah, N., Ana, E., & Amelia, D. (2023). Pemodelan Indeks Ketahanan Pangan di Indonesia Berdasarkan Pendekatan Regresi Logistik Ordinal Data Panel Efek Acak. *Jurnal Ketahanan Nasional*, 29(2), 166–177. Doi: 10.22146/jkn.86511
- Bapanas. (2024). *Indeks Ketahanan Pangan Kab/Kota 2024*. Badan Pangan Nasional. <https://data.badanpangan.go.id/datasetpublications/xi/indeks-ketahanan-pangan-kab-kota>
- Badan Perencanaan Pembangunan Nasional. (2023). *Undang-Undang No 59 Tahun 2024 tentang Rencana Pembangunan Jangka Panjang Nasional Tahun 2025-2045*. Diakses dari <https://indonesia2045.go.id/>
- Be, E. (2022). Impact Of Rice Production, Rice Supply and Rice Prices On Food Security In North Timor District. *Jurnal Manajemen Dan Agribisnis*, 19(3). Doi: 10.17358/jma.19.3.407
- BPS. (2024). *Persentase Penduduk Miskin (P0) Menurut Provinsi dan Daerah (Persen)*. Badan Pusat Statistik. Diakses dari <https://www.bps.go.id/id/statistics-table/2/MTkylzl=/persentase-penduduk-miskin--p0--menurut-provinsi-dan-daerah.html>
- BPS, J. (2026). *Data BPS Perkuat Peran Jawa Tengah sebagai Lumbung Pangan Nasional*. BPS Jawa Tengah. Diakses dari <https://jateng.bps.go.id/id/news/2026/03/06/1146/data-bps-perkuat-peran-jawa-tengah-sebagai-lumbung-pangan-nasional.html>
- Budiawati, Y. (2024). Hubungan Antara Karakteristik Sosial Ekonomi dan Status Kesehatan Balita Terhadap Ketahanan Pangan di Provinsi Banten. *Jurnal Ilmu Pertanian Tirtayasa*, 6(2), 407–417.
- Dishanpan. (2024). *Skor Pola Pangan Harapan (PPH) Jawa Tengah*. Portal Data Jawa Tengah. Diakses dari <https://data.jatengprov.go.id/dataset/67e-skor-pola-pangan-harapan-pph-jawa-tengah>
- Evalia, N. A., & Dkk. (2025). Faktor- Faktor yang Mempengaruhi Ketahan Pangan di Sumatera Barat. *Jurnal Mahasiswa Humanis*, 5(2), 937–948.
- Gomina, K. S., Gomina, O. E., Egbubine, L., Anyanaso, C., Ilesanmi, S., & Obunukwu, G. M. (2024). Analyzing the intersection between food security and poverty status among households. *World Journal of Advanced Engineering Technology and Sciences*, 12(2), 307–317. Doi: 10.30574/wjaets
- Hannida, C. P., & Sambodo, H. (2025). Analysis Of The Effect Of Rice Production, Poverty, And Prevalence Of Undernourishment (POU) On Food Securty In Indonesia. *SEPA Jurnal Sosial Ekonomi Pertanian Dan Agribisnis*, 22(1), 11–19.
- Hildawati, Suhirman, L., Prisuna, B. F., Husnita, L., Mardikawati, B., Setiawan, H., & Sroyer, A. M. (2024). *Buku Ajar Metodologi Penelitian Kuantitatif & Aplikasi Pengolahan Analisa Data Statistik* (Efitra (ed.); Pertama). PT. Sonpedia Publishing Indonesia.
- Jateng, Di. (2024). *Dibantu 10 Ribu Alsintan, Pj Gubernur Jateng Optimistis Produksi Pangan Meningkat*. Dinas Komunikasi Dan Informatika Provinsi Jawa Tengah. Diakses dari

<https://jatengprov.go.id/publik/dibantu-10-ribu-alsintan-pj-gubernur-jateng-optimistis-produksi-pangan-meningkat/>

Johnson, R. A., & Wichern, D. W. (2013). *Applied Multivariate Statistical Analysis* (Sixth). Pearson New International Edition.

Mukhlis, I., Gürçam, Ö. S., & Hendrati, I. M. (2021). Poverty And Food Security : A Reality in ASEAN Countries. *Jurnal Ekonomi Dan Studi Pembangunan*, 13(1), 1–15. Diakses dari www.frontiersin.org

Nurkse, R. (1958). *Problems Of Capital Formation In Underdeveloped Countries* (Sixth).

Nurseptiana, L., & Fresti, I. (2026). Analysis Of The Determinants Of Food Security In Indonesian Provinces, 2020-2024. *JHSS (Journal of Humanities and Social Studies)*, 10(01), 383–392. Doi: 10.33751/jhss.v10i1.49

Prabayanti, H., Sutrisno, J., & Antriandarti, E. (2022). View of Determinan Ketahanan Pangan di Provinsi Jawa Tengah. *Jurnal Pangan Bulog*, 31(191–198). Diakses dari <https://www.jurnalpangan.com/index.php/pangan/article/view/629/466>

Putra, A. M. (2025). Ketahanan Pangan di Tengah Tekanan Lingkungan dan Pertumbuhan Penduduk: Analisis Data Panel provinsi di Indonesia Tahun 2019-2022. *Ekopedia : Jurnal Ilmiah Ekonomi*, 1(4), 3503–3514. Doi: 10.63822/zfez5a88 Hal.

Romer, P. M. (2008). Increasing Returns and Long-Run Growth. *The Journal Of Political Economy*, 94(5), 1002–1037.

Samantha, Y. (2026). Peran Daerah Basis Produksi Padi Dalam Mendukung Ketahanan Pangan Regional : Analisis Location Quotient (LQ) Provinsi Jawa Tengah. *Jurnal Agrifitia*, 6(01), 66–74. Doi: 10.55180/aft.v6i1.2376

Stunting, T. (Tim P. P. S. S. W. P. (2021). *Masalah Gizi Pada Balita*. Sekretariat Wakil Presiden. <https://dashboard.stunting.go.id/masalah-gizi-pada-balita/>

UNDP. (2022). *Indonesia SGD Snapshot*. Diakses dari <https://www.undp.org/indonesia/publications/2022-annual-report-snapshot-key-progress-and-achievements-indonesia>

Wati, B. C., & Faridatussalam, S. R. (2024). Analysis of Rice Availability in Central Java Province 2018-2022. *Jurnal Ilmu Manajemen Profitability*, 8(2). Diakses dari <https://journal.unismuh.ac.id/index.php/profitability>

Whantouw, D. valentino, Kindangen, P., & Walewangko, E. N. (2021). Analisis Faktor-Faktor Yang Mempengaruhi Tingkat Ketahanan Pangan di Propinsi Sulawesi Utara. *Jurnal Pembangunan Ekonomi Dan Keuangan Daerah*, 22(3), 132–151.

Yuniarti, D., Purwaningsih, Y., Soesilo, A. M., & Suryantoro, A. (2022). Food Diversification and Dynamic Food Security : Evidence from Poor Households. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, 23(1), 43–55. Doi: 10.23917/jep.v23i1.16302