

## THE SOCIO-ECONOMIC VARIABLES INFLUENCING HOUSEHOLD CONSUMPTION IN THE RURAL FARMERS LEVEL

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### Abstract

**Purpose of the study:** This study investigated the socio-economic effect on household consumption of rural farmers in South Sumatera, Indonesia.

**Methodology:** The data used were primary data obtained from an in-depth survey of 300 farmer households. The analysis method used a quantitative approach with a polynomial regression model.

**Main Findings:** The finding showed that from the four independent variables estimated, there are three which have a significant effect on farmer household consumption: household income, number of family members, and education level of the household head. Despite changes in consumption patterns between food and non-food, the process of food diversification is an important task for the government, especially to reduce dependence on rice consumption.

**Applications of this study:** This study was conducted in South Sumatra, Indonesia in the field of agricultural economics. This study can support development planning policies in the food sector in South Sumatra.

**Novelty/Originality of this study:** This study focus as efforts on the policy of diversifying food consumption needs to be synergized with the development of local resource-based food products.

**Keywords:** Consumption, Farmer, Food and Non-Food, Income, Rural Household, Socio-economic.

### INTRODUCTION

Consumption is an important factor in household economic activity. Also, consumption needs can be used as an illustration to see the welfare level of each household in the region. In microeconomic theory, individual consumption activities are influenced by income levels (Marwa, Rostartina, & Abukosim, 2009; and Pindyck & Rubinfeld, 2013). In simple terms, household consumption can be divided into two parts, namely food and non-food. Meanwhile, increasing household expenditure for food and non-food indicates that the higher the purchasing power of the household (Bashir et al., 2018). Likewise, the high level of household purchasing power also indicates that the level of household welfare is also getting better (Azwardi et al., 2016; and Mayasari et al., 2018).

The welfare level of farmer households can also be seen based on the shift in expenditure structure, that the lower expenditure proportion on food consumption can indicate an improvement in the household welfare level (Bashir & Yuliana, 2018; and Mayasari et al., 2018). On the other side, the change in the expenditure structure for household consumption as a result of the response to changes in demand for food which is getting lower compared with the expenditure proportion for non-food consumption, it's changed that indicates that the household has welfare level is getting better (Kumar et al., 2017; and Rizov, Cupak, & Pokrivcak, 2015).

Based on publication data from the Central Statistics Agency (BPS), the average growth in expenditure for household food consumption of South Sumatera in 2017 increased by 17.48%. The growth average of expenditure for the highest food consumption was dominated by vegetables at 38.20%, then followed by food and beverages at 31.11%, and tobacco at 27.73%, meat at 17.86 %, and spices at 17.67% (Table 1). However, they were food groups that grew negatively is fruits with a decrease average of (-9.41%). While based on the proportion of expenditure for the highest is food and beverages at 11.69%, then followed by tobacco at 8.65%, and paddy at 8.16% (Table 1).

Table 1 has provided accurate information on the average growth of household food consumption expenditures, as well as providing information on the proportion of per capita household expenditure for each food group in a month in South Sumatera. The development of expenditures for food consumption changed from 2015-2016, these changes can be caused by rising food prices and household income, as well as the current pattern of household consumption that has changed. An interesting phenomenon shows that the proportion of consumption for paddy is currently smaller than the consumption of food and beverage groups, and tobacco, this indicates that households have reduced demand for food consumption by consuming food and beverages more practical.

The current study by investigating household responses to rising food prices will guide the government to implement appropriate food price policies, provide information on trends in changes in food consumption over time and provide guidance for developing food diversification in the future. At present, studies in analyzing household consumption patterns of food and non-food are still interesting to study, such as studies conducted by Fharuddin et al. (2015) has found that all food groups had positive income elasticity and negative price elasticity, consistent with the demand theory, but expenditure elasticity was higher than price elasticity. Meanwhile, rice food groups have low expenditure elasticity and price elasticity where income increases and price increases insignificantly affect rice consumption. Besides, studies conducted by

Mayasari et al. (2018) in his study found that in general, socio-economic characteristics have a large share in determining household food consumption patterns and based on their elasticity value, food commodities in East Java are inelastic towards prices and more responsive to changes in income.

**Table 1:** Average expenditure for food consumption in South Sumatera Province

| Food Group                     | Average per capita expenditure per month (IDR) |                | Average Proportion of per capita Expenditures for Month (%) |              | Growth (%)   |
|--------------------------------|------------------------------------------------|----------------|-------------------------------------------------------------|--------------|--------------|
|                                | 2016                                           | 2017           | 2016                                                        | 2017         |              |
| Paddy                          | 66,231                                         | 68,509         | 9.06                                                        | 8.16         | 3.44         |
| Mobs                           | 3,563                                          | 3,971          | 0.49                                                        | 0.47         | 11.45        |
| Fish, Shrimp, Squid, Shellfish | 32,885                                         | 37,113         | 4.50                                                        | 4.42         | 12.86        |
| Meat                           | 15,027                                         | 17,711         | 2.05                                                        | 2.11         | 17.86        |
| Eggs and Milk                  | 25,527                                         | 28,297         | 3.49                                                        | 3.37         | 10.85        |
| Vegetables                     | 29,785                                         | 41,164         | 4.07                                                        | 4.90         | 38.20        |
| Nuts                           | 7,997                                          | 8,889          | 1.09                                                        | 1.06         | 11.15        |
| Fruits                         | 18,864                                         | 17,088         | 2.58                                                        | 2.04         | -9.41        |
| Oil and fat                    | 11,032                                         | 11,912         | 1.51                                                        | 1.42         | 7.98         |
| Beverage ingredients           | 16,520                                         | 18,164         | 2.26                                                        | 2.16         | 9.95         |
| Spices                         | 9,347                                          | 10,999         | 1.28                                                        | 1.31         | 17.67        |
| Other consumption              | 11,385                                         | 11,689         | 1.56                                                        | 1.39         | 2.67         |
| Food and Beverages             | 74,891                                         | 98,190         | 10.24                                                       | 11.69        | 31.11        |
| Tobacco                        | 56,891                                         | 72,667         | 7.78                                                        | 8.65         | 27.73        |
| <b>Total</b>                   | <b>379,945</b>                                 | <b>446,363</b> | <b>51.95</b>                                                | <b>53.16</b> | <b>17.48</b> |

**Source:** BPS of South Sumatera (Secondary data 2018)

Several studies that analysis food consumption patterns were carried out by them Firdaus & Cahyono (2017); Faharuddin et al. (2015); Ariani & Purwati (2015); and Mayasari et al. (2018) that the study looked more at the general pattern of household consumption, carried out at the national and provincial levels, still very rarely carried out at the rural farmers level.

Therefore, this study investigates the socio-economic variables that influence the household's consumption of rural farmers and then to see consumption patterns of food and non-food in rice farming households in South Sumatra Province. In the next section, we present the literature review as the basis of the study, the research method as a tool to obtain evidence, the results and discussion present the analysis and implication of the findings, finally presenting the conclusions of this study.

## LITERATURE REVIEW

Household consumption is an activity to fulfill needs and various other services. The amount of consumption always changes according to the income received by the household, if household income rises, then consumption also increases positively, assuming the opposite. Besides, consumption is the total expenditure to obtain goods and services in an economy within a certain period. Especially for household consumption expenditures, there are the most important factors determining among them the level of household income. Household behavior spends a portion of income to be spent called consumption expenditure. Consumption is a function of disposable income (Jappelli & Pistaferri, 2010; Keister, Benton, & Moody, 2016). In other words, the consumption function shows the relationship between the level of consumption expenditure and the level of income that is ready to spend. Keynes emphasized that in an economy, the level of consumption expenditure by households varies directly with the level of household income. The relationship between consumption and income is known as the consumption function and is generally written with the following equation:

$$Y = a + b.Y_d (a > 0, 0 < b < 1) \quad (1)$$

Where C and  $Y_d$  are modifiers that show real consumption and income respectively. Parameter shows the magnitude of autonomous consumption expenditures, namely expenditures that depend on the level of income, but are influenced by factors outside of income, such as economic expectations of consumers, availability and expected credit conditions and living standards. While parameter b illustrates the tendency for marginal propensity to consume (MPC), which is a comparison between changes in consumption and changes in income or  $b = MPC = \Delta C / \Delta Y_d$  and has a value between 0 and 1.

This implies that at a low-income level, consumption will exceed income, while the level of income is high, consumption is smaller than income. The consumption function is known as the propensity to consume (APC), which is the ratio between the amount of total consumption and income ( $\frac{C}{Y_d}$ ), or from equation 1, the magnitude of  $APC = \frac{C}{Y_d} = \frac{a}{Y_d} + b$  or  $APC = \frac{a}{Y_d} + MPC$ . The theory put forward by Keynes regarding the relationship between consumption and income has

been widely developed by economists, such as the existence of absolute income hypotheses, relative income hypotheses, permanent income hypotheses, and life cycle hypotheses. In this study, it will focus more on shifting consumption from short-term consumption to long-term.

Something is interesting in the theory of consumption, especially when occurs shifting the function of consumption from short term to long term, many are influenced by several factors (Branson, 2005), including: (1) The existence of population migration from rural to urban and residents know that the population of the city consumes higher than village consumption, so migration tends to increase consumption even though there is no increase in income; (2) the presence of new production goods in the economy, when household income remains, but if there are new goods, the household will be stimulated to increase its consumption; and (3) an increase in household welfare, this welfare can be seen from the availability of current assets, especially in the form of cash, deposits in banks and savings.

The findings from Koc & Ceylan(2012) found that households with lower status spend most of their income on food products. However, when wages increase, the level of spending on food products decreases proportionally and the ability to make savings increases. The highest status household always checks food product price tags with a high percentage (66.67 percent). More than half of households are relatively distrustful of all the information and ingredients of the product on the packaging. As many as 77 percent of households stated that they were open to trying new food products. Consumers in the top socio-economic groups are most careful about food ingredients. On the other side, the findings from Streeter(2017) show that first, consumption of animal foods, fresh fruit, and dairy products increases and cereals decrease in response to income growth. Households with low consumption levels are more responsive to changes in income. Second, better-educated people prefer a low-calorie diet with more animal foods, fruit, and milk but less cereal. Third, households in cities consume more animal food, fresh fruit, and dairy products, while households in rural areas consume more energy and carbohydrates. While Sánchez, Beriain, & Carr(2012) found that the evaluation of household behavior in consuming beef has a difference according to the level of product information provided, this finding estimates that the most socioeconomic factors that influence the behavior of households in consuming beef are gender, age, and education level. Furthermore, households that have a high income and education are more likely to consume beef.

## METHODOLOGY

The scope of this study is focused on the consumption of rural farmers in the center of South Sumatera. The survey region i.e. district of Ogan Komeringlilir (OKI), East OKU, and Banyuasin. The number of samples in the study was 300 rice farming households. The analytical method used a qualitative descriptive approach to investigate the proportion of food and non-food consumption, while the quantitative approach with a Polynomial regression model to investigate the socio-economic variables influencing household consumption of rural farmers in South Sumatera. The construction of econometric models in the study is based on the Keynes consumption model. According to Davis (2003) and Soebyakto & Bashir (2017), consumption expenditure carried out by the household sector in the economy depends on the amount of income. The comparison between the amount of consumption and the amount of income is called the consumption bias (MPC = Marginal Propensity to Consume). The greater the MPC the greater the income used for consumption activities and vice versa. The Keynes consumption function can be explained as follows:

$$C = f(Y) \quad (2)$$

The equation (1) which is then presented in equation (3) as follows:

$$C = C_0 + f_c(Y_d) \quad (3)$$

Where:  $C_0 > 0$  or  $C_0$  is subsidized consumption (the autonomous consumption) which is the amount of consumption received by consumers if their income does not exist or  $Y = 0$ ;  $f_c$  is marginal propensity to consume =  $\partial C / \partial y$ ; and  $Y_d$  is disposable income or income that is ready to be consumed or like the equation presented as follows:

$$Y_d = Y - T_x + T_r \quad (4)$$

Where:  $T_x$  is the value of tax charged; and  $T_r$  is the value of subsidies or transfers that have been received.

This study model adds social factors from the Keynes consumption function in equation (1) to the function in equation (5) which is presented as follows:

$$C = f(Y, Y^2, X, \dots, Z_n) \quad (5)$$

Hereinafter presented in a simple function in equation (6) as follows:

$$C_{ni} = f(INC_i, INC_i^2, FM_i, AGE_i, EDU_i) \quad (6)$$

Where:  $C$  is household consumption;  $Y$  is farmer household income; and  $X, \dots, Z_n$  is another socio variable. In equation (5) and (6), then construct the econometric model using the polynomial model in equations (7) and (8) by transforming the model in the form of the natural logarithm, the non-linear regression polynomial model is presented as follows:

$$\ln FC_i = \alpha_0 + \beta_1 \ln INC_i + \beta_2 \ln INC_i^2 + \beta_3 \ln FM_i + \beta_4 \ln AGE_i + \beta_5 \ln EDU_i + e_{1i} \quad (7)$$

$$\ln \text{NFC}_i = \alpha_0 + \beta_1 \ln \text{INC}_i + \beta_2 \ln \text{INC}_i^2 + \beta_3 \ln \text{FM}_i + \beta_4 \ln \text{AGE}_i + \beta_5 \ln \text{EDU}_i + e_{2i} \quad (8)$$

Where: FC is the proportion of food consumption (% per income); NFC is the proportion of non-food consumption (% per income); INC is farmer household income (IDR. per month); FM is the number of household members (person); AGE is the age of the household head (year); EDU is the education level variable (year).

The polynomial regression model matches using the least-squares method. The least-squares method minimizes the variance of an unbiased estimator of the coefficient, under the conditions of the Gauss-Markov theorem. The polynomial regression model plays an important role in the development of regression analysis, with greater emphasis on design and inference problems.

## RESULT AND DISCUSSION

### Socio-economic characteristic

In this section, we will explain a summary of the characteristics of farmer households in this study. The characteristics that will be explained include age, education level, number of household members, income, and profits obtained by the farmer's household as a whole.

**Table 2:** Summary of socio-economic characteristic

| Socio-economic factor             | n   | (%)   | mean         | min          | max          |
|-----------------------------------|-----|-------|--------------|--------------|--------------|
| <b>Age (year)</b>                 |     |       | <b>44.51</b> | <b>26.00</b> | <b>65.00</b> |
| 26-30                             | 24  | 8.00  |              |              |              |
| 31-35                             | 32  | 10.67 |              |              |              |
| 36-40                             | 87  | 29.00 |              |              |              |
| 41-45                             | 74  | 24.67 |              |              |              |
| 46-50                             | 58  | 19.33 |              |              |              |
| > 50                              | 25  | 8.33  |              |              |              |
| <b>Education level (year)</b>     |     |       | <b>9.70</b>  | <b>16.00</b> | <b>6.00</b>  |
| Primary                           | 85  | 28.33 |              |              |              |
| Junior high school                | 112 | 37.33 |              |              |              |
| Senior high school                | 75  | 25.00 |              |              |              |
| Bachelor                          | 28  | 9.33  |              |              |              |
| <b>Family members (person)</b>    |     |       | <b>3.38</b>  | <b>1.00</b>  | <b>7.00</b>  |
| 1-3 person                        | 146 | 48.67 |              |              |              |
| 4-6 person                        | 112 | 37.33 |              |              |              |
| >6 person                         | 42  | 14.00 |              |              |              |
| <b>Income level (IDR million)</b> |     |       | <b>6.50</b>  | <b>2.10</b>  | <b>8.00</b>  |
| 3.1 - 4.0                         | 34  | 11.33 |              |              |              |
| 4.1 - 5.0                         | 47  | 15.67 |              |              |              |
| 5.1 - 6.0                         | 73  | 24.33 |              |              |              |
| 6.1 - 7.0                         | 79  | 26.33 |              |              |              |
| 7.1 - 8.0                         | 67  | 22.33 |              |              |              |

**Source:** Author's calculation, 2018

When viewed based on the workforce, it means that individuals who have ages between 15-64 years, such as the information presented in Table 2 below, show that the age distribution of respondents mostly has ages between 36-40 years with a proportion of 29% of the total respondents, then followed by respondents who have ages between 41-45 years with a proportion of 24.67%. While the distribution of respondents who have more than one year of age is only 8.33%, on average the respondents in the study have 44 years of age, while the maximum and minimum age of respondents in this study is 65 years and 26 years old, indicating that most respondents in the study this is included in the workforce that has a productive age that is actively working.

The next social characteristic is the education level. Generally, education is an effort of individuals who actively develop their potential to gain personality abilities, intelligence in the academic field, and other skills needed as a provision in life. The education level of respondents in this study can be seen from the information presented in Table 2 when viewed based on the education level, the majority of respondents had the junior high school education level during 9 years. The distribution of respondents with the highest level of education is the junior high school with a proportion of 37.33%, then followed by respondents who have the primary school education level with a proportion of 28.33%. While respondents who had bachelor education were only 9.33%, most of the respondents who had an undergraduate education level were

educators, who were also farmers' households. Overall, this indicates that the majority of respondents in this study still had a low education level.

In addition, another social characteristic is the number of household members, which is measured by a large number of people in one place of residence. In Table 2, the information that we have obtained is that the majority of respondents have a household membership of 1-3 people with a proportion of 48.67%. On average, respondents have 3 household members, although some respondents have more than 6 household members. The number of household members is one of the factors that can affect the level of consumption and household income, so it can be said also that the number of household members is a measure to see the level of welfare of the farmer's household. Also, it can also affect the quality of the household both in the quality of education and health in each household member.

The study also revealed household economic factors such as income by farmer households in the three research areas. This income level is measured by the total income received by working household members. In general, household income consists of from production factors (such as wages and salaries, profits, bonuses, etc.), repayment of capital services (interest, profit sharing, etc.), and the income derived from giving another party (transfer). In Table 2, we present information about the distribution of household income, we find that on average the income of farmer households in this study area is IDR.6.5 million, for the maximum and minimum income received by farmer households is IDR.8.0 million and IDR.2.1 million. In proportion, the distribution of most farmer households has an income between IDR.6.0-7.0 million with a proportion of 26.33%, while the least distribution is household income between IDR.3.1-4.0 million with a proportion of 11.33% of the total sample in this study. This indicates that farm household income is still relatively low, the cause of the low caused by several factors such as limited land area, quality of seeds, fertilizer, and the use of conventional technology.

### Food Consumption Pattern

The comparison of food consumption patterns of rice farming in the study area, namely OKI, Banyuasin, and East OKU districts. Generally, consumption patterns are arrangements or patterns of household or individual consumption to meet their daily needs. The consumption pattern of each household has a difference because of several factors that cause it, such as income, age, education, number of family members and others. The food consumption pattern from the results of this study is summarized in the form of the proportion of expenditure from each food group by farmer households, in Table 3 below, shows the average expenditure for food needs according to the category of food needs in OKI, Banyuasin, and East OKU districts.

Table 3, it can be seen the difference in expenditure allocation and expenditure proportion for food needs in rice farming households. As can be seen that farming households in Banyuasin district have more expenditure on food consumption than district OKI and East OKU, namely the total expenditure value of IDR. 944,090 per month, then followed by rice farming households in East OKU and OKI district with the total expenditure value respectively of IDR.929,855 and IDR.922,253 per month.

**Table 3:** Proportion of average expenditures for food consumption

| Food consumption     | OKI            |               | Banyuasin      |               | East OKU       |               |
|----------------------|----------------|---------------|----------------|---------------|----------------|---------------|
|                      | Value (IDR)    | (%)           | Value (IDR)    | (%)           | Value (IDR)    | (%)           |
| Rice                 | 236,845        | 25.68         | 247,246        | 25.91         | 208,675        | 22.44         |
| Animal protein       | 226,488        | 24.56         | 276,010        | 28.93         | 263,330        | 28.32         |
| Vegetable protein    | 49,920         | 5.41          | 49,520         | 5.19          | 52,200         | 5.61          |
| Vegetables           | 124,620        | 13.51         | 64,870         | 6.80          | 53,130         | 5.71          |
| Fruits               | 55,060         | 5.97          | 47,605         | 4.99          | 45,580         | 4.90          |
| Oil & Fat            | 49,055         | 5.32          | 52,490         | 5.50          | 83,377         | 8.97          |
| Beverage ingredients | 67,350         | 7.30          | 55,180         | 5.78          | 53,114         | 5.71          |
| Spices               | 43,750         | 4.74          | 47,589         | 4.99          | 36,862         | 3.96          |
| Snacks               | 69,165         | 7.50          | 113,580        | 11.90         | 133,587        | 14.37         |
| <b>Total</b>         | <b>922,253</b> | <b>100.00</b> | <b>954,090</b> | <b>100.00</b> | <b>929,855</b> | <b>100.00</b> |

**Source:** Basic Data collected from Primary source, Author analyzed, 2018

Meanwhile, when viewed from the proportion of expenditure for the largest food needs is in the food group of the animal protein, rice, snacks, and vegetables for the three regions. In OKI district the proportion of the largest household needs is rice consumption with a proportion of 25.68%, then followed by consumption of animal protein by 24.56% and vegetable consumption by 13.51%. While the lowest proportion of consumption is in the consumption of spices which is equal to 4.74%, then the consumption of oil and fat is 5.32%. This indicates that the largest household food consumption expenditure in the OKI district is allocated to rice consumption, animal protein (such as meat, milk, eggs, and fish), and vegetables.



In contrast to the proportion of household needs of rice farmers in the Banyuasin district, the largest proportion is the consumption of animal protein which is equal to 28.93%, while the proportion of rice consumption is 25.91%, the consumption of snacks with a proportion of 11.90%. While the lowest proportion of food consumption is on the consumption of spices and fruits with a proportion respectively of 4.99%, then followed by the proportion of consumption of vegetable protein such as soy food and tofu. This indicates that the largest household food consumption expenditure in the Banyuasin district is allocated to rice consumption, animal protein (such as meat, milk, eggs, and fish), and snack consumption (fast food).

Likewise, with paddy farmer households in East OKU district, the largest proportion in food group consumption by farmer household in East OKU district is the animal protein with the proportion of 28.32%, then followed by the proportion of rice consumption of 22.44%, and the proportion of consumption of snacks with the proportion of 14.37%. Whereas for the lowest consumption proportion is the consumption of spices and fruits with the proportion respectively of 3.96% and 4.90%. This indicates that the largest household food consumption expenditure in East OKU district is allocated to rice consumption, animal protein (such as meat, milk, eggs, and fish), and snacks (fast food).

### Non-Food Consumption Pattern

In addition to food consumption patterns, this study also revealed non-food consumption in rice farming households in the study area. Generally, non-food consumption needs are greater than food consumption. Non-food consumption includes housing needs, clothing, telecommunications, various goods and services, health, education, transportation or fuel oil, household furniture, taxes (building land and motorized vehicle taxes), mandatory contribution (electricity and water), cooking fuel, tobacco/cigarettes, and other unexpected expenses. Non-food consumption patterns and the proportion of average expenditures by each household will be presented in Table 4.

The results of this study found that from each study area, the highest non-food consumption needs by rice farming households were housing consumption, clothing, education, transportation and consumption of tobacco or cigarettes. Meanwhile, when viewed from the lowest non-food consumption, that is tax contribution such as building land taxes, and motorized vehicle taxes, and the consumption of cooking fuels such as fuelwood and gas. This indicates that the expenditure allocation for these needs is paid once and the usage is fairly long.

When viewed from each proportion of non-food consumption expenditure, there are differences in the proportion of consumption in the three study areas. For the total non-food consumption of rice farming households in OKI district that is equal to IDR.3,013,982 per month, which is the highest non-food consumption, namely the need for housing, education, tobacco, and clothing, with the average proportion of expenditure each of 19.82%, 19.27%, 10.17%, and 12.39%. While for the lowest non-food consumption, namely the need for taxes (building land and motorized vehicle taxes) and cooking fuel, with the proportion respectively of 1.17% and 1.49%. This indicates that a portion of the income of rice farming households in OKI district is allocated to housing, education, tobacco or cigarette, and clothing needs.

**Table 4:** Proportion of average expenditures for non-food consumption

| Non-food consumption      | OKI              |            | Banyuasin        |            | East OKU         |            |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|
|                           | value (IDR)      | (%)        | value (IDR)      | (%)        | value (IDR)      | (%)        |
| Housing                   | 597,450          | 19.82      | 336,700          | 12.73      | 544,650          | 18.53      |
| Clothing                  | 373,500          | 12.39      | 334,900          | 12.66      | 383,100          | 3.04       |
| Telecommunication         | 97,900           | 3.25       | 161,300          | 6.10       | 84,600           | 2.88       |
| Various goods & services  | 146,098          | 4.85       | 335,050          | 12.66      | 106,344          | 3.62       |
| Health                    | 92,920           | 3.08       | 53,700           | 2.03       | 105,720          | 3.60       |
| Education                 | 580,800          | 19.27      | 523,200          | 19.78      | 589,600          | 20.06      |
| Transportation & fuel oil | 238,360          | 7.91       | 228,350          | 8.63       | 232,680          | 7.92       |
| Furniture                 | 93,010           | 3.09       | 68,850           | 2.60       | 95,420           | 3.25       |
| Tax expenditure           | 35,403           | 1.17       | 46,046           | 1.74       | 37,784           | 1.29       |
| Electricity & water       | 282,920          | 9.39       | 196,680          | 7.43       | 264,340          | 8.99       |
| Cooking fuel (gas & wood) | 45,025           | 1.49       | 46,325           | 1.75       | 51,010           | 1.74       |
| Tobacco or cigarettes     | 306,580          | 10.17      | 189,590          | 7.17       | 320,190          | 10.90      |
| Other expenditures        | 124,017          | 4.11       | 124,867          | 4.72       | 123,383          | 4.20       |
| <b>Total</b>              | <b>3,013,982</b> | <b>100</b> | <b>2,645,558</b> | <b>100</b> | <b>2,938,822</b> | <b>100</b> |

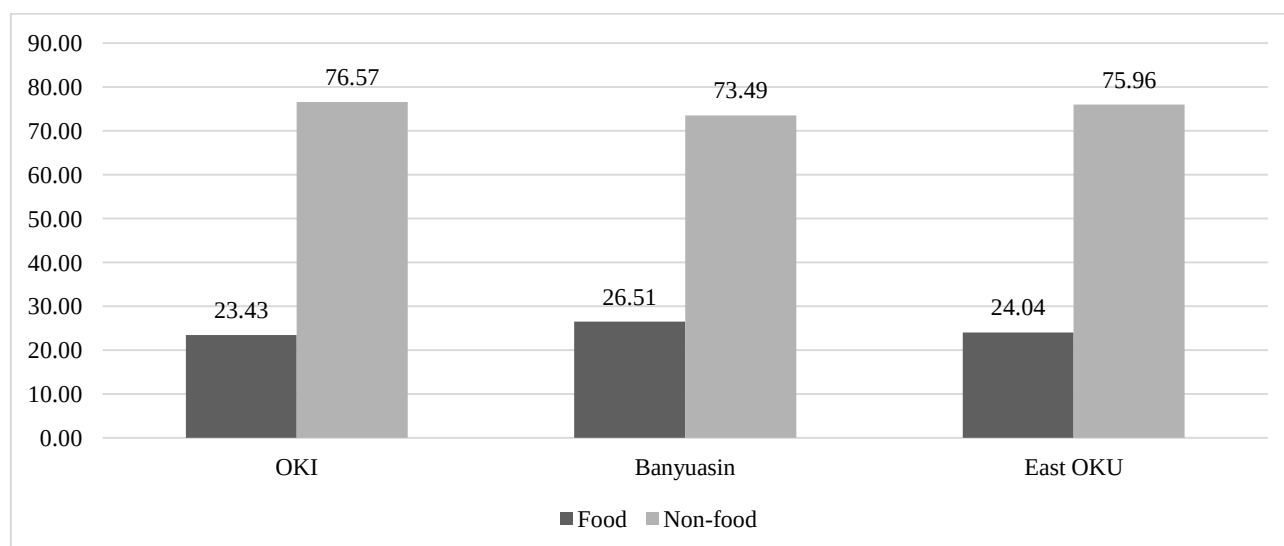
**Source:** Basic Data collected from Primary source, Author analyzed, 2018

Meanwhile, the total household non-food consumption expenditure in the Banyuasin district of IDR. 2,645,558 per month, this value is slightly lower than the non-food consumption expenditure of rice farming households in the Banyuasin district. When viewed from the calculation results, the highest proportion of household expenditure for non-food consumption in the Banyuasin district is for education, housing, clothing, and various goods and services, with the

proportion of 19.78%, 12.73%, 12.66%, and 12.66%. While the lowest expenditure proportion is for tax contributions (such as building land taxes, and motorized vehicle) and cooking fuel consumption, with the proportion respectively of 1.74% and 1.75%. This indicates that some of the household income of rice farming in the Banyuasin district is allocated to consume educational needs, housing, clothing, and various goods and services. This is in line with the results of observations in the field, most households allocate to the cost of education, because the distance is quite far, so that transportation costs are quite high.

In addition, for the total expenditure allocation for farming households for non-food consumption in East OKU district, that is IDR. 2,938,822 per month. Expenditure allocation based on the highest proportion of expenditure on farming households in East OKU district is for educational needs, housing, tobacco or cigarettes, and contribution (such as electricity and clean water), with the proportion of 20.06%, 18.53%, 10.90%, and 8.99%. While for the lowest proportion of expenditures for non-food consumption, namely for the needs of taxes (building land and motorized vehicle taxes) and cooking fuel, the proportion of each is 1.29% and 1.74%. This indicates that most of the household income of rice farming in the Banyuasin district is allocated to educational needs, housing, tobacco or cigarettes, and contribution premium (such as electricity and clean water).

Figure 1, shows that the proportion of household expenditure for food consumption is lower compared to non-food consumption, for all of the study areas. Like, the expenditure by rice farming households in OKI district, the proportion of expenditure by farming households for food consumption is only 23.43%, while for non-food consumption expenditures of 76.57%. This indicates that most of the income of farming households in OKI district is allocated more for non-food consumption needs, this is in line with the proportion for food consumption that has been stated in the previous description.



**Figure 1:** Comparison of Food and Non-Food Consumption Patterns

**Source:** Author's calculation, 2018

Likewise, the proportion of expenditure by farming households in Banyuasin district and East OKU, in aggregate, shows proportions that are almost the same. As in the Banyuasin district, the proportion of household expenditure for food consumption of 26.51%, while the proportion for non-food consumption of 73.49%. The same thing also happened to the proportion of expenditure by rice farming households in East OKU district, the proportion for food consumption of 24.04%, while the proportion of expenditure for non-food consumption reached 75.96%. The highest proportion of expenditure on non-food consumption compared to food consumption by farmer households indicates that the welfare level of farmer households is currently increasing and has been better.

### Estimation result of consumption model

Testing of classical assumptions on consumption models consists of multicollinearity and heteroscedasticity tests, from the test results providing information that Tolerance values have values smaller than 1 and VIF values smaller than 10, this means that there is no violation of the multicollinearity assumption in this research model. The heteroscedasticity test using the Glejser test is by estimating the independent variables on residual values, these results indicate that there is no significant effect on residual values, which means that there is a uniformity of variants from the residuals for all observations in the linear regression model, so the model can be declared valid in observation.

The summary results of the consumption model in Table 5 indicate that jointly variables socio-economic such as INC, FM, AGE, and EDU have a significant effect on farm household consumption, this is statistically proven by the obtained f-test value of 76.169 or with a value probability of 0.000. In addition, the value of R (correlation) is 0.751, which means that between the independent variables and the dependent variable which consists of variables INC, FM, AGE, and EDU has a

relationship of 75.1% on farmer household food consumption (FC). Then the value of  $R^2$  (coefficient of determination) has a value of 0.564, which means that the variation of the dependent variable can be explained by an independent variable of 56.4%, while 43.6% can be explained by other variables outside the study model.

In addition, the results of the consumption model estimation in Table 5, show a constant coefficient value of 3,984, it is assumed that if there is no change in the independent variable, then consumption will only increase by 3.98%, the high of constants value indicate that there are factors others outside the model which has greater than an influence on the consumption of farmer households.

Meanwhile, from the estimation of the consumption model, we also estimate the influence of partial socioeconomic factors on farm household consumption, from the fourth independent variables which have been estimated, indicated that the income variable has a positive sign and significant effect on farmer household consumption at the significance level 5%. Statistically, proven with the coefficient value of income variable of 0.596, which means that if there is an increase in income of 1%, then farmer household consumption will increase by 0.59%, assuming other factors do not change. Income is one of the important factors in fulfilling daily needs, not only the consumption of food but also non-food consumption. In consumption theory, the most important factor in influencing consumption is income as expressed by [Ismail et al. \(2014\)](#) and [Krueger & Perri \(2011\)](#).

**Table 5:** Estimation result of consumption model

| Variable           | Descriptions                     | Coefficient          |                      |
|--------------------|----------------------------------|----------------------|----------------------|
|                    |                                  | Model-1              | Model-2              |
| C                  | Constant                         | -2.561***<br>(1.071) | -4.615***<br>(1.344) |
| lnINC              | Household income                 | 2.811***<br>(1.105)  | 5.015***<br>(1.386)  |
| lnINC <sup>2</sup> | Household income squared         | -0.765***<br>(0.286) | -1.338***<br>(0.359) |
| lnFM               | Family members                   | 0.345***<br>(0.044)  | 0.306***<br>(0.055)  |
| lnAGE              | Age (household head)             | 0.583***<br>(2.180)  | -2.223<br>(2.736)    |
| lnEDU              | Education level (household head) | 0.068**<br>(0.035)   | -0.035<br>(0.044)    |
| Obs                |                                  | 300                  | 300                  |
| $R^2$              |                                  | 0.603                | 0.513                |
| Adj- $R^2$         |                                  | 0.595                | 0.503                |
| F-test             |                                  | 74.348               | 51.484               |

Note: \*\*\*10%, \*\*5% is significant level p-value

**Source:** Basic Data collected from Primary source, Author analyzed, 2018

Likewise, the variable of family members and education levels also has a positive sign and significant effect on farmer consumption households which have t-test values respectively of 7.887 and 2.013. Statistically, it is also proven by the family member coefficient value of 2,939, which means that every increase in the number of family members by 1 person, then farmer household consumption will increase by 2.94%, assuming other factors do not change. The results of this study are in line with the studies conducted by [Bick & Choi \(2013\)](#) and [Young & Hamdok \(1994\)](#).

Besides that, statistically, the education level variable is also proven with the coefficient value of 0.213, which means that if the education level increases by 1 level, then the farmer household consumption will increase by 0.213%, assuming other factors do not change. In the previous section, it was described that overall more than 90% of farmer households allocate the highest expenditure for education, this also indicates that the awareness level of farmer households that the education level is very important in shaping individual characteristics. To assess the relationship between education and the intake of various foods, as well as groups of foods, for women and men in different age groups has been done by [Worsley, Blaschea, Ball, & Crawford \(2004\)](#).

However, this is not the case with the age variable, the estimation results indicate that age has a negative sign and does an insignificant effect on farmer household consumption. Statistically proven by a probability value of 0.399 greater than 0.05. This indicates that at an older age, income is lower than expenditure, with the consequence of terminating consumption. Conversely, people in middle age save to be able to compensate for the loss of income in retirement, this indicates that income will shift from one period of the life cycle to the next ([Aigner-walder & Döring, 2012](#); [Dyran et al., 2009](#)). The structure of economic demographics is consequently seen as the main determinant of the level of personal savings, as shown empirically by [Modigliani & Cao \(2004\)](#).



This paper provides an exploration effort using household survey data on rural rice farmers, multiple regression analysis in rural farm household consumption models to investigate the influence of socio-economic variables in the farmer's household on household consumption. This model shows the possibility of the influence of socio-economic variables in increasing household consumption. In addition, the findings obtained that the socio-economic variables that affect the consumption of farmer households are household income, number of family members, and level of education. Our other finding is that food consumption is lower than non-food consumption, this also proves that the welfare level of rural farmers is getting better ([Kumar et al., 2017](#); and [Rizov, Cupak, & Pokrivcak, 2015](#)).

The increase in non-food consumption is dominated by housing, education, and clothing. While food consumption is generally dominated by the consumption of rice, animal protein, and vegetables. These results indicate that the structure of consumption expenditure of rural farmers has undergone a transformation following household consumption in urban areas. The results of the optimization problem confirm the hypothesis of heterogeneity in the consumption function that can depend on household income, family members, and education level of household head, as assumed by ([Du et al., 2015](#); [Grünberger, 2014](#); [Musyoka, Kavoi, & Omiti, 2014](#)). In addition, the analysis confirms the findings of [Ismail et al. \(2014\)](#); [Bick & Choi\(2013\)](#) and [Krueger & Perri \(2011\)](#) regarding the consumption pattern of farmer households. In this way, by considering spatially heterogeneous consumption in various regions.

The choice of modeling used in this study reflects a number of reasonable assumptions, remains somewhat simplified and can be improved in further research. The main weakness of this approach lies in socio-economic variables. In addition, the process model does not discuss the factors of price increases (inflation), the balance of food balance, and the adequacy of the calories of farmer households. Therefore, this model can still be improved for several other reasons, especially given the complexity of the factors that affect the consumption of rural farmer households. However, the results confirm that the consumption patterns of rural farmer households have undergone a transformation to resemble the needs of urban consumption patterns. This study highlights the importance of using information about household consumption patterns to understand the determinants of rural household consumption.

## CONCLUSIONS

Conclusions from the results of this study, we found that the consumption pattern of farm households based on the proportion of food consumption with the highest consumption is rice, animal protein, vegetable protein, and vegetables at the study region. Meanwhile, the pattern of household consumption for non-food indicates that the highest consumption proportion for educational needs, housing, and tobacco or cigarettes is a dominant requirement compared to other needs. Totally, the proportion of household consumption expenditure of highest for food is farm households in Banyuasin district, then followed by East OKU and OKI districts. Conversely, the highest proportion of household consumption for non-food expenditure is households in OKI district, then followed by East OKU and Banyuasin district.

The result of this study, we found that from the fourth independent variables which have been estimated, there are three independent variables that have a significant effect on farmer household consumption such as income, family member, and education level. However, this is not the case with the age variable, the estimation results indicate that age has a negative sign and does an insignificant effect on farmer household consumption. This indicates that at an older age, income is lower than expenditure, with the consequence of terminating consumption. Conversely, people in middle age save to be able to compensate for the loss of income in retirement, this indicates that income will shift from one period of the life cycle to the next ([Aigner-walder & Döring, 2012](#); [Dyner et al., 2009](#)). The structure of economic demographics is consequently seen as the main determinant of the level of personal savings, as shown empirically by [Modigliani & Cao \(2004\)](#).

## LIMITATION AND STUDY FORWARD

Attention to the consumption of nutritious food at this time is very important. Therefore, the study forward carries out mitigation by making action plans to encourage food diversification in each region because this is important to overcome food insecurity and malnutrition in the regions.

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## AUTHOR CONTRIBUTION

Taufiq Marwa is the main researcher. He contributes to generating research ideas, writing the proposal and writing the research report and paper draft. Abdul Bashir is co-researcher, he contributes to writing discussion of the paper draft and corresponding with journal editors. Azwardi is co-researcher, he is responsible for writing questionnaires and collecting data. He contributes to writing discussion of the draft of the paper. K. M. Husni Thamrin is co-researchers well; he is responsible for data analysis and translating paper from the Indonesian language into English. Imam Asngari is co-researchers and responsible in paper editing, he is also responsible for correcting the paper.

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