



Local Food Resources, Food Security, and Regional Economic Outcomes: A North Sulawesi Empirical Model

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Abstract

This research aims to analyze the influence of local food resources on food security and its impact on the local economy. The background of the research departs from the condition of North Sulawesi Province which has unique geographical characteristics with abundant natural resources, agriculture, and fisheries. Nevertheless, this region still faces challenges in the form of dependence on food supply from outside, fluctuations in commodity prices, and suboptimal economic diversification based on local potential. The research method used is to use a quantitative approach with path analysis using SEM-PLS. Primary data was obtained from 82 respondents involved in local food management and utilization. The results of the study show that food security has a direct and significant effect on the local economy. Local food resources have also been shown to have a direct and significant effect on food security, but do not have a direct effect on the local economy. In addition, there is a significant indirect influence of local food resources through food security on the local economy. This research is expected to contribute to the government as a policymaker in encouraging food security based on local potential to improve the local economy, especially in North Sulawesi Province.

Keywords: Local Food Resources, Food Security, Local Economy, Regional Potential, Policy

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INTRODUCTION

Food security is one of the strategic issues in national development, which is listed in the National Medium-Term Development Plan

(RPJMN) 2025-2029, in line with this and is also in line with the Sustainable Development Goals (SDGS) in the second point, namely Zero Hunger (Kementerian Desa Dan Pembangunan

Daerah Tertinggal, 2025). Food security is a condition where food is fulfilled in terms of availability, affordability, quality and safety as well as sustainability (Partini & Sari, 2022). So that countries with high food security will be resilient to shocks such as crises, pandemics, natural disasters, and others.

However, based on data from the National Food Agency in 2018-2020, Indonesia's strategic food has not all been fulfilled by domestic production such as soybeans (80-90% imports), sugar (65-70% imports), garlic (90-95% imports) and beef (25-30% imports) when world food production is disrupted, of course it will have an impact on the condition of national food, as well as unmet needs. price stability, inflation and will have an impact on the national economy (PERTANIAN et al., 2020).

For this reason, in various countries, including Indonesia, food security is included in the government's priority agenda in its development by encouraging domestic food production based on local resources such as crop diversification and the use of technology in agriculture and fisheries, in order to strengthen independent food capabilities (biwilfa nuryetri, 2025).

In strengthening and increasing food security, Indonesia as the most dominant commodity agricultural country is agriculture, so agriculture is one of the sectors that can produce food resources (Aninda & Rijanta, 2017).

Local food resources require technological innovation and creativity, so that local food resources can play a role in strengthening food security. Food resources are things that can help the community in meeting their primary needs (Azzahra & Irawansyah, 2025; N et al., 2025). In addition, local food resources play a crucial role in driving and strengthening the local economy

through various aspects. This includes increasing farmers' incomes, creating jobs, strengthening local businesses and economic independence as well as improving welfare and sustainable development (Anggoro, 2025; Di et al., 2025; Sihite et al., 2025).

Improving the local economy through the use of local food resources will create a large economic impact in a sales area where farmers have a shorter supply chain so that farmers can get higher prices because commodities are sold directly to end consumers in one region (Fizzanty & Kusnandar, 2012).

In addition, it will have an impact on the creation of new jobs. The increase in demand for local food will trigger the growth of related businesses so that it can support jobs in various sectors such as agriculture, processing, distribution, and retail (Gómez & Lee, 2023).

This also has an impact on strengthening local businesses and local independence, by utilizing local resources, a region can reduce dependence on external supplies so that the economic turnover in a region will increase and aspects of food security can be fulfilled this will make the quality of life of the community increase and support the local economy (Dari et al., 2014).

North Sulawesi is an area with unique geographical characteristics, with abundant potential for coastal natural resources, agriculture and fisheries. However, on the other hand, there are still challenges in the form of dependence on food supply from outside the region, fluctuations in commodity prices, and not yet optimal economic diversification based on local potential. This phenomenon shows that the strength of local food resources has not been fully utilized to strengthen food security and encourage sustainable local economic growth.

In this context, local food resources are understood as the utilization of physical assets (nature, land, sea, agriculture, fisheries, etc.) (Rauf & Lestari, 2009; Timikasari et al., 2022). Meanwhile, food security is the availability of sufficient local food, local food consumption, and reducing the consumption of imported products (Purwaningsih, 2008). The local economy is an increase in job opportunities, strengthening local businesses and economic independence (Etika Ari Susanti, Imam Hanafi, 2004).

The effective use of local food resources will create a regional food value chain, strengthen the household economy, and improve the welfare of the community (Liu et al., 2023). Therefore, it is necessary to conduct an analysis related to the influence of local food resources on food security? How does food security affect the local economy? And how does the influence of local food resources through food security affect the local economy? In North Sulawesi.

This study aims to provide a more comprehensive understanding of the role of local food resources in food security and its implications for the local economy in North Sulawesi. This research is expected to make a practical and scientific contribution to policy formulation related to the government's priority program, namely food security. And the development of local resources, for the local economy in North Sulawesi Province.

RESEARCH METHODS

The research method used uses a quantitative approach with the path analysis/path analysis method (Parasan & Manoppo, 2022) to analyze the influence of local food resources on food security and its

implications on the local economy in North Sulawesi, conceptually this study hypothesizes that local food resources have an effect on food security, food security affects the local economy, food security has a direct impact on the local economy, local food resources through food security affect the local economy.

The relationship of each existing variable illustrates that the availability, accessibility, and optimal utilization of local food sources is believed to be able to increase local food security, and good food security can encourage economic stability, increase community income, and strengthen local economic activities. Thus, Food Security (Z) can play a role as a mediating variable in the relationship between local food resources (X) and Local Economy (Y). From this, it can be answered to the extent to which food security mediates local food resources to the local economy in the north.

This study uses Local Food Resources (X) as an exogenous latent variable that describes the potential of the utilization of local food resources originating from the local area. The variables are measured from several indicators such as: the availability of local food, which reflects the amount and diversity of local food, the availability of local food, which shows the ease of the community in obtaining local food, the use of local food, which describes the level of consumption and processing of local food by the community and local food products can be a source of income for the community.

Food Security (Z) is a mediating variable that describes the ability of households or communities to meet food needs in a sustainable manner. Indicators in this variable are: food availability, food access, food utilization, food stability. This reflects food security in accordance with the framework of the FAO food

and agriculture organization. Local Economics (Y) is an endogenous latent variable that reflects the economic conditions and performance of the community at the local level. Indicators in this variable: community income, employment opportunities, economic activities based on local potential, community welfare.

Local Food Resources (X) play a role as an independent variable (exogenous), Food Security (Z) plays a role as an intervening variable that bridges the influence of local food resources on the local economy and Local Economics (Y) plays a role as a dependent (endogenous) variable.

The type of data used is primary data, data collection techniques through filling out a structured questionnaire and measuring using a 5-Point likert skla with a score of 1 strongly disagree to 5 Strongly Agree, Data is sourced from communities in the North Sulawesi region with predetermined criteria. The criteria that have been set are business actors and local communities involved in the management and utilization of local food resources in local food production and consumption activities.

The sample was determined using the purposive sampling technique and in determining the number of samples because the coverage area is so wide using the lemeshow method (Yanto & Ammaru, 2024), in its implementation the total data from respondents who were successfully analyzed was 82 Respondents The data collection period in 2025 in the North Sulawesi region was 82 Respondents.

For the analysis technique used in this study, the SEM-PLS (Structural Equation Modeling – Partial Least Squares) model was used with a structured approach to analyze the direct and indirect relationships between

constructs (Sarstedt et al., 2021). To test the feasibility of the validity and reliability test research using an outer model with a Convergent Validity Loading Factor > 0.7 , a discriminant validity AVE value of > 0.5 with fornell-larcker criteria, and a Composite Reliability (CR) and Cronbach's alpha (CA) > 0.7 .

To see the relationship between latent constructs using the Inner Model evaluation by looking at R-Square (R^2) which shows the strength of the model's prediction on the dependent variable. And testing (Bootstrapping) by looking at path coefficients and T-Statistic to test existing hypotheses. Hypothesis tests were carried out at a significance rate of 5% ($p<0.05$).

RESULTS AND DISCUSSION

The Outer Model is tested to ensure that each indicator used in this research model is valid and reliable in representing latent costs (Marliana, 2019). The result of the Outer Model Test is shown in table 1.

Table 1. Outer Model Testing

Con- struct	Item	Loading Factor	AVE	CR	CA
Local	X ₁	0.850	0.715	0.902	0.900
Food	X ₂	0.851			
Resour- ces	X ₃	0.817			
	X ₄	0.905			
	X ₅	0.802			
Food	Z ₁	0.934	0.862	0.960	0.960
Security	Z ₂	0.921			
	Z ₃	0.917			
	Z ₄	0.810			
Local	Y ₁	0.943	0.804	0.929	0.918
Econo- my	Y ₂	0.904			
	Y ₃	0.918			
	Y ₄	0.940			
	Y ₅	0.937			

Source: Data processed, 2025

In table 1. The results of data processing showed that the outer loadings test, for convergent validity with the result that the entire loading factor value for each indicator was above 0.7 so that it can be concluded that all indicators have a strong correlation with the construct. When the loading factor value is above 0.7, it shows that the indicator has a large contribution in explaining latent variables (Sarstedt et al., 2021).

Then for the AVE (Average Variance Extracted) value, all components have a value above 0.5. This means that the variance of the indicators can be explained by the construct in question, so that the construct in this model is able to explain the indicators well, thus meeting the criteria of Convergent Validity.

Furthermore, table 1 shows the results of the construct reliability test with a Conbach's Alpha (CA) value above 0.7, and a Composite Reliability (CR) above 0.7 for the entire construct. These results show that each construct has a good and reliable level of internal consistency (Sarstedt et al., 2021). When the values of CA and CR are above 0.7, it shows that the indicators used have high reliability in measuring latent constructs (Sarstedt et al., 2021).

Table 2 shows the results of the Discriminant Validity (Cross Loading) test, the value in bold shows that each indicator has the highest loading factor in its own construct. This indicates that the validity of the discriminator is met, and that each construct has a differentiator from each other and that there is no overlap between the constructs (Sarstedt et al., 2021).

From the results of the Outer Model test in table 2, it can be concluded that the convergent validity, delivery validity, and reliability of the construct have met the requirements of validity

and reliability, so that the data is feasible to be used in the analysis of the next structural model.

Table 2. Discriminating Validity Test

Construct	Indicator	Z	Y	X
X	X4	0.874	0.798	0.905
	X1	0.798	0.737	0.850
Y	Y1	0.923	0.934	0.868
	Y3	0.870	0.917	0.838
Z	Z1	0.943	0.890	0.884
	Z4	0.940	0.870	0.877

Source: Data processed, 2025

The Inner Model is used to test existing hypotheses and the direction of influence between variables. Figure 1 shows the bootstrapping procedure in PLS-SEM to test the hypothesis.

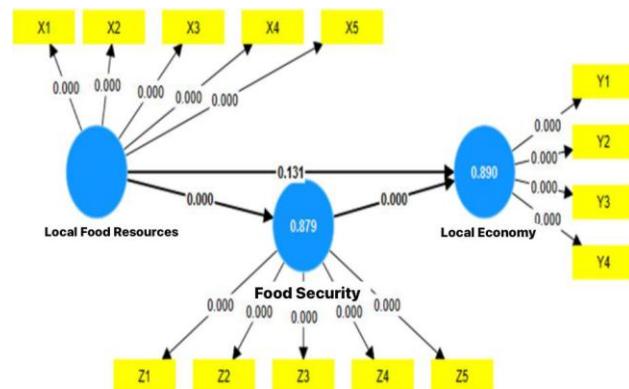


Figure 1. Test Results

Source: Data processed, 2025

The results of the test shown in Figure 1 and Table 3 contain the findings that the direct influence of food security on the local economy is statistically and significantly affected with a significance value ($p<0.00$), the direct influence of Local Food Resources on food security is proven to have a statistically significant effect with a value ($p<0.00$), while the direct influence of Local Food Resources on the local economy

was found to have no statistical effect with a value of ($p<0.131$), then the indirect relationship between Local Food Resources through food

security to the local economy was statistically significant with a value of ($p<0.000$).

Table 3. Test Results

	Original Sample	Sample mean (M)	Standard deviations (STDEV)	T- Statistics	P- Value
Food Security – Local Economy	0.727	0.716	0.146	4.989	0.000
Local Food Empowerment – Food Security	0.938	0.086	0.017	55.856	0.000
Local Food Resources – Local Economy	0.227	0.378	0.151	1.509	0.131
Local Food Resources – Food Security -Local Economy	0.682	0.672	0.137	4.990	0.000

Source: Data processed, 2025

The results of the tests shown in Table 3 can answer 4 hypotheses proposed in this study. Hypothesis 1, H_1 is accepted, and H_0 is rejected. That is, there is a direct and statistically significant influence between Food Security on the Local Economy (t-statistic 4.989, p-value 0.000).

Hypothesis 2, H_1 is accepted and H_0 is rejected. That is, there is a direct and statistically significant influence between Local Food Resources on Food Security (t-statistic 55.856, p-value 0.000). Hypothesis 3, H_1 is rejected, and H_0 is accepted. That is, there is no direct and statistically significant influence of Local Food Resources on the Local Economy (t-statistic 1.509, p-value 0.131).

Hypothesis 4, H_1 is accepted, and H_0 is rejected. That is, there is a statistically significant indirect influence between Local Food Resources through Food Security on the Local Economy (t-statistic 4.990, p-value 0.000). Based on the results of analysis and data processing using SEM-PLS, it was found that the

higher the level of food security in the region, the better the economic condition of the local community in that area.

Where the availability of stable food will help the community create a conducive economic environment because of the availability of basic needs that are met. North Sulawesi's food security data in 2024 has increased, especially in rice food production which is 265.30 thousand tons (GKG) and produces rice as much as 149.08 thousand tons.

The results of these findings are in line with research from (Novitasari, 2024) that food security affects economic growth in East Java Province, and research from (Biwilfa Nuryetri, 2025) that strong food security can have a positive impact on the economy and national defense, namely encouraging local economic independence, job creation, price and food supply stability, and the development of the food processing industry.

The findings of this study also support the North Sulawesi Province Medium-Term

Development Plan (RPJMD) for 2021-2026 that the achievement of food security is part of efforts to strengthen the local economy, where the agricultural sector in this region plays a role as the backbone of the economy.

Local Food Resources have a direct impact on food security. This proves that the improvement and utilization of effective and optimal local food resources will increase household and regional food security, where areas with good enough local food resources in terms of agriculture, fisheries, and others are able to maintain food availability, so that the level of food security in a blood increases data from the national food agency.

Regarding the food security index (IKP) shows that the highest score is in the district of northern Minahasa, North Sulawesi with a score of 83.69. The findings are in line with various studies that affirm that strengthening local food resources is a key strategy in increasing regional food security (Naif & Sholihah, 2025; Nurman & Meirina, 2024).

The findings of this study are also substantially in line with the mandate of the National Food Agency (BAPANAS) in realizing sovereign and independent national food security. These findings also support the strategy designed by the North Sulawesi regional government as contained in the RPJMD to ensure food independence and security at the local level through food diversification, food independence and sovereignty, price and supply stability, and maintaining resilience to crises. Where the optimization of local food resources is a fundamental pillar to achieve sustainable and resilient food security in the province of North Sulawesi.

Local Food Resources do not have a direct effect on the local economy. This is because the

use of local food resources is still not optimal so that it has not been able to improve the local economy directly, the availability of local food resources does not automatically increase the income of the community because local food resources have not been processed into valuable products, nor the production capacity of the people who manage local food resources is still not optimal.

According to The Future of Food and Agriculture (FAO) (Nations, 2025), local food resources only have an economic impact if processed through an effective market system and value chain. While the results of the research (Aninda & Rijanta, 2017) found the same thing, local food resources do not play much role in meeting household food needs because people do not consume local food every day.

According to the results of research from (Aninda & Rijanta, 2017; Sutrisno & Dewi, 2023) local food contribution to the new economy emerges when there is product diversification and adequate market access.

This finding provides an overview that if local food resources are not for the local economy, if there is no management in it, the availability of local food resources that are left alone will not have an impact on the local economy because it does not have added value, for this reason the government through the strategy of utilizing local food resources encourages business diversification in order to be able to contribute more to the local economy.

Local Food Resources through food security affect the local economy. Significant indirect influence on food security indicates that food security plays an intervening variable that bridges the relationship between the use of local food resources and the local economy. This is

because the use of local food resources, both from the agriculture, fisheries, etc. sectors, is able to strengthen food availability, reduce dependence on external supply, and stabilize household consumption.

When food security increases, the income of local economic activity also increases. According to the results of research from (Gifary et al., 2022; Research & Firmansyah, 2023) diversified local food resources are able to have a significant impact on food security and the local economy, the development of local sorghum through sorghum bread innovation shows how food diversification can create new economic value, both in the form of profits for the national economy and business opportunities for the community.

The food diversification movement is carried out through increasing productivity according to regional potential and increasing local food accessibility, including assistance to local food MSMEs. Thus, the diversification of local food resources plays an important role in strengthening food security which then encourages local economic growth.

This finding is in line with the national and regional priority agendas in the RPJMN (National Medium Term Government Plan) and RPJMD (Regional Medium Term Government Plan), a policy strategy that prioritizes local food can encourage investment in processing, marketing of food products, to create new jobs and increase local income.

In addition to strong food security will reduce dependence on raw products, where this will help maintain the purchasing power of the community and avoid inflation due to the purchasing power of the is maintained, so that strategic planning in the RPJM and RPJPD encourages the integration of local food

resources that has an impact on food security and the local economy. and is also related to the strategic objectives and policies of the Ministry of Agriculture which emphasize strengthening local food resources as the basis for food security and driving the local economy.

CONCLUSION

Food security has a significant direct influence on the local economy, as well as local food resources have a significant direct effect on food security, but local food resources do not have a statistically significant direct influence on the local economy.

This is attributed to the lack of optimal and effective management of local food resources, then the availability of local food is not directly increase income from the community if it is not managed into a valuable product so that it does not contribute directly to the economy.

Local food resources through food security provide a statistically significant indirect influence on the local economy, local food resources have a strategic role in strengthening food security in an area if utilized and diversified optimally making food availability more stable, strong food security creates an impact on the local economy.

In addition to maintaining availability, can encourage production activities, strengthen business opportunities and increase the income of the community and MSMEs. Theoretically, this research contributes to and strengthens the understanding of the relationship between local food resources, regional economies, and mediating food security, thereby enriching the literature on local economic development and food security. Based on the findings of this study, the Government of North Sulawesi is

expected to continue to encourage the community to strengthen food security based on local food resources in order to create a chain impact on the local economy of the region that leads to inclusivity, and is sustainable based on existing regional potential.

The agriculture office and the food security agency of North Sulawesi Province are expected to prioritize local food intensification and diversification programs, especially regional superior commodities such as corn and tubers, in food-insecure areas. Policies related to increasing productivity in increasing food production are expected to increase in the coming years in line with the policy direction of the RPJMN related to strengthening food security and the RPJMD of North Sulawesi Province in the development of a local resource-based economy.

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