



UDC 332

## THE RELATIONSHIP BETWEEN FOOD SECURITY AND SOCIOECONOMIC CHARACTERISTICS OF VEGETABLE FARMER FAMILIES IN LIANG ANGGANG DISTRICT, BANJARBARU CITY

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### ABSTRACT

Banjarbaru is a vegetable producing area in South Kalimantan Province. Vegetable farmers in Banjarbaru City not only supply vegetables in Banjarbaru City itself, but also supply vegetable needs in Banjarmasin City. Based on data from BPS Banjarbaru City in 2022, the production of green leaf vegetables that are widely produced is in the form of kale (4,164 quintals), petsai (5,752 quintals), spinach (2,453 quintals). In addition to green leafy vegetables, other vegetables that are also quite high such as mushrooms (13,716 quintals), tomatoes (5,070 quintals), cucumbers (3,671 quintals). All types of vegetable crops tend to experience a decrease in production compared to the previous two years, except for fungal plants. The objectives of this study are: 1) Identify and analyze the family and socioeconomic characteristics of vegetable farming families 2) Analyze the food security of farming families. 3) Analyze socioeconomic characteristics related to the level of food security of vegetable farming families in Liang Anggang District. The analysis used is descriptive analysis, HFIAS (*Household Food Insecurity Access Scale*) Indicator Guide indicator and biserial point correlation analysis. The results of the analysis show that: 1) The characteristics of vegetable farmer households as independent variables in this study include variables of farmer household income, proportion of percent of food expenditure, number of household members, formal education of housewives, availability of rice and area of vegetable farming. 2) The level of food security of vegetable farmer households in Liang Anggang District Included in the food security category, which is 83.33%, and the remaining 16.67% is included in the category of light food insecurity. 3) All variables of socioeconomic characteristics have a significant relationship with the level of food security of vegetable farmer households in Liang Anggang District.

### KEY WORDS

HFIAS, food security, household, vegetables, farming.

Food Security is a condition for the fulfillment of food for the country up to individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable, and affordable and does not conflict with religion, beliefs, and culture of the community, to be able to live healthy, active, and productive lives in a sustainable manner. The development of food security and nutrition is carried out systemically by involving cross-sectors. This approach is directed towards realizing adequate food availability through domestic food production and trade; achieving stability of food availability and access in macro-meso and micro terms; adequate quality (diversity and food safety) and quantity of food consumption supported by infrastructure improvements (Tono et al, 2022).

The issue of food security is technically directly proportional to the availability of agricultural business land. This problem arises due to the rate of population growth, decreasing agricultural area, extreme climatic conditions and land quality, causing food insecurity (Bahar et al., 2020). The right step for the government to deal with conditions like this is to conduct an analysis of food security to overcome food insecurity. Prevention efforts and efforts to overcome them must be implemented quickly and managed properly to avoid



food insecurity. Food insecurity can be overcome by improving food security (Fauzi et al., 2019).

The Ministry of Agriculture reviewed important elements of the draft communiqué/declaration of the G20 Agriculture Ministers of the Indonesian Presidency in 2022 through the 2nd Meeting of Agricultural Deputies (ADM). The meeting discussed three main priority issues in agriculture. First, the focus is on building a resilient and sustainable global food system. Second, about creating an open, fair, predictable, and transparent agricultural trade system to ensure food affordability for all. Third, they encourage the development of innovative agricultural entrepreneurship through digitalization to improve the standard of living of farmers, especially in rural areas (Ministry of Agriculture of the Republic of Indonesia, 2022).

Law No. 18 of 2012 on food defines food security as the basis for the state to ensure access to food for every individual. This food security is realized by ensuring the availability of adequate, safe, diverse, nutritious, equitable, affordable food, respecting religious values, beliefs and culture. The Food Law not only focuses on food security, but also explains and strengthens its achievements through *food sovereignty (food sovereignty)* with *food resilience* and food safety (*food safety*).

Food security, the interpretation of *food security* covers many aspects and a wide scope, so everyone tries to translate it according to conditions and situations that develop from time to time. Food security in this period emphasizes two important aspects of food security, namely food security in the sense of food availability at the national (and regional) levels and stable access at the local level (Food Security Council, 2010).

Broadly speaking, household needs are divided into two broad categories, namely food needs and non-food needs. The amount of income a household spends on food (as an indicator of total expenditure) can be used as an indicator of the welfare of that household. The higher the percentage of food expenditure, the less prosperous the household. Conversely, it can be said that the lower the percentage of food expenditure, the more prosperous the household (Purwantini, 2008).

Research conducted by Hartoni & Shafriani (2023) states that the food security of rice farmer households in tidal lands is influenced by: a) per capita farmer household income; b) the proportion of household food expenditure; c) availability of household rice; and d) the area of rice farming. 62% of food-secure rice farming households in Barito Kuala Regency, the remaining 38% are still in a food-insecure condition.

Coates *et al.* (2007) states that quantitative classification of household food insecurity levels can be done using the *Household Food Insecurity Access Scale (HFIAS)* method with *the following cut-offs*: 1) *Food Secure*, 2) *Mild Food Insecure*, 3) *Moderate Food Insecure*, and 4) *Severe Food Insecure*.

So far, the government has carried out a program to identify the level of food insecurity in each region in Indonesia with food insecurity mapping procedures or FSVAs (*Food Security and Vulnerability Atlas*). This program focuses more on mapping district or regional areas. The guidelines used for mapping food insecurity at the regional or district level are based on markers that have been formulated by the FIA (*Food Insecurity Atlas*).

The indicators are processed on the basis of three aspects of food security, namely aspects of food availability, aspects of food access and aspects of food utilization. In addition to these three aspects, it is also based on indicators that have been formulated by the *Food Insecurity Atlas (FIA)* which cannot be separated from the real conditions of farmer households. The indicators that have been processed consist of 15 indicators representing aspects of availability, aspects of access and absorption of food.

The realization of food security at the macro level (national and global) in the future will be increasingly difficult due to the tendency of food supply and demand movements in opposite directions. Food production or supply will grow more difficult because it faces various physical, economic, and environmental constraints; While food demand will continue to grow in line with population growth, economic development. and the dynamics of the strategic environment (Suryana, 2014).



Banjarbaru City is a vegetable center in South Kalimantan. Vegetable farmers in Banjarbaru not only meet the needs of vegetables in their own area, but also supply vegetables to Banjarmasin City. Production of vegetables produced in Banjarbaru City such as leeks, large chili, cayenne pepper, spinach, kale, chickpeas, long beans, cucumbers, petsai, eggplant, tomatoes and mushrooms. Based on data from the Central Statistics Agency (BPS) of Banjarbaru City in 2022, analysis of vegetable production shows that kale (4,164 quintals), petsai (5,752 quintals), and spinach (2,453 quintals) occupy the top position as the type of green leafy vegetables with the highest production rate. Other vegetable commodities that also showed significant production performance were mushrooms (13,716 quintals), tomatoes (5,070 quintals), and cucumbers (3,671 quintals).

Liang Anggang District is the largest vegetable production center in Banjarbaru City, with 1,203 vegetable farmers recorded. Liang Anggang District is divided into four villages, namely Landasan Ulin Barat, Landasan Ulin Selatan, Landasan Ulin Tengah and Landasan Ulin Utara. Each of these villages has 182 farmers, 46 farmers, 119 farmers and 856 vegetable farmers.

As an area that is a production center, the role of vegetable farmers in Liang Anggang District is very vital to the community's food security. This is because farmers' vegetable production is not only consumed by their households, but also public consumption in general (sold). Vegetables consumed provide food sufficiency in meeting the needs of vitamins and minerals. Based on this explanation, research is needed on vegetable farmers in Liang Anggang District, which is the vegetable producer itself, whether their household food has been fulfilled or the food security of the vegetable farmer's household.

### METHODS OF RESEARCH

This research was conducted in Liang Anggang District. The research location was chosen because Liang Anggang District is the largest vegetable production center in Banjarbaru City which not only supplies vegetables in Liang Anggang District itself, but also supplies vegetable needs in other districts and cities.

The population in this study is vegetable farmers in Liang Anggang District with a total of 1,203 people. The total population of vegetable farmers is spread across all villages in Liang Anggang District. The number of samples taken was 42 people, based on calculations using the binominal proportions formula. Furthermore, 42 samples of vegetable farmers were taken from all villages in Liang Anggang District. The number of samples taken in each sub-district varies, according to population variations in the sub-district. Furthermore, sampling is carried out by the *simple random sampling method*.

To answer the first goal, namely identifying the family and socioeconomic characteristics of vegetable farming families in Liang Anggang District, which is done descriptively. This descriptive analysis can be done by making data distribution based on family and socioeconomic characteristics of the vegetable farming family, using *Microsoft Office Excel*.

Table 1 – HFIAS Categories

Category	Condition
1	If [(Q1a = 0 or Q1a = 1) and Q2 = 0 and Q3 = 0 and Q4 = 0 and Q5 = 0 and Q6 = 0 and Q7 = 0 and Q8 = 0 and Q9 = 0]
2	If [(Q1a = 2 or Q1a = 3 or Q2a = 1 or Q2a = 2 or Q2a = 3 or Q3a = 1 or Q4a = 1) and Q5 = 0 and Q6 = 0 and Q7 = 0 and Q8 = 0 and Q9 = 0]
3	If [(Q3a = 2 or Q3a = 3 or Q4a = 2 or Q4a = 3 or Q5a = 1 or Q5a = 2 or Q6a = 1 or Q6a = 2) and Q7 = 0 and Q8 = 0 and Q9 = 0]
4	If [Q5a = 3 or Q6a = 3 or Q7a = 1 or Q7a = 2 or Q7a = 3 or Q8a = 1 or Q8a = 2 or Q8a = 3 or Q9a = 1 or Q9a = 2 or Q9a = 3]

To answer the second goal, namely to determine the level of food security of farmer households in Liang Anggang District, conducted through a survey using HFIAS will produce information related to food security (access) at the household level. Based on the HFIAS



Indicator Guide indicators, four types of indicators are calculated to support understanding of the characteristics and changes in household food security (access) in the surveyed population (Coates *et al.* 2007).

The categories of household food insecurity access for each household are grouped into 4 categories. The 4 categories consist of: HFIAS category 1 = Food security; HFIAS category 2 = Light food insecurity; HFIAS category 3 = Moderate food insecurity; HFIAS category 4 = Very food insecure.

To answer the third objective, namely analyzing the relationship between socioeconomic characteristics and food security of vegetable farming families in Liang Anggang District using point biserial correlation analysis. The biserial point correlation analysis is as follows:

$$r_{pbi} = \frac{\bar{X}_p - \bar{X}_q}{s} \sqrt{pq}$$

Where:

- $r_{pbi}$ : Biserial point correlation coefficient;
- $\bar{X}_p$ : Average ratio data from food insecure family groups;
- $\bar{X}_q$ : Average ratio data from food-insecure family groups;
- $s$ : Standard division of all data ratios;
- $p$ : proportion of food insecure families;
- $q$ : proportion of families not food insecure.

To test the hypothesis of the relationship between socioeconomic characteristic variables and food security of vegetable farming families in Liang Anggang District, namely by comparing  $r_{pbi}$  with  $r_{table}$ :

- $r_{pbi} > r_{table}$ :  $H_1$  accepted,  $H_0$  rejected;
- $r_{pbi} \leq r_{table}$ :  $H_1$  rejected,  $H_0$  accepted;
- $r_{table}$  in this study was 0.3044 with  $df = 40$  and  $\alpha = 5\%$ .

Conclusion of decision making:

- $H_1$  accepted: This means that there is a significant relationship between socioeconomic characteristic variables and food security of vegetable farming families in Liang Anggang District;
- $H_1$  rejected: this means that there is no significant relationship between socioeconomic characteristic variables and food security of vegetable farming families in Liang Anggang District.

## RESULTS AND DISCUSSION

The characteristics of vegetable farmer households as independent variables in this study include variables of farmer household income, proportion of food expenditure, number of household members, formal education of housewives, availability of rice and area of vegetable farming. The income of farmer households in this study can come from their farm income, and some farming families have other income from work as farm laborers and outside agriculture such as builders, stalls, motorcycle taxi drivers and others.

The number of farmers with the highest income group is between Rp69,706,078 – Rp77,710,049 per year, only 2.38% of the total farmers. Meanwhile, the number of farmers with the lowest income group is between Rp21,682,257 – Rp29,686,226 of 21.43. The average farmer household income is Rp 40,609,388 per year. Vegetable farming income, which is an *on-farm* business, contributes the most compared to income from other types of work, which is 68.64%. Furthermore, *non-farm* income, namely as builders, motorcycle taxi drivers and small businesses, contributed 21.98% of income and *off-farm* income as farm laborers of 9.38%.

The pattern of consumption expenditure of farmer households is an essential indicator that is able to reflect the economic condition and welfare level of a population. Empirically,





when farmers' household income is at a low level, the proportion of expenditure on non-food needs will decrease and switch to food needs. Conversely, when income increases, the proportion of expenditure on food needs will decrease and switch to non-food needs. Farmers need efforts to manage expenses so that with existing income, farmers can still meet the needs of their families. The average total household expenditure of vegetable farmers in Liang Anggang District is Rp26,055,475 per year consisting of food expenditure of Rp12,978,333 per year and non-food expenditure of Rp13,077,143 per year. The proportion of food consumption expenditure is the percentage of food expenditure compared to the total expenditure. The proportion of food consumption expenditure of vegetable farmers in Liang Anggang District is 50% for food expenditure and 50% for non-food expenditure.

In general, the more household members, of course, the more expenses, especially food expenditures. However, the more household members who can play a role in helping in work or business, it can certainly add value to income. The distribution of respondent farmers based on the number of family members is 35.71% of respondents have 4 household members; 30.95% of respondents had 3 household members; 19.05% of respondents had a household of 5; And the remaining 14.29% have 2 household members.

Mothers play an important role in food security. The role of mothers in domestic roles and public roles that have been owned since the beginning has become a significant factor in efforts to fulfill the availability, affordability, equity, and security and security of food. A mother's education can improve her quality, because education is a process that helps a person to change for the better, starting from knowledge, skills and attitudes. Formal education is a form of education officially recognized by the government. The results showed that farmer housewives with high school education / equivalent amounted to 38.10% or as many as 16 people, followed by housewives with elementary school graduates / equivalent by 33.33% or as many as 14 people, and junior high school / equivalent by 28.57% or as many as 12 people. The role of housewives is decisive in ensuring household food security. Education provides housewives with the skills and knowledge necessary to manage the household more effectively.

The availability of rice is an important aspect to measure how much rice meets household consumption needs based on the number of family members owned. This causes the availability of rice to be an inseparable unit with the number of family members in the household. The availability of rice in the most farmer households is between 105.27-115.42 liters/capita/year amounting to 71% of the total farmers, while only 2% of the number of farmers has rice availability between 44.31-54.46 liters/capita/year. The average availability of rice for farmer households is 101.16 liters / capita / year.

Land is a factor of production of a farm, the greater the area of land owned, the more production produced. Although it can be known, there are other production factors that determine the production results of a farm. This also applies to every farm, as well as vegetable farming. The number of farmers who do the most vegetable farming is with a land area of 0.06 hectares as much as 35.71%.

The status of household food security analyzed through surveys using *the HFIAS (Household Food Insecurity Access Scale)* method is limited to aspects of food access only. Each household's food insecurity is determined using the categories specified in *HFIAS*. Household food insecurity is expressed in one of four categories namely food security, light food insecurity, moderate food insecurity, and very food insecurity. Most vegetable farmers in Liang Anggang District fall into the food insecure category as much as 83.33%, and the remaining 16.67% fall into the category of light food insecurity.

Point biserial correlation analysis was conducted to see the relationship between socioeconomic characteristics and food security of vegetable farming families in Liang Anggang District. Biserial point correlation analysis was carried out using the help of an analysis tool, IBM SPSS Statistics. The relationship between socioeconomic characteristics of farmers and food security of vegetable farmer households in Liang Anggang District is presented in Table 2.



Table 2 – Variable relationship of socioeconomic characteristics of farmers with food security of vegetable farmer households in Liang Anggang District

No.	Variable	RPBI	Sig.	Information
1	Proportion of farmer household income	0.599	0.000	Significantly related
2	Proportion of food expenditure	-0.712	0.000	Significantly related
3	Proportion of the number of household members	-0.391	0.010	Significantly related
4	Proportion of formal education of housewives	0.404	0.008	Significantly related
5	Proportion of household rice availability	0.967	0.000	Significantly related
6	Proportion of vegetable farming area	0.386	0.012	Significantly related

Description:  $r_{table} = 0.3044$ . real test rate ( $\alpha$ ) = 0.05 bidirectional test.  
 Source: Primary data processing, 2023.

The biserial point correlation test shows the result of *the Pearson Correlation* value for the proportion of percent of farmer household income of 0.599, which means that farmer household income is significantly related to the food security of vegetable farmer households in Liang Anggang District. So, if there is an increase in farmer household income, it will cause higher food security for the farmer family.

The results of *the Pearson Correlation* value in the biserial point correlation test show results for the proportion of percent of farmer household expenditure of -0.712 which means that farmer household expenditure is closely related to the food security of vegetable farmer households in Liang Anggang District. So, if there is an increase in farmer household expenditure, it will cause lower food security of the farmer family.

The proportion of percent of farmer household members shows a result of -0.391 which means that the number of farmer household members is significantly related to the food security of vegetable households in Liang Anggang District. *Peorson Correlation value*. the number of members of negative farmer households, which shows an inverse relationship with the meaning that the fewer the number of farmer household members. the higher the food security of vegetable farmer households in Liang Anggang District.

The biserial point correlation test shows the results of *the Pearson Correlation* value for the proportion of percent of formal education of housewives of 0.404; this means that the proportion of percent of formal education of housewives is significantly related to the food security of vegetable farmer households in Liang Anggang District. So, the higher the formal education of housewives, the higher the food security of the farming family.

The *value of Pearson Correlation* on the variable proportion of household rice availability was obtained at 0.967, which means that the proportion of household rice availability is closely related to the food security of vegetable farmer households in Liang Anggang District. These results show that if the availability of household rice increases, it will lead to higher food security of these farmer households.

In the value of the proportion of agricultural land area a result of 0.386 was obtained which was significantly related to the food security of vegetable farmers in Liang Anggang District. So, if there is an increase in the area of vegetable farming land, it will cause an increase in the food security of the farmer's household.

## CONCLUSION

The characteristics of vegetable farmer households as independent variables in this study include variables of farmer household income, proportion of percent of food expenditure, number of household members, formal education of housewives, availability of rice and area of vegetable farming.

The level of food security of vegetable farmer households in Liang Anggang District is included in the food security category, which is 83.33%, and the remaining 16.67% is included in the category of light food insecurity.

All variables of socioeconomic characteristics have a significant relationship with the level of food security of vegetable farming households in Liang Anggang District.



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