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HOUSEHOLDS' FOOD SECURITY MODEL OF RICE FARMERS ON TIDAL LANDS OF BANJAR DISTRICT, INDONESIA

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ABSTRACT
The Banjar Regency is an area that has the second largest expanse of tidal rice fields in South Kalimantan Province which produces local rice with a characteristic productivity that is relatively low compared to superior rice. This condition leads to the assumption of insufficient food availability to support food security at the level of farming households in Banjar Regency. The purpose of this study is to analyze the level of food security, as well as the influence of farmer capacity, food availability and access, as well as food consumption on the household food security of tidal rice farmers in Banjar Regency. The sampling method used was *purposive sampling* of four villages, namely Bunipah and Simpang Warga villages in the Aluh-aluh district, as well as Keliling Benteng Ilir and Tajau Landung villages in the Sungai Tabuk district, with a total of 60 households of tidal rice farmers as respondents. Data analysis was conducted using the Household Food Security Index (IKR) and *Partial Least Square* (PLS) methods. The results showed that the Household Food Security Index for tidal rice farmers in Banjar Regency is classified as food insecure with an average index value of 0.38. Based on the Partial Least Square analysis of the household food security model for tidal rice farmers in Banjar Regency, a *normed fit index* (NFI) value of 0.720 was obtained, indicating that the model is only 72.0% good and acceptable. The more parameters/indicators in a model, the higher the NFI value produced. This is evidenced by the fact that out of 23 tested indicators, only 14 indicators met the requirements for PLS analysis to continue. From the evaluation of the structural model, it was found that the farmer capacity variable had no significant effect, while the variables of tidal land obstacles, food availability, food access, and food consumption had a significant effect on the household food security of tidal rice farmers in Banjar Regency.

KEY WORDS
Food security, farmer households, tidal rice fields, PLS, index, local rice.

Understanding food security as a system should be approached by starting with household food security, as it is possible for a region to be food secure at the regional level but at the household level, it is vulnerable to food insecurity and vice versa. Therefore, understanding household food security is crucial (Husaini & Anjardiani, 2022).

Fulfilling the food needs is greatly determined by food production, while on the other hand, food production is determined by land conditions, which can be seen in tidal rice fields. Tidal swamp land is included in marginal land with physical, biological, and chemical soil conditions that are less fertile. With these land conditions and the fact that farmers mostly grow local rice, the production and productivity are relatively low. This leads to a disruption in food availability.

The food security of households should not only be viewed from the perspective of food availability, but also from the perspective of food accessibility which is greatly influenced by the condition of infrastructure and facilities as well as the income earned by farmers, which is closely related to food production as one of their sources of income. With household income derived solely from local rice farming in marginal land conditions, the availability and accessibility of food will be disrupted, which in turn will disrupt household food consumption (Kirnadi & Zuraida, 2020).

To maintain local varieties while also trying new ones, the mindset of farmers there develops based on decades of experience in rice farming. This is a depiction of the condition of the land, the capacity of the farmers, and the development of farming technology in anticipating the climate change that is taking place (Harvian & Yuhan, 2020), Is very interesting to be analyzed through a model of household food security resilience among rice farmers.

The term "model" can be interpreted as a design, or a description that depicts a concept or system often presented in a simplified form or abstraction. Therefore, in relation to food security, it is a conceptual design from a simplified perspective in explaining the food security of a region and can provide solutions or recommendations for handling food problems effectively.

There are two objectives underlying this research, namely: (1) Analyzing the level of food security of household farmers in tidal swamp rice fields in Banjar District; and (2) Analyzing the influence of farmer capacity, availability and access to food, as well as food consumption on the food security of household farmers in tidal swamp rice fields in Banjar District.

This research is expected to provide benefits in the following areas: (1) To determine the level of household food security among tidal swamp rice farmers in Banjar Regency; (2) To analyze the influence of farmer capacity, food availability and access, as well as food consumption on household food security among tidal swamp rice farmers in Banjar Regency; (3) To be used as consideration in detecting the level of food vulnerability in Banjar Regency early on, in order to take effective and efficient preventive measures; (4) To be used as consideration and evaluation for the Government as the policy maker in carrying out its duties and functions in development efforts in its region; (5) To broaden the knowledge in finding appropriate solutions to the problems faced by researchers, readers, or institutions applying the results of this research.

METHODS OF RESEARCH

This research was conducted using a survey method in Banjar Regency, where the rice fields have tidal swamp wetland type of land. The research was carried out from May 2022 to March 2023, starting from the proposal stage, data processing, until the completion of the research report. The data used in this research consists of primary data (interviews with farmers) and secondary data sourced from the Banjar District Agricultural Office, the Banjar District Central Statistics Agency, and the Banjarbaru Swamp Land Agricultural Research Institute (Balittra). The sample used in this study comprises 60 households of rice-farming farmers in tidal swamp land.

The selection of districts was purposive, based on the condition that the rice fields have wetland and tidal swamp characteristics and the farmers plant local rice varieties in Banjar Regency. Based on data and reports from the SP-Lahan by the Agricultural Extension Officer of Banjar Regency, there were six districts that met the above criteria, namely Sungai Tabuk, Aluh-aluh, Gambut, Beruntung Baru, Kertak Hanyar, and Tatah Makmur. From these six districts, Sungai Tabuk and Aluh-aluh were randomly selected, with 21 villages selected in Sungai Tabuk and 19 in Aluh-aluh. Two villages were randomly chosen from each district, namely Bunipah and Simpang Warga in Aluh-aluh, and Keliling Benteng Ilir and Tajau Landung in Sungai Tabuk. Furthermore, 15 households of rice-farming farmers were randomly selected from each village, making a total of 60 participants.

To analyze the first research objective, which is the level of household food security among tidal swamp rice-farming households in Banjar Regency, the Household Food Security Index (HFSI) will be used with the following formula:

$$IKR_J = \frac{X_{ij} - X_{ijmin}}{X_{ijmax} - X_{ijmin}}$$

Where:

- IKR_J: Household Food Security Index for the j-th aspect of rice-farming households;

- X_{ij}: Value of the i-th indicator; j-th aspect;
- X_{ijmin}: Minimum value of the i-th indicator; j-th aspect;
- X_{ijmax}: Maximum value of the i-th indicator; j-th aspect.

The variables used in this study consist of exogenous variables, namely household capacity of rice-farming households (X_1), constraints on tidal swamp land (X_2), food availability (X_3), food access (X_4), and food consumption (X_5). Meanwhile, food security (Y) itself is the endogenous variable. The following are the indicators that make up these variables:

Table 1 – Research Variables

Latent Variables		Indicators
Farmer household capacity (X_1)	X_{11}	Age of the farmer
	X_{12}	Farmer education
	X_{13}	Age of RT mother
	X_{14}	Education of RT mothers
	X_{15}	Farm experience
	X_{16}	Number of RT members
Tidal land barriers (X_2)	X_{21}	Drainage/irrigation
	X_{22}	Pest attacks
	X_{23}	High tide overflow
	X_{24}	Flood
Food availability (X_3)	X_{31}	Land area
	X_{32}	Food prices
	X_{33}	Food production
	X_{34}	Grain remaining a year
	X_{35}	Farm income
Food access (X_4)	X_{41}	Road conditions
	X_{42}	Access to the market
	X_{43}	Means of transportation
Food consumption (X_5)	X_{51}	Number of illnesses/year
	X_{52}	Cooking water source
	X_{53}	Ready-to-eat food
	X_{54}	Food diversity
Food security (Y)	Y_1	Farmer household food security index

Furthermore, to calculate the average composite household food security index of tidal swamp rice farmers, the following formula is used:

$$I_{rt} = \frac{\sum_{i=1}^{n} IKR_J}{Total\ Aspects\ of\ Food\ Security}$$

Where:

- I_{rt}: The average composite food security index of farmer households;
- IKR_J: The value of the food security index for aspect j.

Table 1 – The range of values for the food security level of tidal land rice farmer households

Range of values	Criteria
0,00 – 0,25	Food insecurity
>0,25 – 0,50	Food vulnerability
>0,50 – 0,75	Food insufficiency
>0,75 – 1,00	Food security

Source: Rahmi et al., 2013.

To determine the range value of food security level of farmer households, a range value between 0 to 1 is used as shown in Table 1.

To test the research hypothesis, a statistical hypothesis is used, namely:

- H_0: IKR = 0,25;
- H_1: IKR < 0,25.

The hypothesis test is performed using the formula:

$$t_{hit} = \frac{\overline{IKR} - 0{,}25}{S/\sqrt{n}}$$

Where: S = Sample standard deviation; n = Sample size.

Decision rule:

- Reject H0 if thit > ttab (α = 0.05);
- Accept H0 if thit ≤ ttab (α = 0.05).

To analyze the influence of farmer capacity, food availability and access, and food consumption on the food security of farmer households, a model fit analysis of the structural equation was conducted using *Partial Least Squares* (PLS) with the assistance of *SmartPLS software.*

Next, a systematic sequence of steps was performed as follows.

- Obtaining a concept and theory-based model for designing a structural model (relationships between latent variables) and its measurement model (relationships between indicators and latent variables) based on problem formulation and literature review;
- Creating a path diagram that explains the pattern of relationships between latent variables and their indicators.

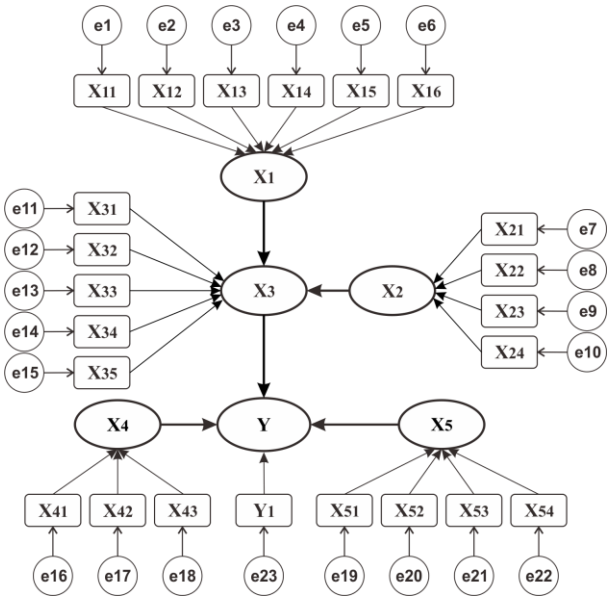

Figure 1 – Food security model of paddy farmer households in tidal swamp land in Banjar Regency

Converting the path diagram into an outer model equation:

- Exogenous latent variable: $X = \lambda_x \xi + \delta$;
- Endogenous latent variable: $Y = \lambda_y \eta + \varepsilon$.

Where:

- X: the number of exogenous latent variables;
- λ: loading matrix between exogenous variables and their indicators
- ξ: The number of indicators of exogenous variables;
- δ: Measurement error vector of exogenous variable indicators;
- η: The number of indicators of endogenous variables;
- ε: Measurement error vector of endogenous variable indicators.

The inner model or measurement of the internal parts is also known as a structural model. A structural model is a model that connects latent variables. The equation for the relationship between latent variables can be written as follows:

$$\eta_{Resilience\ of\ Food\ Security} = \gamma_1\xi_1 + \gamma_2\xi_2 + \gamma_3\xi_3 + \gamma_4\xi_4 + \gamma_5\xi_5 + \zeta$$

Performing the evaluation of *goodness of fit*, which is evaluating the measurement model (*outer*) by examining validity and reliability. If the measurement model is valid and reliable, then the next step can be taken, which is evaluating the structural model (Janadari et al., 2016).

RESULTS AND DISCUSSION

The characteristics of farmers are one of the essential aspects because they can describe the ability or capacity of farmers in cultivating rice in tidal lands. Respondents' characteristics are characterized by age, educational attainment, experience in cultivating rice, and the number of dependents in the family. The description of the farmers' characteristics is shown in Table 2.

Table 2 – Characteristics of Respondent Farmers in Banjar Regency

Indicators	Farmer characteristics			
	Average	Min	Max	SD
Age of the farmer	50	30	70	11,42
Farmer education	7	3	18	3,20
Age of RT mother	46	27	70	11,41
Education of RT mothers	7	3	15	2,87
UT Experience	25	1	45	14,67
A number of RT members	4	2	6	1,09

Source: Processed from primary data, 2022.

The age of farmers is relatively diverse, with an average age of 50 years and a standard deviation of 11.42. The youngest farmer is 30 years old, while the oldest is 70 years old, which is beyond the productive age limit of 65 years. This condition results in 5% of farmers being over the productive age limit, while 95% of farmers are still of productive age. From this, it can be seen that the prospects for household food security of farmers in the future have a significant opportunity to continue to grow.

On average, farmers have completed education for 7 years, which means that on average, farmers can only complete their primary education but not their junior high school education. The research shows that 17% of farmers did not complete their primary education, while the remaining 83% of farmers have completed their primary education. This means that the level of education of farmers in Banjar Regency is relatively good.

Similarly to education, farming experience can also be considered as one of the means for farmers to gain new knowledge in farming. The longer a farmer is involved in farming, the more new things they can discover. The average farming experience of farmers is 25 years with a standard deviation of 14.67. The minimum farming experience is 1 year and the maximum is 45 years. This shows that farmers in Banjar Regency have relatively good experience and can be responsive in responding to unexpected situations in farming.

The number of family members or dependents is like two different sides, where on one hand, family dependents can become a source of labor and even help increase income in the household. However, on the other hand, family dependents can also become a consumption burden for the household, especially if the members of the household are still under age or have passed the productive age, meaning elderly. The average number of family dependents of the respondents is 3 people with a standard deviation of 1.09. This number of family dependents is also relatively diverse, with the smallest number being 1 dependent and the largest number being 5 dependents (Table 2).

The research results indicate that over all the household food security system of farmers in Banjar Regency is included in the vulnerable food category with an average index value of 0.3841 or 38.41 of the national IKP (Table 3). Based on the t-test results, the t_{hit} value obtained is 4.71. If this number is compared to the t-table results at a significance level

of 1%, which is 2.392, it is greater. Therefore, the null hypothesis (Ho) is rejected and the alternative hypothesis (Hı) is accepted.

Table 3 – Index of Food Security of Farmer Household in Tidal Wetland Rice Farming in Banjar Regency

Food Security Subsystem	Index	SD	Criterion
Food availability	0,3253	0,12	Food insecure
Food access	0,4120	0,13	Food insecure
Food consumption	0,4351	0,11	Food insecure
Food security	0,3841	0,08	Food insecure

Source: Processed from primary data, 2023.

The research results differ greatly from the Food Security Index (IKP) released by the Food Security Agency (Ministry of Agriculture) in 2021, where Banjar Regency is included in the category of very food-secure with an average index value of 80.72 (Badan Ketahanan Pangan, 2021). The same thing applies when compared to the results of the GFSI (*Global Food Security Index*) calculation with a score between 55-69.9, which is classified as moderate (Badan Pengawasan Keuangan and Pembangunan, 2022). The low value of household food security index among farmers in Banjar Regency is due to monoculture farming practices, which only focuses on a single commodity using local varieties with low potential yields, and still at IP100. The tidal land type also has an impact on the low production of rice due to low soil fertility, as well as the lack of infrastructure which is not yet fully functional.

The research results showed that the household food availability index for Kabupaten Banjar was 0.3253 with a standard deviation of 0.12 (Table 3), which means that the food availability in this district is relatively low and relatively consistent among households, or it is classified as food insecure. In other words, the availability of food for farmer households has not been able to meet their minimum consumption needs.

Table 4 – Index of Household Food Availability Variables for Swamp Rice Farmers in Banjar Regency in 2022

Criterion	Index Value Range	Proportion of Variable Index	
		Farmer Households	Food Availability (%)
Food insecurity	0,00 – 0,25	18	30,00
Food insecure	>0.25 – 0.50	38	63,33
Lack of food	>0.50 – 0.75	4	6,67
Food security	>0.75 – 1.00	0	0,00
	Sum	60	100,00

Source: Processed from primary data, 2022.

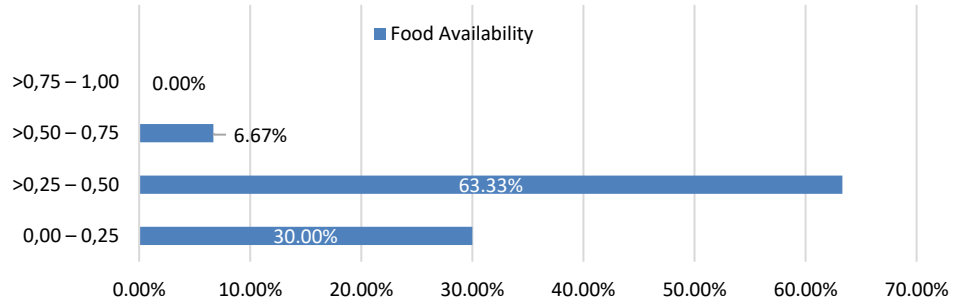

Figure 2 – Graph of the Index of Food Availability Variables for Households of Swamp Paddy Farmers in Banjar District in 2022

In terms of food availability variable, farmer households tend to fall into the category of food vulnerability, namely 63.33% and 30.00% are food insecure. One of the reasons is

because the remaining rice/paddy stocks stored by farmer households are sold for other purposes deemed urgent, such as religious events, weddings, children's education expenses, and others, with the money they obtain later being used to buy rice. On the other hand, food prices (rice) feel expensive during the pre-harvest season or rainy season. This will have a negative impact if the resulting rice production is also low. To improve food availability, diversification of agricultural commodities is one of the factors to overcome the weakness of using local rice varieties and obstacles in tidal land which result in low food production.

The index for household farmers' access to food is 0.4120, which is classified as food vulnerable, with a standard deviation of 0.13, meaning that access to food in Banjar district is relatively low and there is little variation among households (Table 3).

Table 5 – Index of Variable Access to Food of Farmers' Households in Swampy Rice Fields in Banjar District in 2022

Criterion	Index Value Range	Proportion of Variable Index	
		Farmer Households	Food Access (%)
Food insecurity	0,00 – 0,25	7	11,67
Food insecure	>0.25 – 0.50	46	76,67
Lack of food	>0.50 – 0.75	6	10,00
Food security	>0.75 – 1.00	1	1,67
	Sum	60	100,00

Source: Processed from primary data, 2023.

Two indicators were included in the PLS analysis, namely the condition and quality of the road and the distance of households to the market. The research results show that the majority of households, which is 76.67%, are categorized as vulnerable in the index of access to food, while only 1.67% of farmer households are considered food secure. The condition of the road connecting households to the market is relatively varied, with some already paved but with narrow lanes that can only be passed by four-wheeled vehicles. Some roads are unpaved (rocky), and some households have to access food through the river route.

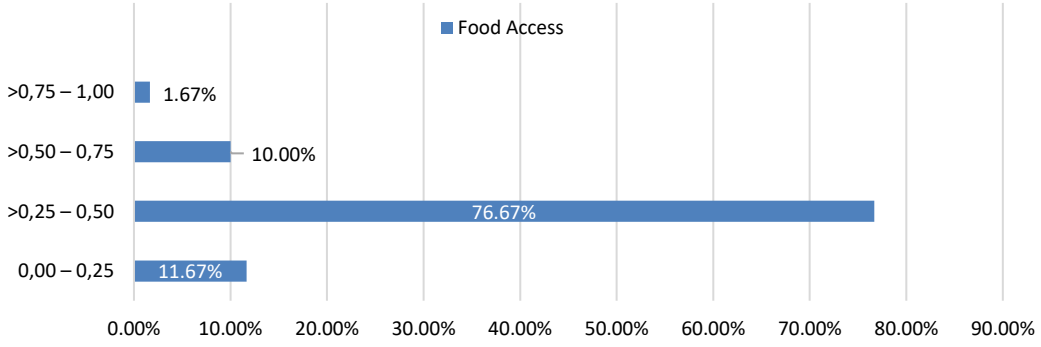

Figure 3 – Graph of Access to Food Variable Index for Lowland Rice Farmer Households in Banjar Regency in 2022

The next variable is the distance of each household to the nearest traditional market, which varies considerably from the closest being around 0.9 km and the furthest being around 16 km, resulting in an average distance of 15 km. This situation makes it difficult for each household to access food due to the time, energy, and transportation costs required, so it requires more attention and prioritization from the Banjar District Government.

The index number for household farmers' food consumption is 0.4351 with a standard deviation of 0.11, which means that food consumption among household farmers of tidal swamp rice in Banjar Regency is categorized as food insecure (Table 3).

Table 6 – Index of Food Consumption Variable of Swamp Rice Farmer Household in Banjar District in 2022

Criterion	Index Value Range	Proportion of Variable Index	
		Farmer Households	Food Consumption (%)
Food insecurity	0,00 – 0,25	5	8,33
Food insecure	>0.25 – 0.50	35	58,33
Lack of food	>0.50 – 0.75	20	33,33
Food security	>0.75 – 1.00	0	0,00
	Sum	60	100,00

Source: Processed from primary data, 2023.

All indicators that form the variable of food consumption are still relatively low, including the number of illnesses per year, the source of water used for consumption purposes, and the monthly cost incurred to purchase ready-to-eat food. Among the three main variables, only food consumption has the smallest level of food vulnerability, which is 8.33%. This can be said that the level of food consumption of households of tidal swamp rice farmers in Banjar District is already heading towards improving nutrition and concern for a healthy environment. The health of household members is one of the indicators that determine their food consumption. As for the health condition of tidal swamp rice farming household members in Banjar District, they rarely experience illnesses, and this is very good as a reflection of household food resilience.

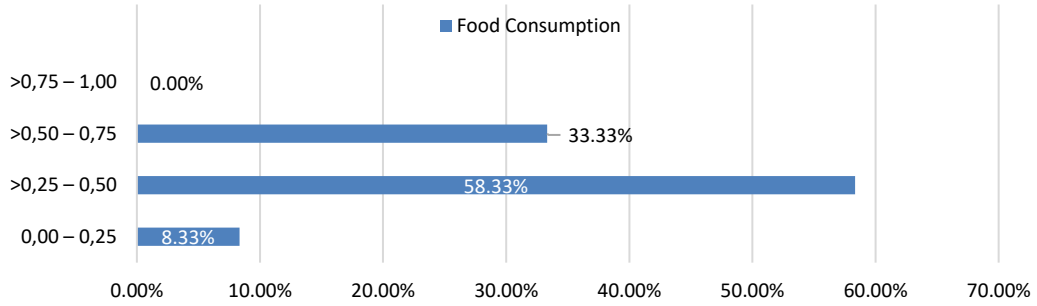

Figure 4 – Graph of the Index of Food Consumption Variable of Swamp Rice Farmer Households in Banjar Regency in 2022

The source of water used by households for daily activities tends to come from the river, such as for cooking and drinking, only a small portion uses well water and PDAM for household consumption. If the source of water for consumption comes from the river, it is feared that the water source is polluted with waste, chemicals, or carriers of diseases for the body. They may already be aware of the dangers that will occur, but using water sources from the river has its advantages, namely being more practical and without cost. Therefore, health education needs to be intensified to make household life healthier.

Looking at the amount spent by farmer households on ready-to-eat food, it is still low due to their income. The results of the study interpreted through the food consumption variable index show that 58.33% of farmer households are still food insecure. This is regardless of their frugal lifestyle, but in general, the higher the family income, the greater the expenses. The average income of the respondent farmers is Rp. 49,673,- per household per day.

To determine the influence of the variables forming the food security system and the suitability of the model, an analysis was conducted using the *partial least square* (PLS) method.

Many indicators theoretically can be used to determine the level of food security of farmer households. The theoretical investigation shows that there are 23 indicators that can be used to determine the food security of farmer households.

However, to determine which indicators truly serve as the determinant of food security

of farmer households, confirmation is necessary. Before using those indicators for estimation purposes, the model's suitability analysis with the data is conducted first.

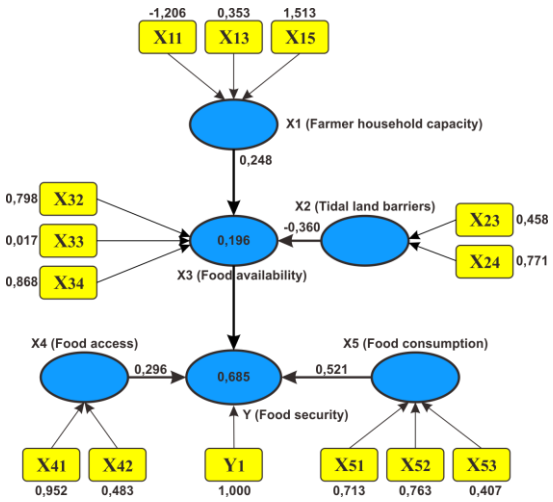

Figure 5 – Model of food security of rice farmer households in tidal lowland areas in Banjar Regency

Based on the partial least square analysis shown in Figure 5 regarding the household food security model of tidal rice farmers in Banjar Regency, the *normed fit index* (NFI) values obtained are as follows.

Table 7 – Model Fit Values for Food Security of Rice Farmer Household in Tidal Wetlands in Banjar District 2022

Criteria	Saturated Model	Estimated Model
SRMR	0.124	0.128
d_ULS	1.607	1.724
d_G	0.513	0.580
Chi-Square	128.416	144.727
NFI	0.720	0.685

Source: Processed from primary data, 2023.

The closer the NFI is to the number 1, the better the fit. A NFI value above 0.720, which is interpreted as 72.0%, indicates that the model is good and acceptable. The more parameters/indicators in a model, the higher the NFI value. This is evidenced by the 23 indicators tested, only 14 indicators meet the requirements for further PLS analysis. Source: Processed from primary data, 2023.

In construct validity, an indicator is considered valid if it has a minimum *loading factor* of 0.7 towards the intended construct.

Table 8 – *Loading Factor* of Household Food Security Model for Swamp Rice Farmers in Banjar Regency in 2022

Indicator	X_1	X_2	X_3	X_4	X_5	Y
X_{11}	0.331					
X_{13}	0.424					
X_{15}	0.826					
X_{23}		0.672				
X_{24}		0.898				
X_{32}			0.552			
X_{33}			0.322			
X_{34}			0.638			
X_{41}				0.879		
X_{42}				0.339		
X_{51}					0.635	
X_{52}					0.491	
X_{53}					0.425	
Y_1						1.000

Source: Processed from primary data, 2023.

However, there is still room for tolerance to adjust the remaining indicators logically based on scientific references. This test is conducted to validate the values obtained from the respondent questionnaire.

After obtaining all the valid measurement indicators, discriminant validity evaluation is carried out. In this case, discriminant evaluation is done by comparing the value of *square root of average variance extracted* (AVE) of each latent construct with the correlation between other constructs in the model.

Table 9 – Values of AVE for Variables of Food Security of Farmer Households in Tidal Swamp Land in Banjar Regency in 2022

Variable	Composite Reliability	AVE
X_1 (RT capacity)		
X_2 (PS Resistance)		
X_3 (Food Availability)		
X_4 (Food Access)		
X_5 (Food Consumption)		
Y (RT Food Security)	1.000	1.000

Source: Processed from primary data, 2023.

The data above which shows AVE values greater than 0.50 is fulfilled by all latent variables, which means that one variable is able to explain more than half of the variance of its indicators on average.

Next, a reliability test was conducted using the *composite reliability* method because it is considered better in estimating the internal consistency of a construct (an easily observable concept). The rule used for the *composite reliability* value is greater than 0.7. Based on the analysis results presented in Table 9, the *composite reliability* value has been fulfilled above 0.7, indicating that all research variables have high reliability values.

The structural model assessment procedure is necessary for analysis and interpretation in order to obtain conclusions about the food security model and its subsystems. The obtained R square value ≥ 0.50 - < 0.75, namely 0.685, is classified as moderate (Hair et al., 2014).

The value indicates that 68.5% of the variance in the endogenous variable Y can be explained by the exogenous variable X.

Table 10 – R Square Values of Food Resilience of Farmers in Tidal Land in Banjar Regency in 2022

Variable	R Square	R Square Adjusted
Y	0.685	0.668

Source: Processed from primary data, 2023.

Based on the results of T-statistics analysis, it was obtained that hypothesis testing values through bootstrapping procedure, out of 5 exogenous variables, only one variable which is household capacity of farmers is not significant at the 5% level of significance. In hypothesis testing, it can be said to be significant when the T-statistics value is greater than 1.96, while if the T-statistics value is less than 1.96, it is considered not significant (Ghozali, 2016).

Table 11 – Effect of Exogenous Variables on Endogenous Variable of Food Security in Tidal Land of Banjar District

Variabel	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
X_1 -> X_3	0.248	0.282	0.149	1.667	0.096
X_2 -> X_3	-0.360	-0.376	0.118	3.053	0.002
X_3 -> Y	0.220	0.225	0.100	2.201	0.028
X_4 -> Y	0.296	0.289	0.065	4.539	0.000
X_5 -> Y	0.521	0.524	0.073	7.104	0.000

Source: Processed from primary data, 2023.

The next test is through predictive relevance (Q^2) using blindfolding procedure. If the value of $Q^2 > 0$, it can be said to have good observation value, while if the value of $Q^2 < 0$, it can be stated that the observation value is not good.

Based on the data presented in Table 12, it can be known that the Q^2 value for the dependent variable (endogenous) is 0.632. By looking at that value, it can be concluded that this research has good observation value because the $Q^2 > 0$ (zero) (Chin, 1998). In other words, the variables used in the model can be further analyzed.

Table 12 – *Predictive Relevance Values* of Food Security of Peasant Household in Tidal Land in Banjar Regency

Variable	SSO	SSE	Q^2
X_1	180.000	180.000	
X_2	120.000	120.000	
X_3	180.000	178.794	0.007
X_4	120.000	120.000	
X_5	180.000	180.000	
Y	60.000	22.080	0.632

Source: processed from primary data, 2023.

From the results of the measurement model evaluation and the structural model evaluation, the following interpretations were obtained:

1. The influence of farmer capacity on the availability of local rice farmer household food, obtained a coefficient value of 0.248. Based on the results of the T-test, it is not significant at α=10%, therefore the null hypothesis (Ho) cannot be rejected. In other words, the farmer capacity formed by indicators of farmer age, farmer education, household head age, household head education, farming experience, and the number of family members does not significantly affect food availability, although the direction of the relationship is positive. This can be seen from the T-Statistic obtained through bootstrapping procedures which is 1.667, less than the T-table value of 1.672, thus it is not significant at the significant level of α=10%. This is because producing rice through local rice cultivation does not require special education and long farming experience. It is just like a culture that is already ingrained in the lives of the local farming community. In other words, local rice farming is not solely determined by the farmer's ability or capacity.
2. The influence of obstacles or constraints of tidal land on the availability of food for local rice farming households obtained a coefficient value of -0.360 (negative), based on the results of the T-test, significantly different from zero at α = 1%, thus the null hypothesis (Ho) is rejected and the alternative hypothesis (Hı) is accepted. It can be interpreted that obstacles of tidal land formed by drainage indicators, pests and diseases, tidal water overflow, and disasters have a significant effect on food availability. The analysis can be seen from the results of the T-test through bootstrapping procedure obtained a T-Statistic of 3.053 which is greater than 2.663, so the interpretation is significant at the α=1% significance level. Although the influence is significant, the direction of the relationship with food availability is negative, which means that the lower or smaller the obstacles, the higher the rice production, and can have an impact on strengthening the food security of farming households.
3. The effect of food availability on the food security of local rice farming households obtained a coefficient value of 0.220, based on the results of the T-test, significantly different from zero at α=5%, so the null hypothesis (Ho) can be rejected and Hı is accepted. It can be interpreted that food availability formed by indicators of land area, food prices, food production, and rice reserves have a significant effect on food security. The value obtained from the T-test through *bootstrapping* procedure is 2.201 which is greater than 2.001 or significant. Based on the results of this study, food availability has a positive impact on food security, which means that the more

affordable and fulfilled the food availability, the more resilient the food security of the farming households (Prasetyaningtyas & Nindya, 2017). This is further compounded by the fact that Banjar Regency is a food surplus region (Fauzi et al, 2022) This also helps to facilitate the availability of food for farming households.

4. The effect of food access on the food security of local rice farming households obtained a positive coefficient value of 0.296, based on the results of the T-test, significantly different from zero at α=1%, thus the null hypothesis (Ho) is rejected and the alternative hypothesis is accepted. This means that food access formed by indicators of road conditions and market access has a significant effect on food security. Through the *bootstrapping* procedure, the T-test result obtained a T-Statistic of 4.539, which is greater than 2.663, indicating significance at the 1% level. This is due to the good road conditions and short distance or easy accessibility, which can save time and reduce household expenses for farmers. As access to food improves, particularly with better road conditions, the population's access to food in the district will also improve, leading to increased household food security.
5. The influence of food consumption on the food security of local rice farmer households is indicated by a coefficient value with a positive direction of 0.521. Based on the results of the T-test, the significance level is different from zero at α=1%, therefore the null hypothesis (Ho) can be rejected and the alternative hypothesis is accepted. This means that food consumption, as indicated by the number of illnesses, water sources, and ready-to-consume food, significantly affects food security. Through *bootstrapping* procedures, the *T-statistic* test result obtained a value of 7.104, which is greater than 2.663. Thus, the interpretation is significant at the real level of α=1%. The lower frequency of illnesses means that the consumed food provides sufficient and good nutrition for the body. Similarly, the use of clean water sources that are not contaminated by waste will provide health benefits for the body. The ability of farmer households to purchase other ready-to-consume and diverse foods also indicates good household food security.

CONCLUSION AND SUGGESTIONS

Based on the research results, the food security of tidal swamp rice farmer households in Banjar Regency can be concluded as follows:

1. The level of food security for tidal swamp rice farmer households in Banjar Regency is significantly categorized as food vulnerable;
2. The variables that significantly affect the food security of tidal swamp rice farmer households are land barriers, food availability, food access, and food consumption. Meanwhile, the farmer's capacity variable does not significantly affect food availability and indirectly, the food security of tidal swamp rice farmer households in Banjar Regency.

Based on the results of the research and analysis conducted, the following recommendations can be suggested:

1. To overcome the food vulnerability of tidal swamp rice farmer households in Banjar Regency, it is necessary to diversify the agricultural businesses besides rice cultivation, and to use superior varieties such as Inpara 2 or other suitable superior varieties for tidal swamp conditions, to improve the planting index;
2. To enhance the food security of farmer households, capacity building of farmers and availability of food should be improved through empowering farmers and applying applicable technologies. In addition, farmers can utilize the light credit program (KUR) to engage in other commodities such as corn, oranges, or poultry farming to increase their income;
3. The improvement of the capacity of farmer households in terms of family health can be achieved through health education to ensure that the consumed food meets the nutritional requirements and prevents the onset of diseases.

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