



Rice Consumption Pattern of Rural Households in East OKU and South OKU Regencies South Sumatra Province Indonesia

Imam Asngari^{1*}, Suhel Suhel¹, Abdul Bashir¹, Andi Nurul A. Arief², Era Susanti³

¹Department of Development Economics, Faculty of Economics, Universitas Sriwijaya, Palembang, Indonesia, ²Student at Magister of Economics, Faculty of Economics, Universitas Sriwijaya, Palembang, Indonesia, ³Department of Development Economics (Alumny), Faculty of Economics, Universitas Sriwijaya, Indonesia. *Email: imam.asngari@unsri.ac.id

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ABSTRACT

This study is to examine the pattern of rice consumption of rural households case study in East OKU Regency and South OKU Regency, South Sumatra Province Indonesia. South OKU Regency is a paddy production center, and South OKU Regency is a coffee plantation center, not a rice producer. This study is field research by using household expenditure of 200 head of the family collected by using questionnaires. Method of analyzing rice food consumption by using descriptive quantitative approaches and multiple logistic regression models. The results show that rural household spending was dominated by proportional rice food consumption. Household rice food consumption has significantly influenced the price of wheat, family income, and the number of family members. Factors the price of rice, working times, and total assets have different significance on influence rice consumption in East OKU and South OKU.

Keywords: Household Rice Consumption, Food Price, Income, Work Hour, Numbers of Family

JEL Classifications: D11, D12, D16, Q18, R22

1. INTRODUCTION

Rice is a basic and strategic need for most people in Indonesia, so the availability of rice food in South Sumatra must be always guaranteed (Adam et al., 2017). Humans with all their abilities always try to meet their needs with a variety of businesses. First, business by utilizing nature as it is (natural) by planting various food plants. Second, modify nature using technology to meet food production according to their needs. Fulfillment of food needs is an obligation of the government and the community together as stated by law concerning food (Law Number 18 of 2012). The law states that food is the most important basic human need and its fulfillment is part of human rights, the state is also obliged to realize the availability, affordability, and fulfillment of consumption (Ministry of Agriculture, 2017).

Based on the level of welfare of the Indonesian people as measured by the share of food expenditure, both in urban and rural areas is

getting better. There is a change in the pattern of public expenditure from dominant in the grains group to the food and beverage group (Central Bureau Statistic, 2014). While spending patterns for other food groups are relatively the same from year to year (Ministry of Trade, 2013).

The issue of the world food crisis is closely related to the issue of global climate changes (FAO, 2010). The economic crisis of developed countries since 2008 still leaves a weakening of their purchasing power of agricultural products and industrial raw materials (Ejeta, 2009). Weakening purchasing power of developed countries has affected the plummet of world primary commodities including food commodities from 2008 to 2016. The dynamics of the global economy have driven volatility in food and energy prices (Ministry of Agriculture, 2016). The impact of the decline in prices of primary agricultural commodities on world markets since the 2008 global crisis has been the decline in the welfare of rural populations.

Table 1 confirms that the percentage of the population of the rich has decreased, shifted to the middle class, and from the lower middle class to the poor (using monthly per capita income of less than Rp. 365,000). Expenditures per capita of the population in East OKU Regency are concentrated in the expenditure intervals of Rp. 750,000 to Rp. 1,499,999 per month around 44.73% (2016), and decreased to around 41.90% (2017). Whereas in South OKU, the majority of monthly household expenditure at intervals of Rp. 300,000 to Rp. 749,999 was 60.34% (2016) and slightly decreased to around 49.93% (Central Bureau of Statistic, 2018). This decline in expenditure groups occurred because part of the community's income was reduced, as indicated by the increase in the population whose per capita spending was less than Rp. 500,000 in East OKU from 8.65%, up to 9.09% (Central Bureau of Statistic, 2018). Likewise in South OKU, the number of residents whose expenditure is below the interval of Rp. 300,000 per month increased from 15.44% (2016) to around 27.49% (2017).

Table 1: Percentage of population by expenditure groups per capita for a month in East OKU regency and South OKU Regency

Expenditure class (in Rupiah)	Population in East OKU (%)		Population in South OKU (%)	
	2016	2017	2016	2017
<150,000	0.00	0.00	0.00	0.78
150,000-199,999	0.00	4.92	0.00	4.88
200,000-299,999	0.00	0.00	15.44	22.61
300,000-499,999	8.65	9.09	41.48	30.24
500,000-749,999	11.99	12.35	19.86	19.69
750,000-999,999	20.84	18.21	11.71	8.41
1,000,000-1,499,999	23.99	23.69	7.69	6.59
>1,500,000	34.53	31.74	3.82	6.79
Jumlah/Total	100.00	100.00	100.00	100.00

Source: Central Bureau of Statistics, 2018

Table 2: Average expenditure on food consumption in East OKU and South OKU Regencies

Food group	Average spending per a month's capita (Rp)			
	East OKU		South OKU	
	2016	2017	2016	2017
Grains	61,614	58,971	76,435	54,153
Tubers	2493	2460	2434	3380
Fish, Shrimp, Squid, Mussels	30174	38163	27925	29942
Meat	13.699	10472	10215	15423
Eggs and Milk	21672	25784	17766	21050
Vegetables	41676	36644	40880	44828
Nuts	12412	13325	8052	7208
Fruits	13690	17978	10342	8031
Oil and Fat	13986	13306	10802	9401
Beverage ingredients	15773	15757	20859	18616
Spices	10273	8772	9246	8031
Other consumption	7638	8553	8627	9622
Food and Beverage	84266	71055	45236	60690
Tobacco and Betel	65784	61043	77140	59060
Total	395150	382283	365959	349435

Source: Central Bureau of Statistics, 2018

Based on the data Table 2 from the Central Bureau Statistics (2018), the average growth in spending on household food consumption in 2017 decreased by 0.05%. The highest expenditure growth for food consumption was dominated by four food groups such as meat, tubers, processed food, and beverages, tobacco, and betel which grew around 0.23-0.5%. However, in 2017 was food groups, that had to grow negatively such as grains, nuts, fruits, oils and fats, beverage ingredients, and spices with an average decline of 0.16%. If the proportion of expenditure for the food group is calculated, the highest is dominated by grains (rice) by 15.6% in East OKU and 12.9% in South OKU. Furthermore, the proportion of processed food and beverages is around 10.06-18.6%, tobacco and betel leaves around 9.79% to 15.97%, and vegetables around 7.43% to 9.59% (Table 2).

The data in Table 2 can also provide information on the proportion of household expenditure per capita for each food group per month in the regency of East OKU and South OKU. The development of expenditure for food consumption has changed during 2016-2017, the change can be caused by rising food prices and household income, as well as the current pattern of household consumption that is changing. An interesting phenomenon shows that the proportion of consumption for grains is now smaller than the consumption of the food and beverage group, and the tobacco and betel groups, this indicates that households have reduced the demand for food consumption with more practical consumption of food and beverages. The phenomenon of the decline in the proportion of household spending on food such as grains also occurs in other provinces such as in East Java (Mayasari et al., 2018), which indicates an increase in prosperity in the region.

Therefore, what is interesting to study now is that investigating the response of households to rising food prices will provide policy advice to the government. The government can implement subsidized input prices and appropriate food prices. This study will also provide information about trends in changes in food consumption over time and become a guide for the development of food diversification in the future (Ariani and Purwati, 2015; Rizov et al., 2015).

Rice food is a food commodity produced from processed agricultural products, namely rice. East OKU Regency is a rice production center and rice producer in South Sumatra (Asngari and Sudiro, 2010), while South OKU Regency is a coffee plantation producer. Nevertheless, the position of rice commodity for most of the population in the two regencies is the main food ingredient besides being an important source of nutrition in the food structure (Firdaus and Cahyono, 2017; Kumar et al., 2017), so that the aspect of rice supply becomes very important considering the population in the province of South Sumatra is getting bigger.

The pattern of rice food consumption for rural households is interesting to study more deeply in order to obtain information on the response of household rice food demand to changes in income, food prices, a number of family members, hours worked and the number of assets. If household income does not change, while the price of rice food rises, households will respond by reducing the

demand for rice food and or replacing it with cheaper rice food such as low-quality rice or for some residents whose income level is low will turn to consumption other foods such as *oyek* or *tiwul* which are made from cassava. The response of households to the increase in rice food prices can be a guide for the government to implement rice food price policies, as well as adequate stock policies to anticipate trends in changes in rice food consumption over time and as a guide for the development of food diversification in the future (Faharuddin et al., 2015). Therefore, the role of the rice market policy will guarantee food security (Azwardi et al., 2016; Adam et al., 2017).

2. LITERATURE REVIEW

Demand is the desire of consumers to buy an item at various price levels over a certain period in a certain geographical area. The demand for an item is influenced by several factors such as (Pindyck and Rubinfeld, 2013): (a) The price of the it own good and services, (b) the price of other related goods, (c) the level of income per capita, (d) taste or habits, (e) total population. The demand for rice is determined, *ceteris paribus*, by factors such as own price, consumer income, population, gender, age, and the price of a substitute good (Kouekam et al., 2018).

Demand for goods is determined by the price of the goods themselves, while other factors are considered constant unchanged (*Cateris Paribus*). The lower the price, the higher the demand, conversely the higher the price, the demand will decrease. The demand function is a request expressed in a mathematical relationship with the factors that influence it. Consumption demand is determined by the same variables as the variables in demand theory, namely prices, income, prices of other goods, population, and other factors that can affect consumption patterns. Function consumption demand is designed to determine the relationship between dependent variables and independent variables.

Suryani et al. (2009) conducted an exploratory study on the current conditions of consumption and food expenditure in Singapore with implications for Malaysia as an important agricultural exporting country to Singapore. This research shows that Singapore consumers are likely to demand high-quality poultry, pork, seafood, vegetables and fruits in the future, especially in response to revenue growth. Meanwhile, Malaysia appears to be rich in the production of these food commodities and is committed to exports due to oversupply. When facing competition from various countries, Malaysia still has various competitive advantages compared to other countries.

Fransiska (2013) analyzed the diversification of rice and non-rice food consumption, it was found that the number of household members had a significant and positive effect on household food consumption. This is also supported by the results of research conducted by Bangun (2014) showing that income and the number of family members have a significant effect on the level of rice consumption where the higher the income and the more family members the more rice consumed.

According to Husaini (1989) in the study of Ampera et al. a person's or family's food consumption behavior is influenced by the level of education or knowledge about the food itself, in one family usually the mother is responsible for family food.

The pattern of consumption of food rice in South Ogan Komerung Ulu was examined by Hernanda (2016) conducted in Sukamarga Village, Buay Pematang Ribu (BPR) central of Ranau district. Rice consumption is influenced by income, production, and area of paddy fields, number of family members, length of husband's education and household expenses.

3. RESEARCH METHOD

The scope of this study is focused on household rice food consumption in rural in the East Ogan Komerung Ulu Regency and South OKU Regency. The study was conducted from October to December 2018. Field data was taken from rural households in four villages namely Sriwangi Village and Sumber Jaya in East OKU Regency, and Rantau Panjang and Banding Agung Villages in South OKU Regency. Each village was taken a sample of 50 households, so the total sample of this study was 200 households. The analytical method used is a qualitative descriptive approach to investigate the proportion of rice food consumption, while the quantitative approach with multiple regression models (Gujarati, 2004) to investigate the factors that influence household rice food consumption patterns in rural in the East OKU and South OKU Regencies.

The consumption pattern will be calculated in two ways. First, the proportion of household expenditure for rice and non-rice food to the total food expenditure and the total household expenditure in a month. Second, the pattern of rice food consumption expenditure is estimated from the logistic multiple regression model as follows;

$$LNQ_{DB} = \sigma + \beta_1 LNP_B + \beta_2 LNP_G + \beta_3 LNY + \beta_4 LNTW + \beta_5 LNPOP + \beta_6 LNASSET + e_1$$

Explanation:

LNQ_{DB} = Rice food consumption expenditure (Rp)

σ = Constant

e_1 = Error of regression

β_1, \dots, β_6 = Regression coefficient of each variable

LNP_B = Lon rice price (Rp/kg)

LNP_G = Lon wheat price (Rp/kg)

$LNTW$ = Lon working time (hours)

$LNPOP$ = Lon number of family members (Person)

$LNASSET$ = Lon asset (Rp)

4. RESULTS AND DISCUSSIONS

4.1. Porportion of Food Expenditure

Based on Table 3 on the distribution of food expenditure in the two regencies, it was found that the community tends to consume rice every month, with the remaining 24-26% for other commodities. Based on a sample of 100 households in East OKU Regency, it is known that the allocation of household expenditure for rice is 27.80%, for fish consumption 13.37%,

vegetables by 8%, chicken meat 7.7%, and 6, 3% for beef. In contrast to expenditures 100 households in South OKU Regency which is allocated for rice consumption by 20.63%, for fish by 16.65%, chicken meat by 10.86%, vegetables by 9.15% and beef 5.66%.

The priority of community consumption in the two main regencies is for rice and fish, which is different in the third priority, if in East OKU the preference is for vegetables, while in South OKU it is more for chicken meat consumption. A fish product such as rice fields, swamps, and rivers that flow every day. The next food consumption which is relatively equally desirable is milk around 4%, tofu, and tempeh around 3.6% to 4.6% where East OKU is slightly higher than South OKU.

4.2. Determinants of Rice Food Consumption

The demand for rice in East OKU is significantly influenced by the price of rice, the level of income, and the number of family members at $\alpha = 1\%$ level. Other food commodities, which are proxy for wheat prices, are significant at $\alpha = 5\%$. While the length of work hours and the number of assets does not significantly affect rice consumption.

The deterministic coefficient (R^2) value is 0.7197, it means that the independent variable variation can explain the variation of rice demand in East OKU by 71.97% and the rest is explained by other independent variables outside the model. Based on the OLS assumption test, the rice consumption model has fulfilled all classical assumptions, namely, there is no problem with autocorrelation, homoscedasticity, and no multicollinearity. Based on the value of F-statistics = 26.10 with Prob F = 0.0000 it means that all independent variables in the model have a significant effect on the level $\alpha = 1\%$ (Table 4).

The value of the rice demand constant in East OKU is Ln (-9.433077) or Rp. 800.3 if other variables are constant or zero. This constant figure is statistically significant. Variable prices have a positive elasticity to the demand for rice of 1.27, meaning that changes in prices continue to encourage increased consumption of rice.

Wheat food prices have a positive and statistically significant effect, where the elasticity coefficient is 0.24890. Every time the price of wheat increases, the demand for rice will increase by 1.2826. The average price of wheat is Rp. 7,691 per kg. If there is an increase in wheat price by an average of Rp. 1,000 a month it will reduce the demand for wheat, and will replace it by increasing the demand for rice by Rp. 1,2826 per month. The average rice price in East OKU Regency is Rp. 9,860 per kg, so an increase in the wheat price of Rp. 1,000 per/kg will increase rice demand by 0.13 kg/month.

The income variable has a significant and elastic effect on rice demand with an elasticity coefficient of 0.507758. The average income is Rp. 3,251,127, with the income elasticity the change in demand for rice is Rp. 1,662. If the average income rises by Rp. 1000 per month, rice consumption in East OKU will increase by Rp. 1,662 per month. Based on Table 3, the proportion of

Table 3: Distribution of primary food consumption expenditures in the rural of East OKU and South OKU Regencies

Commodity	East OKU		South OKU	
	Value (Rp)	Percent	Value (Rp)	Percent
Rice	25,967,950	27.80	26,818,000	20.63
Wheat	1,207,177	1.29	1,118,678	0.86
Fish	12,487,000	13.37	21,642,250	16.65
Beef	5,902,500	6.32	7,352,500	5.66
Chicken meat	7,266,250	7.78	14,117,000	10.86
Egg	3,087,177	3.30	6,089,000	4.68
Vegetable oil	5,264,000	5.63	5,597,516	4.31
Sugar	3,285,534	3.52	3,814,761	2.93
Red Chili pepper	3,788,250	4.06	6,747,250	5.19
Cayenne pepper	2,863,500	3.07	3,488,500	2.68
Salt	495,072	0.53	697	0.00
Instant noodles	2,501,500	2.68	2,839,000	2.18
Milk	4,082,484	4.37	5,728,000	4.41
Tofu and Tempe	4,306,000	4.61	4,498,500	3.46
Meatball/Bakso	2,588,991	2.77	4,693,000	3.61
Coffe	1,321	0.00	3,573,000	2.75
Tea	604	0.00	558	0.00
Vegetables	8,323,000	8.91	11,897,000	9.15
Amount	93,418,310	100.00	130,015,210	100

Source: Field Research (processed by authors), 2018

Table 4: Determinants of demand for rice consumption in East OKU Regency

Variable	Dependent: Demand rice consumption (LnQDB)		
	East OKU		
	Cofisien	t-statistic	Prob.
Consnt	-9.433077	-2.584050	0.0211
LnPB	1.271834	3.218236	0.0021
LnPGD	0.248901	2.336100	0.0228
LnY	0.507758	7.671748	0.0000
LnTW	0.032922	0.401944	0.4573
LnPOP	0.658772	6.660809	0.0000
LnAsset	-0.035863	-0.920650	0.1317
R-squared = 0.719738			
F-statistik = 26.10888, Prob. F = 0.0000			
Durbin-Watson stat. = 1.367			

Source: Field Research (calculated by authors), 2018

rice expenditure in East OKU is 27.8%, the average value of household expenditure for rice consumption is Rp. 903,813 per month.

A long time of working time per month is an average of 223 h or the equivalent of 55.75 h a month per person. High working hours have no real effect on rice consumption. This is due to the location of work generally near the place of residence, so there is no kitchen in the location they work. Rural communities in East OKU do not consume rice at rest, but they usually consume instant noodles or cakes made from wheat. Both types of consumption are higher than South OKU Regency (Table 2).

The number of family members is inelastic at 0.658 and its effect on rice consumption is significant at $\alpha = 1\%$. The average family member is 4 people, meaning each additional 1 person, with the price of rice Rp. 9860, each additional 1 family member will increase the demand for rice by 7.8 kg/month. This amount is

Table 5: Determinants of demand for rice consumption in South OKU Regency

Variable	Demand rice consumption (LnQDB)		
	South OKU		
	Cofisien	t-statistic	Prob.
Consnt	-2.5565	-0.4597	0.6468
LnPB	0.7747	1.2859	0.2017
LnPGD	0.0233	2.0344	0.0448
LnY	0.2387	3.4465	0.0009
LnTW	0.3899	2.4813	0.0149
LnPOP	0.4540	4.7266	0.0000
LnAsset	0.0743	1.7126	0.0901
R-squared = 0.4163			
F-statistik = 11.05, Prob. F = 0.0000			
Durbin-Watson stat. =2.170			

Source: Field Research (calculated by authors), 2018

higher than the average rice consumption in Indonesia, at 6.8 kg per capita per month (BPS, 2017).

The total value of assets has an elasticity of -0.035 and is not significant, meaning that the consumption of rice in East OKU Regency is not influenced by family assets. This is different from South OKU because East OKU is the center of rice production.

The deterministic coefficient (R^2) value is 0.4163 (Table 5). It means that the variation of the independent variable can explain the variation of rice demand in East OKU by 42% and the rest is explained by other independent variables outside the model. Based on the classic assumption test has fulfilled all OLS assumptions, namely, there is no autocorrelation problem, homos prevalence, and no multicollinearity. Based on the F test the calculated F value = 11,737 with Prob F = 0.0000 means that all independent variables in the model have a significant effect on the level of $\alpha = 1\%$. Based on the classical assumption test, the demand regression model in Berasi Timur OK also fulfills all OLS assumptions. Then we can interpret the coefficient and the value of the statistical test.

The constant model of rice demand in South OKU is $\ln(-2.5565)$ or Rp. 0.0776. Even if other variables are constant or zero, then the community still consumes rice with autonomous consumption of Rp. 0.0776. This constant is not statistically significant. The rice price variable is not significant but has a positive elasticity of 0.77. Meaning that changes in rice prices do not cause changes in rice consumption. The price of rice is neutral. Because rice is a normal item. South OKU Regency produces coffee and the price of rice does not significantly affect rice consumption. The people there will buy rice even though the price of rice is an average of Rp. 10,057 per kg or higher compared to the East OKU region as a rice producer.

Wheat food price has a positive elasticity of 0.0232 and has a significant effect on rice demand at $\alpha = 5\%$, with a coefficient of 1.023. That is, wheat becomes a food substitute for rice. Wheat consumption per family is 2.51 kg/month, with an average wheat price of Rp. 2,250 per kg. If the price of wheat rises by Rp. 1,000 per kg to Rp. 8,250 per kg, the demand for wheat will decrease, and demand for rice will increase by Rp. 1,023. The average rice food consumption in the South OKU Regency of Rp. 268,180 or 26.67 kg will increase by 2.72 kg to 29.39 kg. As a

result of the increase in wheat prices the value of rice consumption to Rp. 295,575.

The income variables have inelastic and significant coefficients for rice demand. with the number 0.2386. The average income of Rp. 3,251,127. The income elasticity will drive changes in rice consumption by Rp. 1.2694. That means. If an increase in an average income of Rp. 100,000 will affect the increase in demand for rice by Rp. 126,947 per month and in South OKU Regency rice consumption will reach Rp. 26,818,000 or an average Rp. 268,180 per month will increase to Rp. 395,127 per month. The increase in income caused rice consumption per capita to rise from 6.69 kg to 7.72 kg/month.

The length of work time at South OKU has a significant influence on rice food demand. Working hours have a coefficient of 0.3899 which means an additional 1 working hour will increase rice consumption by 0.3899. The average work hours are 223 h a month, meaning that the coefficient of work time elasticity is 0.3899 which means there is an additional consumption equivalent to Rp. 1,477 per hour or around 0.0015 kg/h. This means that if each family has an additional 10 h of work a month, the demand for rice food per family in 1 month will increase by Rp. 14.77. This means, assuming 100 families have an additional 1000 h of work, it can increase rice consumption by 1.5 kg. Increased rice consumption in line with the duration of work occurs because some respondents of the South OKU Regency are working in gardens that are located more than 1 km to 10 km from the house. This causes farmers to generally build huts and cook food, especially rice and side dishes while in the garden.

The number of family members has an inelastic and significant influence on the level of $\alpha = 1\%$ with an escalating rate of 0.4540. Meaning each additional 1 family member will increase the increase in demand per capita of rice by Rp. 1,575 or 0.0015 kg/month.

Assets have different effects in East OKU Regency and South OKU Regency. The value of assets is significant at $\alpha = 10\%$ and influences the demand for rice in South OKU. The higher the value of assets will encourage the increase in rice consumption. Relatively wealthy residents are more able to hold social activities (parties) compared to poor groups.

5. CONCLUSIONS

The conclusion from the results of this study, found that the price of wheat, income, working hours and the number of family members each had a positive and significant effect on the consumption patterns of rice food demand in the two regencies. While rice prices have a significant effect on rice consumption in eastern OKU but not significantly in South OKU Regency. Working hours and assets are not significant in East OKU Regency, but have a significant effect on rice consumption in South OKU Regency.

Factors affecting rice demand in East OKU Regency are the price of rice, the price of wheat, the level of income and the number of family members. Length of work and the value of assets does not

affect the consumption of rice. Whereas the demand for rice in South OKU Regency is influenced by the price of wheat, income level, duration of work, number of family members, and value of assets. The duration of work has an affects consumption because in South OKU the generally works in a garden which is relatively far from their home and makes a cottage for cooking. While in East OKU it is relatively close to <0.5 km and is not used to cooking in rice fields.

The proportion of expenditure on rice food consumption to total food in East OKU is 27.80%. As for total expenditure, rice food expenditure is only around 12%. Whereas in South OKU the allocation of rice expenditure was 20.63% of the total food expenditure, and from household expenditure as a whole it was only around 5%. The proportion of rice expenditure in South OKU is lower because for the same rice the price in South OKU is higher than the price of rice in East OKU. The price of rice consumed in East OKU averages Rp. 9,860 per kg, while in South OKU it averages Rp. 10,057 per kg. Rice consumption per household in a month in East OKU is around 26.34 kg, while in South OKU it is around 26.67 kg.

Based on consumption patterns and factors affecting rice food demand. Then it should be a concern of the government that the price of rice is not always the same effect on rural areas. If in East OKU as a rice producer, then the price of rice will be responded to by households by choosing cheaper rice and selling better quality rice. Whereas in South OKU, prices do not significantly affect demand for rice, because the choice of rice quality is not as much as in East OKU. Even though the village community tends to choose quality III rice. but in South OKU the price does not affect the demand for rice. Regardless of the price of rice will still be bought by people who generally work on plantations. There is a difference in the price of rice per kg of the same quality of rice, where the price of rice in South OKU is slightly higher at around Rp. 400 per kg.

Income has a significant influence on rice consumption, so that food consumption is maintained, the government must provide policies that can support the level of rice prices of farmers not to fall so that the added value generated is high (Asngari and Sudiro, 2010). The high value-added of rice increases their income so that they especially farmers are still able to buy rice food.

The population has a significant effect on rice consumption, and the more the population increases the greater the level of consumption. Food security policies should keep population growth below the rate of food productivity.

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