

DETERMINANTS OF FOOD SECURITY IN THE FORMER BARLINGMASCAKEB REGION

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Abstract

This study aims to analyze the factors influencing food security in the former Barlingmascakeb region during 2018–2024. Food security is measured using the Food Security Index (FSI), with independent variables consisting of UMK, population size, and rice prices on the demand side, as well as rice production, rainfall, and government spending on agriculture on the supply side. Using panel data from five regencies/cities over seven years (35 observations), the study applies panel data regression with the Common Effect Model (CEM) using EViews 12. The results show that all independent variables simultaneously significantly affect food security. Partially, UMK and rainfall have positive and significant effects, while rice prices have a negative and significant effect. Population size, rice production, and government agricultural spending have no significant effect. The R^2 of 0.8662 indicates that 86.62% of the variation in food security is explained by the model. These findings highlight the importance of household purchasing power, food price stability, and climatic conditions in strengthening food security through policies supporting income growth, food price control, and sustainable natural resource management.

Keywords: food security, supply and demand, minimum wage, rice prices, rainfall

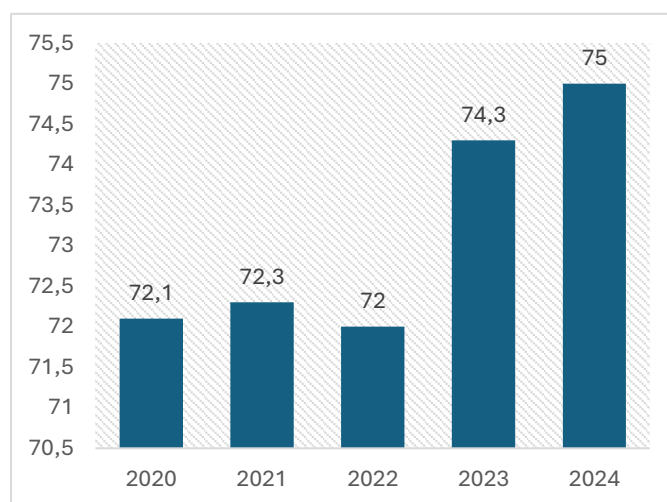
INTRODUCTION

Food security is one of the fundamental issues in economic development because it is closely related to meeting basic human needs, improving the quality of human resources, and ensuring the social and economic stability of a region. Food is not only understood as an economic commodity but also as a basic right of every individual that must be fulfilled to support human survival (Farid et al., 2018). According to Law No. 18 of 2012 on Food, food is defined as anything derived from biological sources that is intended as food or drink for human consumption. Therefore, meeting food needs is a vital component of national development because it is directly linked to the quality of life of the population. According to the Food and Agriculture Organization of the United Nations (2025), food security is a state in which all members of society have physical, social, and economic access to sufficient, safe, and nutritious food to lead active and healthy lives. This definition emphasizes that food security is influenced not only by food availability but also by food affordability and utilization. Thus, food security is a multidimensional concept influenced by socioeconomic, demographic, and environmental factors.

From the perspective of Marshall's (1890) theory of supply and demand, food security is influenced by the balance between the demand side and the supply side. On the demand side, food security is influenced by the public's ability to obtain food, which is related to purchasing power, population size, and food prices. On the supply side, food security is influenced by food production capacity, environmental conditions, and government policy support for the agricultural sector. An imbalance between these two sides can lead to disparities in food security across regions.

Therefore, a region's food security is not only determined by high food production but is also influenced by the community's ability to access adequate food supplies.

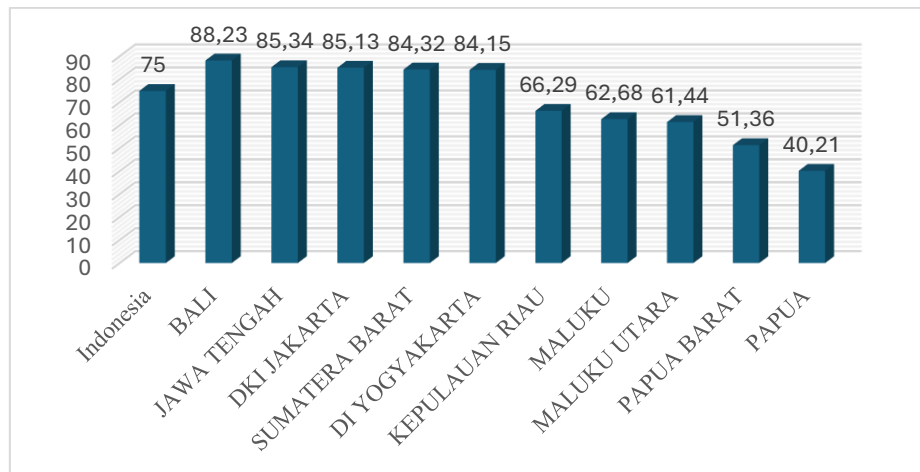
Based on this approach, this study uses the Regency/City Minimum Wage (UMK), population size, and rice prices as demand-side factors, while rice production, rainfall, and government spending on the agricultural sector are used to represent supply-side factors in explaining regional food security conditions. The UMK variable was chosen because it reflects the public's purchasing power for food needs; the higher the income, the greater a household's ability to meet its consumption needs (Rahmawati & Arif, 2023). Population size was used because population growth can increase total food demand (Khairati & Syahni, 2016). Meanwhile, the price of rice reflects the affordability of staple foods; an increase in rice prices can reduce the public's access to food, thereby leading to a decline in food security (Aissiyah & A'la, 2025). From the supply side, rice production was used because it reflects the availability of staple foods in a given region (Wajdah et al., 2024). Rainfall was selected because the agricultural sector is heavily influenced by climate stability and weather conditions, while government spending on the agricultural sector reflects policy support aimed at increasing agricultural productivity through the development of irrigation infrastructure, agricultural subsidies, and production-enhancement programs ('Alim et al., 2026). Food security in Indonesia is measured using the Food Security Index (FSI), which covers the aspects of food availability, affordability, and utilization (National Food Agency, 2022). The following are Indonesia's Food Security Index (FSI) values for 2020-2024, which illustrate the evolution of food security conditions nationwide.



Source: National Food Agency, 2025

Figure 1. Indonesia's Food Security Index, 2020-2024

Nationally, Indonesia's food security conditions showed an upward trend during the 2020-2024 period. However, this improvement is still accompanied by disparities across regions. Several provinces, such as Bali, Central Java, DKI Jakarta, West Sumatra, and the Special Region of Yogyakarta, have high FSI scores, while Papua, West Papua, North Maluku, Maluku, and the Riau Islands still have relatively low FSI scores. This can be seen in the following figure.



Source: Central Statistics Agency, 2025

Figure 2. Indonesia's Food Security Index (FSI) Score and the Five Provinces with the Highest and Lowest FSI Scores in 2024

This situation indicates that the success of national food production has not yet been fully accompanied by equitable access to and stability of food supplies across all regions of Indonesia. One province that plays a strategic role in national food security is Central Java, known as the nation's breadbasket, particularly for rice (National Food Agency, 2022). In 2024, Central Java contributed 8.89 million metric tons to national rice production and achieved a relatively high and stable IKP score. However, this situation does not yet fully reflect the equitable distribution of food security at the regency/city level.

The former Barlingmascakeb region comprising Banjarnegara, Purbalingga, Banyumas, Cilacap, and Kebumen exhibits varying IKP scores. Cilacap Regency has a relatively higher IKP score compared to Central Java Province's IKP, while Banyumas, Purbalingga, Banjarnegara, and Kebumen remain below the provincial IKP average. These conditions are illustrated in the following table.

Table 1. Food Security Index for Central Java Province and the Former Barlingmascakeb Region, 2020-2024

Wilayah	2020	2021	2022	2023	2024
Jawa Tengah	82,31	82,73	82,95	84,80	85,34
Cilacap	84,04	84,32	83,23	84,13	84,69
Banyumas	80,48	79,97	79,02	79,81	80,74
Purbalingga	80,15	79,33	79,25	78,05	78,47
Banjarnegara	78,45	78,99	78,61	80,28	79,40
Kebumen	80,41	78,56	79,29	80,34	81,21

Source: Central Statistics Agency, 2025

This is an interesting topic to examine because the former Barlingmascakeb region has relatively uniform geographical characteristics and is known to have a fairly strong agricultural sector (Central Statistics Agency, 2024). In theory, regions with high food production capacity should have a higher level of food security. However, empirical evidence shows that high agricultural potential has not been fully capable of improving food security evenly. This indicates that food security is influenced not only by food production but also by other factors such as household purchasing power, population pressure, food prices, climatic conditions, and local government policy support.

Various previous studies have shown that both demand- and supply-side factors influence food security, but the research findings remain inconsistent. Putri's (2023) study indicates that rice production has a significant impact on food security, whereas Putra's (2025) study suggests that production factors do not have a significant impact. Research by Anwar (2022) and Harvian & Yuhan

(2019) shows that government spending and climate factors have a significant impact on agricultural growth, which ultimately enhances food security in Indonesia. Furthermore, Prasetya's (2024) study indicates that population size does not significantly affect food security, whereas Putri & Suripto's (2024) study reveals a significant relationship between population size and food security. Research by Sadevi et al. (2020) indicates that increased income contributes to improved household food security, whereas research by Safuridar et al. (2024) reveals a negative relationship between income and household food security. These conflicting findings highlight a research gap regarding the determinants of food security, particularly at the district/city level. Therefore, this study aims to analyze the effects of the minimum wage (UMK), population size, rice prices, rice production, rainfall, and government spending on the agricultural sector on food security in the former Barlingmascakeb region from 2018 to 2024 both collectively and individually and to identify the variables that most significantly influence food security in that region. This study falls within the field of agricultural economics and focuses on analyzing food security at the district/city level using the Food Security Index (FSI) as the dependent variable, which represents the aspects of food availability, affordability, and utilization. The study uses secondary data sourced from the Central Statistics Agency, the National Food Agency, and other relevant agencies, employing panel data regression analysis.

The uniqueness of this study lies in its combined use of both demand-side and supply-side approaches to analyze food security at the district/city level in the former Barlingmascakeb region. This study not only emphasizes food production but also integrates socioeconomic factors, demographics, food prices, climatic conditions, and local government policy support into a single analytical model. Furthermore, this study uses the former Barlingmascakeb region as its research subject because, while the region has a strong agricultural base, it still exhibits disparities in food security across different areas. Thus, this study is expected to provide a more specific empirical picture of the determinants of food security at the regional level.

This study is expected to contribute to the development of the literature on development economics and agricultural economics, particularly regarding the analysis of the determinants of food security at the district/city level. It is also expected to enrich the study of food security through a multidimensional approach that integrates food supply and demand factors into a single analytical model. Furthermore, this study can serve as an academic reference for future research examining food security at the regional level. Practically, the research findings are expected to inform local governments in the former Barlingmascakeb region in formulating more targeted development policies to enhance regional food security. This study can also serve as a foundation for formulating policies related to increasing public purchasing power, controlling food prices, boosting agricultural production, strengthening agricultural infrastructure, and optimizing government spending in the agricultural sector to support the creation of inclusive and sustainable food security.

The research results are expected to show that the variables of the regional minimum wage (UMK), population size, rice prices, rice production, rainfall, and government spending on the agricultural sector have an impact on food security in the former Barlingmascakeb region, both collectively and individually. The variables of rice production, UMK, rainfall, and government spending on the agricultural sector are expected to have a positive impact on improving food security, while population growth and rising rice prices are expected to potentially reduce food security levels.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Food Security

Food security is a state in which all members of society have access to sufficient, safe, nutritious, and sustainable food to meet the needs of a healthy and productive life. The concept of food security refers to the definition put forward by the Food and Agriculture Organization, which states that food security exists when all people, at all times, have physical and economic access to

sufficient, safe, and nutritious food to meet their nutritional needs and lead active and healthy lives. The concept of food security is reaffirmed in Law of the Republic of Indonesia No. 18 of 2012 on Food, which states that food security is a condition in which food needs are met at all levels from the national to the individual as reflected in the sustainable availability of food that is sufficient, safe, nutritious, equitable, and affordable. Food security in this study was measured using the Food Security Index (FSI), which is based on three main dimensions: food availability, food accessibility, and food utilization (Food Security Agency, Ministry of Agriculture, 2019). The food availability dimension relates to a region's ability to provide food through domestic production, food reserves, and distribution. The food accessibility dimension relates to the economic and physical capacity of the population to obtain food, which is influenced by income levels, food price stability, and poverty rates. Meanwhile, the food utilization dimension relates to the quality of food consumption, nutritional status, health, and the public's access to basic services such as education and healthcare.

The Theory of Supply and Demand

The theory of supply and demand explains that the price and quantity of traded goods are determined by the interaction between consumer demand and producer supply. Demand is influenced by income levels, population size, and food prices, while supply is influenced by production capacity, technology, natural conditions, and government support. Population growth and rising food prices can increase pressure on public access to food, while increased food production and government support for the agricultural sector can strengthen food availability. Therefore, the balance between food supply and demand is a key factor in determining a region's food security (Siregar et al., 2023).

Regency/City Minimum Wage (UMK)

The Regency Minimum Wage (UMK) is the minimum wage standard set by local governments to protect workers and ensure they receive a decent income (Taipah et al., 2024). The relationship between income and consumption is explained in the consumption theory proposed by John Maynard Keynes, which states that an increase in income will boost public consumption. An increase in the UMK can enhance the public's purchasing power, thereby improving households' ability to meet their food needs. Furthermore, the concept of food security put forward by the FAO emphasizes that economic access to food is one of the key dimensions of food security. Research by Yohanes & Murwiati (2025) shows that the minimum wage has a positive effect on household food expenditure. Therefore, an increase in the Regency Minimum Wage (UMK) is expected to strengthen household access to food and improve regional food security.

H1: The Regency Minimum Wage (UMK) has a positive effect on food security in the former Barlingmascakeb region.

Population Size

Population size is one of the factors influencing food demand. Population growth is defined as changes in population size influenced by births, deaths, and migration (Panggabean et al., 2024). The theory proposed by Malthus (1798) explains that population growth tends to increase geometrically, while food production increases arithmetically. This imbalance can put pressure on food availability if population growth is not matched by an increase in food production. Population growth will increase demand for food, particularly staple foods such as rice, and thus has the potential to affect food stability if not balanced by adequate food production and distribution capacity. Research by Damayanti & Khoirudin (2016) indicates that family size has a negative correlation with food security. Consequently, population growth is expected to reduce regional food security levels.

H2: Population size has a negative impact on food security in the former Barlingmascakeb region.

Rice Prices

Price is the amount consumers must pay to obtain a good or service (Al-Asror et al., 2023). Alfred Marshall's theory of demand explains that there is a negative relationship between the price of a good and the quantity demanded. A rise in rice prices can reduce people's purchasing power for food, particularly for low-income households that allocate a large portion of their expenditures to food consumption. This situation can limit people's access to sufficient and nutritious food, thereby potentially lowering the region's level of food security (Angkak et al., 2024). Research by Prasetya (2024) indicates that the prices of strategic food commodities influence food security. Therefore, an increase in the price of rice is suspected to reduce the community's level of food security.

H3: The price of rice has a negative effect on food security in the former Barlingmascakeb region.

Rice Production

Rice production refers to the total amount of rice produced in a given region and serves as a key indicator in the agricultural sector, as rice is the primary staple food for the Indonesian people (Wahyu et al., 2025). Production theory explains that increases in output are influenced by a combination of production factors such as land, labor, capital, and technology (Kamaruddin et al., 2022). Increased rice production can expand domestic food availability, maintain the stability of the food supply, and reduce dependence on food imports. Therefore, rice production is closely linked to the dimension of food availability within the concept of food security. In the concept of food security proposed by the FAO (2025), food availability is one of the main dimensions of food security. Research by Nisa & Lubis (2025) shows that rice production has a positive effect on food security. Therefore, an increase in rice production is expected to enhance regional food security.

H4: Rice production has a positive effect on food security in the former Barlingmascakeb region.

Rainfall

Rainfall is the amount of rain that falls in a given area over a specific period, typically measured in millimeters (mm) (Mendrofa & Hulu, 2024). Justus Liebig's "law of the minimum" (1840) explains that plant growth is influenced by the most limiting factor of production, one of which is water. Adequate rainfall can increase agricultural productivity, thereby strengthening regional food availability (Nafisha & Suwarsito, 2018). Therefore, rainfall conditions play a crucial role in maintaining the stability of food production and supporting regional food security.

H5: Rainfall has a positive effect on food security in the former Barlingmascakeb region.

Government spending on the agricultural sector

Government spending on the agricultural sector refers to government expenditures allocated to support agricultural development through the provision of agricultural infrastructure, input subsidies, agricultural research, and farmer empowerment (Rangkuti et al., 2026). Increased government spending on the agricultural sector can boost agricultural productivity and strengthen food production capacity, thereby supporting the stability of food availability in a region (Rasmikayati, 2025). Such support also plays a role in improving the efficiency of food distribution and farmers' welfare, thereby strengthening the regional food system in a sustainable manner. Research by Ravel et al. (2025) shows that government policy support has a positive impact on the sustainability of the agricultural sector. Thus, increased government spending on the agricultural sector is expected to enhance regional food security.

H6: Government spending on the agricultural sector has a positive effect on food security in the former Barlingmascakeb region.

Various previous studies have shown that socioeconomic, demographic, agricultural production, and environmental factors are associated with food security. A study by Yohanes & Murwiati (2025) indicates that the minimum wage has a positive effect on household food expenditure. A study by Nisa & Lubis (2025) found that rice production has a positive and significant

effect on food security. Research by Usman et al. (2025) indicates that population size affects rice food security. Additionally, a study by Prasetya (2024) found that food prices affect food security. Other studies also show that government support for the agricultural sector, as well as climatic conditions such as rainfall, are linked to regional food security. Nevertheless, the results of previous studies still show inconsistencies, necessitating further research in different regions and time periods. This study differs from previous research in that it focuses specifically on the former Barlingmascakeb region, with a study period spanning 2018-2024. This study also combines demand- and supply-side variables into a single panel data analysis model, including the Regency Minimum Wage (UMK), population size, rice prices, rice production, government spending on the agricultural sector, and rainfall, all of which are examined in relation to food security. Thus, this study is expected to provide an empirical contribution toward a more comprehensive explanation of the determinants of food security at the regional level.

RESEARCH METHODS

This study employs a quantitative method with an associative approach. A quantitative method is a research method used to test hypotheses through the analysis of numerical data, while an associative approach aims to identify the relationship or influence between two or more variables (Sugiyono, 2023). This study is designed to analyze the influence of demand-side and supply-side factors on food security in the former Barlingmascakeb region using panel data regression analysis. The study covers five regencies in the former Barlingmascakeb region, namely Cilacap, Banyumas, Purbalingga, Banjarnegara, and Kebumen, with a study period spanning 2018-2024. The study uses secondary data in the form of the Food Security Index (IKP), Regency/City Minimum Wage (UMK), population, rice prices, rice production, rainfall, and government spending on the agricultural sector. The data were obtained from the National Food Agency, the Central Statistics Agency (BPS), the Commodity Price and Production Information System (SIHATI), and other relevant agencies.

Data collection was conducted using the documentation method by gathering secondary data published by official government agencies. Data were obtained from statistical reports, official publications, and relevant, reliable online sources. The dependent variable in this study is food security, measured using the Food Security Index (IKP). The independent variables include the Regency/City Minimum Wage (UMK), population, rice prices, rice production, rainfall, and government spending on the agricultural sector. Each variable is measured using specific operational units, such as rupiah, people, metric tons, and millimeters per year, depending on the data sources used. The data analysis technique used is panel data regression because the study combines time-series and cross-sectional data. The panel data regression model in this study is formulated as follows:

$$IKP_{it} = \alpha + \beta_1 UMK_{it} + \beta_2 JP_{it} + \beta_3 HB_{it} + \beta_4 PB_{it} + \beta_5 CH_{it} + \beta_6 BP_{it} + \varepsilon_{it}$$

Notes:

- IKP = Food Security Index
- UMK = Regency/Municipal Minimum Wage
- JP = Population
- HB = Rice Price
- PB = Rice Production
- CH = Rainfall
- BP = Government Expenditure on the Agricultural Sector
- i = Former Barlingmascakeb Regencies
- t = Years 2018-2024
- ε = Error Term

The panel data estimation methods used include the Common Effects Model (CEM), the Fixed Effects Model (FEM), and the Random Effects Model (REM) (Gujarati & Porter, 2009). The selection of the best model was conducted using the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test. Additionally, classical assumption tests were performed, including tests for normality, multicollinearity, and heteroscedasticity. An autocorrelation test was not conducted because the study utilized panel data, making such a test deemed less relevant (Basuki, 2021). Model fit was assessed using the coefficient of determination (Adjusted R^2) to evaluate the ability of the independent variables to explain the dependent variable. Furthermore, hypothesis testing was conducted using the F-test to determine the simultaneous effect of the independent variables on food security and the t-test to determine the partial effect of each independent variable on food security at a 5% significance level.

RESULTS AND DISCUSSION

RESULT

a. Selection of the Best Model

1) Chow test

Tabel 2. Results of the Chow test

Effect Test	Prob
Cross-section F	0.0721
Cross-section Chi-square	0.0170

Source: Eviews, 2026

Based on Table 2, the cross-section F probability value is 0.0721, which is greater than 0.05. These results indicate that the Common Effect Model (CEM) is the most appropriate model to use in this study.

2) Lagrange Multiplier Test

Table 3. Results of the Lagrange Multiplier Test

Description	Description
Cross-section Breusch Pagan	0.1947

Source: Eviews, 2026

Based on Table 3, the probability value for the Cross-section Breusch-Pagan test is 0.1947, which is greater than 0.05. These results indicate that the Common Effect Model (CEM) is the more appropriate model to use in this study. Consequently, the panel data analysis in this study employs the Common Effect Model approach, as this model is deemed capable of explaining the relationships among the variables in the study without accounting for the specific characteristics of each regency in the former Barlingmascakeb region.

b. Classical assumption tests

1) Normality test

Table 3. Normality test

Jarque-Bera	Probability
1.445051	0.485524

Source: Eviews, 2026

Based on Figure 3, the Jarque-Bera value is 1.445051 with a probability value of 0.485524. This probability value is greater than 0.05, indicating that the residual data in the regression model are normally distributed.

2) **Multicollinearity test****Table 4. Multicollinearity test**

Variabel	Coefficient Variance	Uncentered VIF	Centered VIF
C	4.469152	111.7477	NA
UMK	2.71E-12	259.8042	3.571678
JP	7.60E-07	40.24552	2.892273
HB	5.16E-08	140.2141	2.340619
PB	1.16E-11	16.09779	5.068653
CH	2.10E-08	4.870619	1.178170
BP	1.79E-22	5.397114	2.115498

Source: Eviews, 2026

Based on the results of the multicollinearity test, all independent variables have a Centered VIF value < 10. This value indicates that there is no high correlation between the independent variables. Thus, it can be concluded that the regression model in this study is free from multicollinearity issues.

3) **Heteroscedasticity Test****Table 5. Heteroscedasticity Test**

Variabel	Coefficient	Std. Error	t-Statistic	Prob.
C	2.057295	1.070150	1.922437	0.0648
UMK	-0.000292	0.000834	-0.349808	0.7291
JP	0.000201	0.000441	0.455215	0.6525
HB	-4.36E-05	0.000115	-0.378988	0.7076
PB	-5.67E-05	0.000172	-0.329137	0.7445
CH	-0.000111	7.34E-05	-1.517443	0.1404
BP	-845E-06	6.77E-05	-0.124879	0.9015

Source: Eviews, 2026

Based on the results of the heteroscedasticity test, all independent variables have probability values greater than 0.05. Thus, it can be concluded that the regression model in this study does not suffer from heteroscedasticity and is therefore suitable for further analysis.

c. **Goodness of Fit Test (*Goodness of Fit*)**

Based on the results of selecting the best model using the Chow test, a Cross-section F probability value of 0.0721 was obtained, which is greater than the significance level of 0.05. Therefore, the model selected in this study is the Common Effect Model (CEM). The following are the results of the panel data regression estimation using the Common Effect Model (CEM).

Tabel 6. Uji Statistik

Variabel	Koefisien	t-Statistik	Prob.
C	59.96648	28.36622	0.0000
UMK	0.014496	8.800973	0.0000
JP	0.000308	0.353276	0.7265
HB	-0.000940	-4.139430	0.0003
PB	-0.000359	-1.054201	0.3008
CH	0.000333	2.297513	0.0293
BP	0.000134	1.004292	0.3238
R-squared	0.866191		
F-statistic	30.20889		
Prob(F-statistic)	0.000000		

Source: Eviews, 2026

1) Coefficient of determination (R^2)

Based on the data analysis results, the R-squared value was 0.866191, or 86.62%. This indicates that the independent variables account for 86.62% of the variation in the dependent variable. The remaining 13.38% is explained by other variables outside the research model that were not included in this study. A high coefficient of determination indicates that the research model has a strong ability to explain the variation in the dependent variable.

2) Hypothesis testing**a) F-test**

The F-statistic value is 30.20889 and the F-table value is 2.45. These results indicate that the F-statistic value is greater than the F-table value, $30.20889 > 2.45$. Additionally, the probability value of the F-statistic is $0.000000 < 0.05$. Thus, H_0 is rejected and H_1 is accepted, so it can be concluded that the variables of the Regency Minimum Wage (UMK), Population, Rice Price, Rice Production, Rainfall, and Government Expenditure on the Agricultural Sector collectively have a significant effect on the Food Security Index in the former Barlingmascakeb region for the years 2018–2024.

b) t-Test**1. Regency Minimum Wage (UMK)**

The t-statistic value of $8.800973 > 1.701$ and the probability value of $0.0000 < 0.05$. Thus, the UMK variable has a positive and significant effect on the Food Security Index in the former Barlingmascakeb region. This means that every 1 percent increase in the UMK will increase the Food Security Index by 0.014496.

2. Population Size

The t-statistic value of 0.353276 is greater than or equal to -1.701, and the probability value of 0.7265 is greater than 0.05. Thus, the Population variable does not have a significant negative effect on the Food Security Index in the former Barlingmascakeb region.

3. Rice Price

The t-statistic value of $-4.139430 < -1.701$ and the probability value of $0.0003 < 0.05$. Thus, the Rice Price variable has a negative and significant effect on the Food Security Index in the former Barlingmascakeb region. This means that every 1 percent increase in the price of rice will reduce the Food Security Index by 0.000940.

4. Rice Production

The t-statistic value of -1.054201 is less than or equal to 1.701, and the probability value of 0.3008 is greater than 0.05. Thus, the Rice Production variable does not have a significant positive effect on the Food Security Index in the former Barlingmascakeb region.

5. Rainfall

The t-statistic value of 2.297513 is greater than 1.701, and the probability value of 0.0293 is less than 0.05. Thus, the Rainfall variable has a positive and significant effect on the Food Security Index in the former Barlingmascakeb region. This means that a 1 percent increase in rainfall will increase the Food Security Index by 0.000333.

6. Government Expenditure on the Agricultural Sector

The t-statistic value is $1.004292 < 1.701$ and the probability value is $0.3238 > 0.05$. Thus, the Government Expenditure on the Agricultural Sector variable does not have a significant positive effect on the Food Security Index in the former Barlingmascakeb region.

Discussion

The Effect of the Regency/Municipal Minimum Wage (UMK) on Food Security

The research results indicate that the regional minimum wage (UMK) has a positive and significant effect on food security in the former Barlingmascakeb region from 2018 to 2024. This suggests that an increase in community income enhances households' ability to meet their food needs (Inayaturohmah et al., 2023). The higher the level of community income, the greater the community's purchasing power for food, thereby enabling them to obtain sufficient, safe, and nutritious food (Praza & Shamadiyah, 2020). These findings indicate that economic access plays a crucial role in achieving food security. Increased income enables communities to better maintain the stability of their food consumption even in the face of rising food prices. Furthermore, higher income also enables communities to access higher-quality food, thereby supporting improved regional food security. These research findings align with Keynes's (1936) consumption theory, which states that an increase in income boosts consumption. Additionally, Alfred Marshall's (1890) theory of demand explains that income levels influence the demand for goods and services, including food. The findings of this study also support the research by Sadevi et al. (2020) and Hidayati (2023), which states that an increase in household income has a positive effect on food security because it increases people's purchasing power for food.

The Effect of Population Size on Food Security

The results indicate that population size does not have a significant effect on food security in the former Barlingmascakeb region. This suggests that population growth did not directly influence changes in food security conditions during the study period. Malthus's theory (1798) posits that population growth outpacing food production growth can put pressure on food availability. However, the results of this study indicate that such a situation has not yet occurred in the study area. Advances in agricultural technology, interregional food distribution, and community economic activities have ensured that people's food needs remain met despite the ongoing increase in population (Lantarsih et al., 2016). Research by Arizka et al. (2021) indicates that the utilization of agricultural tools and machinery through the Agricultural Tools and Machinery Service Business (UPJA) in Banyumas, Purbalingga, and Banjarnegara Regencies has been successful and has supported improved performance in rice farming operations. In addition, developments in transportation and food trade systems have meant that communities no longer rely solely on local food production. The movement of food between regions ensures that food needs are met, so that population growth does not directly undermine food security. The findings of this study are consistent with research by Putra (2025), which shows that population size does not always have a significant impact on food security as long as food distribution and economic access for communities function effectively.

The Impact of Rice Prices on Food Security

The research findings indicate that rice prices have a negative and significant impact on food security in the former Barlingmascakeb region. This suggests that rising rice prices will reduce the community's level of food security, as rice is the primary staple food for the population. Rising rice prices lead to a decline in purchasing power, particularly among low-income groups (Tamba, 2026). When rice prices rise, a large portion of household income is spent on meeting basic food needs, thereby reducing the community's ability to meet other nutritional food requirements. This situation can affect the quality of the community's food consumption and reduce household food security. These research findings align with Alfred Marshall's (1890) theory of supply and demand, which states that price affects the level of demand for a good. Furthermore, the FAO's concept of food security also emphasizes that economic access to food is one of the key dimensions in achieving food security. This study is consistent with the research by Ramadhan & Faridatussalam

(2024), which shows that rising food prices particularly for rice have a negative impact on community food security.

The Impact of Rice Production on Food Security

The research results indicate that rice production does not have a significant effect on food security in the former Barlingmascakeb region. This finding suggests that an increase in rice production does not necessarily directly improve community food security. Within the FAO's concept of food security, food availability is indeed one of the main pillars of food security. However, food security is not only influenced by production aspects but also by food distribution, the community's economic access, and food price stability (Salma et al., 2026). Therefore, high rice production does not always reflect a high level of food security if the community still faces limited access to food. Developments in food distribution systems and interregional trade have meant that communities no longer rely solely on local production. Furthermore, changes in consumption patterns have meant that food security no longer relies solely on rice consumption. This finding is supported by a study by Azyan et al. (2023), which found that provinces with high rice production do not necessarily have high levels of food security. Thus, the success of improving food security does not depend solely on increasing rice production but also requires improving access to food, increasing people's purchasing power, and strengthening the food distribution system. The results of this study are consistent with the research by Hidayat et al. (2025), which states that food security is more influenced by food accessibility than by food production alone.

The Effect of Rainfall on Food Security

The study's findings indicate that rainfall has a positive and significant effect on food security in the former Barlingmascakeb region. This suggests that adequate rainfall can support agricultural activities and increase food availability for the community. The former Barlingmascakeb region remains dominated by the agricultural sector, making climatic conditions a critical factor in supporting agricultural productivity. Optimal rainfall can increase agricultural yields because it adequately meets the water needs of crops (Muhardiono et al., 2024). Conversely, low or erratic rainfall can disrupt agricultural productivity, thereby affecting community food security. The results of this study indicate that climatic factors continue to play a significant role in food security in agricultural regions. This study is consistent with the research by Sulaminingsih et al. (2024), which shows that rainfall has a positive effect on food production and regional food security.

The Impact of Government Spending in the Agricultural Sector on Food Security

The results indicate that government spending in the agricultural sector did not have a significant effect on food security in the former Barlingmascakeb region from 2018 to 2024. This suggests that increased government funding for the agricultural sector has not yet been able to directly improve community food security. Theoretically, government spending is part of fiscal policy used to support economic development and increase agricultural sector productivity (Azwar, 2016). However, the impact of government spending in the agricultural sector tends to take a relatively long time to materialize, so its effect on food security cannot be felt directly in the short term (Rahmatika et al., 2024). Furthermore, the lack of significant government spending in the agricultural sector indicates that food security is influenced not only by the size of the budget but also by the effectiveness of program implementation. The targeting of programs, the distribution of aid, the development of agricultural infrastructure, and capacity building for farmers are key factors in determining the success of agricultural policies regarding food security. During the study period, shifts in government policy during the COVID-19 pandemic also led to the reallocation of part of the budget, resulting in some agricultural programs not operating optimally (Suryana et al., 2020). On the other hand, community food security could still be maintained through other factors such as increased community income, interregional food distribution, social food assistance, and food price stabilization. The results of this study are consistent with the research by Auwalina &

Wasil (2026), which showed that government spending in the agricultural sector does not always have a significant impact on food security.

CONCLUSION

a. Conclusion

Based on the results of a study on the effects of the Regency/Municipal Minimum Wage (UMK), population size, rice prices, rice production, rainfall, and government spending on the agricultural sector on food security in the former Barlingmascakeb region from 2018 to 2024- using a panel data regression method with the Common Effect Model (CEM) approach it can be concluded that the UMK and rainfall variables have a positive and significant effect on food security, while rice prices have a negative and significant effect on food security. Meanwhile, population size, rice production, and government spending on the agricultural sector did not have a significant effect on food security in the former Barlingmascakeb region. The results also indicate that, collectively, all independent variables have a significant effect on the Food Security Index, with a Prob(F-statistic) value of $0.000000 < 0.05$. Furthermore, the coefficient of determination (R-squared) of 0.866191 indicates that 86.62 percent of the variation in food security can be explained by the variables in the study, while the remaining 13.38 percent is explained by other variables outside the research model.

b. Implications

The results of this study indicate that improving community welfare is a key factor in strengthening food security. Therefore, local governments need to promote increased community income through job creation, strengthening the productive economic sector, and improving the quality of the workforce so that communities are better equipped to meet their food needs. In addition, local governments need to maintain food price stability particularly rice prices by strengthening food distribution, monitoring food stocks, and implementing market stabilization measures when prices rise sharply. Food price stability is crucial because rising rice prices have been shown to undermine community food security. The government also needs to strengthen efforts to mitigate and adapt to climate change through the development of irrigation infrastructure, water resource management, and the adoption of agricultural technologies adapted to weather conditions in order to maintain food production stability.

c. Limitations of the study

This study still has several limitations that can serve as points for evaluation in future research. The first limitation lies in data availability, particularly for the most recent year. Complete data for some variables in 2025 are not yet available for all districts in the former Barlingmascakeb region; therefore, the study only covers the 2018-2024 period. Furthermore, government spending data for the agricultural sector obtained from each local government lacks consistency in naming and budget classification, which limits the data collection and adjustment process.

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