

2013

# PROCEEDINGS

## International Seminar on Climate Change & Food Security

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asus

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## Rice Consumption Analysis for Different Income Groups in Palembang, Indonesia

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**Abstract.** As a staple food, rice is the most basic consumption needs of the population of Indonesia. Rice commodities viewed as a strategic commodity because it involves various aspects of national life, where the availability, distribution and price levels are very influential on the national stability. The purpose of this study were 1) to analyze the factors that influence the consumption of rice by population with different income groups at Palembang, South Sumatra Province, 2) to analyze the consumption of rice by households in Palembang, South Sumatra Province. The research was conducted in the city of Palembang, which consists of three sub-district; Pakjo, Sako, and Pulokerto. The data collected consists of primary and secondary data. Sampling method applied was simple random sampling. The results showed that the factors prices, the price of substitutes, income, family size, age, gender, and occupation are factors those significantly affect on the rice consumption. No statistically significant effect of the levels of education on the rice consumption. The result also showed that the consumption in high-income households lower than medium and low incomes.

**Keywords:** Rice, Household, Income, Consumption

### 1. Introduction

Rice is the staple food in Indonesia. With a population of 230 million and the population growth rate of 1.4% per year, the supply of rice at this time has reached its lowest level in over a period of 30 years which is accompanied by a rise in rice prices in the last 10 years. This means that Indonesia, just like other Asian countries, facing problems in securing the supply of rice to peoples (Tsubaki, 2010). To achieve sustainable food consumption required physical and economic accessibility to food. Accessibility is reflected in the number and type of food consumed by households. Thus, food consumption data in real terms can demonstrate the ability of households to access food and describe the level of household food security. Implicitly, the development level of food consumption also reflects the level of income or purchasing power of food. In addition, consumption patterns are often used as an indicator to measure the level of social welfare. In case of low-income population generally most of the income used are to meet food needs, while the higher income the lower percentage of their income to meet the food needs [7].

Palembang is a rice deficit area, due to its dominant population are livelihood rather than as a rice farmer, so the city of Palembang is the biggest rice consumers in South Sumatera Province. As the capital of South Sumatra Province Palembang is an area that has a high population heterogeneity that can be distinguished based on ethnic origin or based on income levels that can be seen from their jobs. The purpose of this study are:

1. To analyze the factors that influenced the consumption of staple rice in Palembang.
2. To analyze food staple rice consumption per capita in Palembang households which has different income groups in the city of Palembang in South Sumatra Province.

### 2. Methodology

Samples was taken by using a simple random sampling to represent the three categories of areas, i.e. areas which are high income population, areas with moderate income population and areas with low-income population. There were 20 samples taken for each group, so the number of samples were 60. The first research goal addressed by using statistical analytical tools. Estimator model calculations methode formulated by using a simple least squares (*OLS = Ordinary Least Square Method*). Independent variables

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were analyzed as a descriptive (*explanatory variables*), the diversity of domestic rice consumption is income (Inc), the number of members in the household (JAK), sex composition (Jk), age composition (U), the price of rice (Hb), the price of substitute goods (Hs), and level of education (PDK). Mathematically so that the estimator equations can be formulated as follows:

$$CBR = \alpha \cdot Inc^{\beta 1} \cdot JAK^{\beta 2} \cdot Hb^{\beta 3} \cdot Hs^{\beta 4} \cdot U^{\beta 5 D1} \cdot Jk^{\beta 6 D2} \cdot Pdkn^{\beta 7 D3} \cdot E^{\mu}$$

Where:

CBR = household consumption of rice in Palembang (kg / kk / yr)

Pd = Revenue (Rp / kk / Year)

JAK = Number of household members (org)

Hb = The price of rice (USD / kg)

Hs = The price substitution items (Rp / wrap)

D1 = dummy variable for age composition of household members

0= if <50% of household members aged unproductive

1= if ≥ 50% of household members aged productive

D2 = dummy variable for gender composition of the dominant in the household

0= if male ≥ female

1= if female < male

D3 = dummy variable for education level of head of household

0 = if head of household education < Junior

1= if head of household education ≥ junior

$\alpha$  = intercept

$\beta 1-\beta 7$  = parameter estimators

$\mu$  = error

Then, the second purpose is answered by quantitative descriptive analysis using tabulation and mathematical calculations of the average rice consumption of resident households (kg / kk / year) and then calculated the average consumption in kg /capita/year.

### 3. Results and Discussion

#### 3.1. Analysis factors which affect on rice consumption

Based on Table 1,  $R^2$  value obtained is equal to 0.65594 indicate that the variation of rice consumption rate in the city of Palembang 65.59% can be explained by the variables of family income, family size, the price of rice, prices of noodle as substitute in food, gender, and head of household education level. While the remaining 34.41% is a variable that is not included in the equation. Based on Table 1, F-count value is 16.84046, the value is significant at  $\alpha = 1\%$  level. Based on F-test results, it can be said that all of the variables, namely the family income, family size, the price of rice, noodles price, gender, and education level of family heads significantly influence on the level of rice consumption collectively for Palembang cases.

For more details, the following description of the factors that influence the level of rice consumption in the population in different income group in Palembang as follows: Income variables significantly affect the level of consumption of rice at  $\alpha = 5\%$ . Alleged parameter values obtained indicate that the variable rate revenue of -0.31621, which means that every 1 percent increases in revenues then the level of domestic rice consumption Palembang City residents will be reduced by 0.31621%, while the other variables being constant (*ceteris paribus*).

Number of family members significantly affect the level of rice consumption at  $\alpha = 5\%$ , with a value of 0.50015 alleged parameters, meaning that each additional family member of 1% then the consumption of rice will increase by 0.50015%, while the effect of other variables considered be fixed (*ceteris paribus*).



Table 1. Results Parameter Alleged Some Variables Affecting Rice Consumption Rate of Household Population Palembang

Explanatory variables	Alleged parameter values (Bi)	t-count	Prob-t	Remark
Intercept	7.25330	2.56392	0.01322	
Revenue	-0.31621	-4.97834	0.00001	A
Number of family members	0.50015	3.85716	0.00031	A
The price of rice	0.36238	0.49035	0.62591	-
The Price of noodles (subtitution goods)	-1.27188	-1.44082	0.15552	C
Sex composition	0.02009	0.59740	0.55278	-
Education head of household	-0.08171	-1.48026	0.14473	C
$R^2$	0.65594	Description:		
F-count	16.84046	A = significant at the level $\alpha = 0.05$		
DW	1.67565	B = significant at the level $\alpha = 0.10$		
		C = significant at the level $\alpha = 0.20$		
		D = significant at the level $\alpha = 0.30$		

The effect of rice price variable, the analysis shows that the price of rice did not significantly affect the level of rice consumption in the city of Palembang, this means that although the price of rice rose, people will still buy it, because rice is the staple food that can not be replaced by other foodstuffs.

Substitute rice obtained in this study is the predominantly by noodles. Based on the results of regression analysis, the price of a substitute significantly have negative effect on the level of consumption of rice by household in Palembang, where alleged parameter value is equal to -1.27188, which means that if the price of noodles increased by 1%, the total rice consumption would fall by 1.27188% , *ceteris paribus*. Regression analysis also showed that the gender composition variables did not significantly affect the consumption of rice.

Education level of the family patriarch in the samples varied start from primary school up to graduate level education as a high level. Based on the results of regression analysis showed that the alleged parameter values for the variables of education level is -1.48026, which was tested by the t test showed significant affect on the rice consumption in the level  $\alpha = 20\%$ . This means there are differences in the level of rice consumption among higher than junior high school level of education and lower junior high school level of education of family patriarch, where rice consumption by the family patriarch who educated junior high school or higher 1.48026% smaller than the rice consumption by families which level of education of family patriarch is lower than junior high school.

### 3.2. Analysis of Rice Consumption Based on per capita income level of residents

Palembang city residents tend to consume rice as a staple food. As a staple food, rice is not the only option for food primarily on the population of different income groups. Average of Rice Consumption for The High Income, Moderate Income and Low Income in the city of Palembang can be seen as the Figure 1.

Figure 1, shows that the largest rice consumption in the city of Palembang is in the population with low income levels, where the amount of rice consumed was 93.50 kg/capita/year, followed by moderate income level, where the amount of rice consumption was 60.30 kg/capita/year, while the lowest rice consumption is a population with high income levels, where the amount of rice consumption of 45.95 kg/capita/year. Based on this it could explained that increasing in the income of a society, will decreasing the amount of rice consumption, due to the income increased, then purchasing power for different types of food will increase.

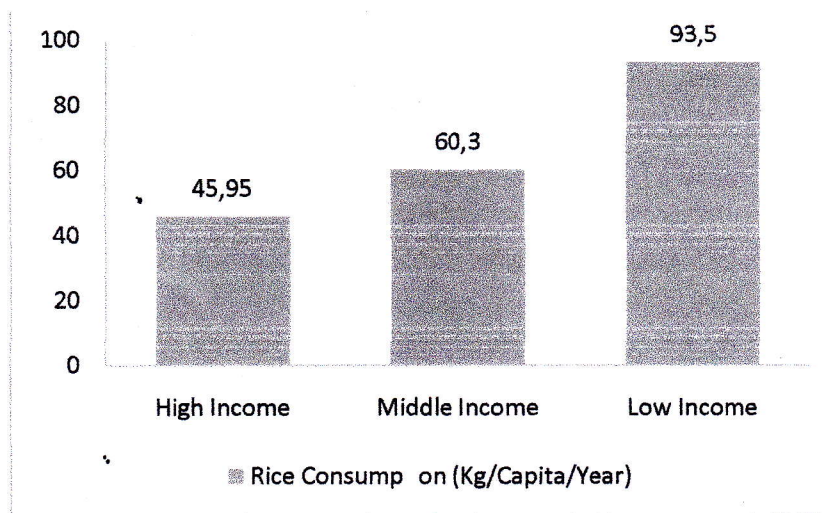


Fig. 1: Average Rice Consumption Per Capita Per Year Population Level at different income

## 4. Conclusion

### 4.1. Conclusion

Based on the results of research that has been done, it can be concluded as follows:

1. Factors that significantly affect the consumption of rice in of Palembang are the level/amount of income of resident income, family size, the price of substitution primarily instant noodles, and educational level of family patriarchy.
2. The highest consumption of rice is population of Household with low income levels, while the lowest consumption of rice is a population with high income levels.

### 4.2. Recommendation

1. As Palembang City is the largest rice consumer, then the distribution of the surplus to deficit areas should be conducted in accordance and without constraints.
2. Need to do more research on pricing policy of rice, inventory levels and distribution of rice in the rice deficit areas.

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