

# DIVERSIFICATION OF FOOD CONSUMPTION FOR FOOD SECURITY BASED ON LOCAL POTENCY AT HOUSEHOLD LEVEL IN SEMIN, GUNUNG KIDUL

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## Abstract

*The purpose of the research is to investigate and analyze factors influencing consumption diversification system based on local potency to create household food security. This research uses descriptive method from survey result. Research area is determined by purposive method and household sample is taken by proportional stratified random sampling with 50 households. The result of this research indicates that staple food based on local potency is still dominated by rice followed by cassava and corn. Staple food diversification system is rice, and rice substitution like corn, rice-corn, rice-cassava, and rice-corn-cassava. Factors which influence household consumption diversification system is food prices, household income, and number of family member*

**Keywords:** *diversification, food security, consumption, staple food*

## INTRODUCTION

In Indonesia food consumption variety is sometimes meant as reducing consumption of rice which is compensated by increasing consumption of non-rice. One of reason the importance of food diversification food is reducing the national dependence on rice import.

Food is a strategic and important commodity because food is basic need for human life and it is guaranteed by Law UU No. 7 Tahun 1996 on Food. Food sufficiency determines the quality of human resource and sustainability of a nation. Therefore to have better generation in Indonesia, food must be made available in sufficient number, equally distributed, safe, certifiable, nutritious, various number, and with affordable price.

Indonesia have rich food sources either vegetation or animal to fulfil food requirement. Indonesian people generally consume rice as staple food as source of carbohydrate, so dependency rate on rice is greater.

Food crisis which is experienced by various nations in world, including Indonesia, gives lessons that food security must be developed based on national potential. Higher rice import dependence has its potential economic, social and political instability (Juarini, 2006).

One of government policy on food is increasing the food diversification. This policy is not only addressed to lessen dependency on rice import, but also meant to change the pattern on food consumption of to be more various and better nutrition.

According to Peraturan Pemerintah Republik Indonesia No. 68 Tahun 2002 on Food Security, it is mentioned that food security is condition of sufficient food in terms of its quality and quantity, safe, equally distributed and affordable for household. This definition, the supply of food can be met from domestic product or import. However, it is important to have self-sufficient of national food by empowering its own natural resources, human capital, social capital and financial resources which in turn increasing social

and economic welfare. Food resilience which is still supported by import has its own risk in terms of its sustainability.

Every region has different pattern of consumption depending on its local potential and cultural. Consumption pattern in Indonesia is still dominated by grains, especially rice, which is indicated by higher starchy staple ratio. Public generally has strong dependency on rice as source of carbohydrate. Any effort to lessen this dependency, it need to explore local potency of non rice to fulfil food requirement.

In future it is expected to have consumption pattern which is nutritious, various in number, and proportional based on local potency. All of it creates sustainable food security. For that reason diversification of food consumption based on local potency is becoming urgent to be developed.

This research performs the study on staple food diversification pattern based on local potency at rural household. In addition, this study also analyses factors influencing this pattern for having food resilience.

## LITERATUR REVIEW

### Household Food Diversification

Food diversification is a process of selecting food materials which is not depended on only one food type but it also on various food materials. This process includes its production, process, distribution, and consumption at household level (Tampubolon, 1998). Food diversification is addressed to have various sources of food including complementary foods, vegetable, and fruits. This means that the more various and balanced of food composition, the better the quality of nutrition.

Food consumption at household level is basic need for every member of household for its food security. Food security includes sufficient number of food related to its quantity and quality. In this case, quality aspect is closely related to nutritional aspects based on food diversification because none of food has complete nutrition. On the other hands, the quantity

aspect of food is related to its volume and nutrient content of food (Departmental of Agriculture, 1999).

Food diversification has important role in several ways. *Firstly*, the reducing of rice consumption will decrease the rice import dependency. *Secondly*, food diversification will change resources allocation to be more efficient, stable and flexible if it is supported by empowering of local potency. *Thirdly*, food diversification creates Pola Pangan Harapan.

Staple food is primary needs which must be met by individual for every level of income. The different social and economic condition requires different food quantity and quality. Earning is primary factor determining the behaviour of household consumption pattern and its diversification. In general, the increasing income will increase the food diversification and improve the nutrient quality. For lower income household, the income is mostly spent on primary needs. This type of household has lower variation of food as well as worse nutritional aspect of foods. In contrast, the consumption pattern of high earning households tends to have various food consumption and nutrition.

Engel Law expresses lower income household spends almost all its income on fundamental needs. On the other hands, high income household only spend small part of its income on food (Nicholson, 1991). The increase in earnings will shift down the demand for staple food and shift up the demand for luxurious food. The indifference curve can be used to analyse the consumption behaviour which assumes that every consumption result in utility. Utility is satisfaction from consuming goods and service.

In this context, consumption is aimed at fulfilling nutrient for body. The consumption pattern is influenced by psychological, social and cultural condition. According to Riyadi (2003), the higher the education level, the higher the awareness of someone to have balanced consumption pattern and better nutrient food composition. Moreover the food consumed will be more various to meet better health condition.

The number of family member will also influence pattern of food consumption based on local potency. The increasing number of family member requires more food consumed as well as its variation because of different taste among family member.

### **Food Security**

In accordance to UU No.7/1996 about food states that development in food sector is stressing on food security. Different to this concept, FAO defines food security as ability of state providing food for their people. There are four components of this concept i.e. food availability, stability of supplies, access to supplies and food utilization.

WTO mentions food security as availability of food in the market. In short run importing food can overcome hunger while in long term it exhausts international reserve assuming disregard to any effort

to develop local potency. Hence food diversification has potential to create food security at rural household level.

Food security, it can widely be interpreted as ability to fulfil food sufficiency for society every time. Food sufficiency includes both quantity and quality, self produced or bought in the market. This food security is expressed on the availability of enough food, affordability in terms of its prices and diversified food either in production or consumption. This sufficiency should pay attention on production aspect, arrangement and management of supply, and provision enough quantity of food. Food resilience must also maintain the quality as well as nutrient aspect of food consumed. This good quality of food is result of various foods, nutritious, lawful and certifiable to be consumed. Quality of food consumed will influence quality of Indonesia human resources.

### **RESEARCH METHODOLOGY**

This research use descriptive method that is a method in checking status of group of human, an object, a set condition, a thought system and an event. Intention of descriptive research is to make description systematically, factual, and accurately about facts, nature and relation amongst phenomena investigated. Descriptive research studies the problems in society in given condition including the relationship amongst activities, behaviour and process influencing a phenomenon (Nazir, 1989).

In addition, the location of survey is in Semin, Gunungkidul. This location s determined by purposive under consideration of variation in consuming local-based food like rice, tapioca, and corn. The sampling is using stratified proportional random sampling. The number of sample is 50 households. This sample is grouped into 3 income level.

Regression analysis of Ordinary Least Square is used in this research. Before running regression analysis, it performs statistical test of classic assumption in order to get BLUE (Best Linear Unbiased Estimator) estimation. Classic assumption tested consists of testing to multicollinearity, heteroscedasticity and autocorrelation. Model used is as follows:

$$Y = b_0 + b_1 I_h + b_2 P + b_3 S + b_4 E + e$$

where

Y = staple food consumption at household level (Rp/capita/year)

I<sub>h</sub> = household earning (Rp/year)

P = price of food material (Rp/kg)

S = number of family member

E = education (year)

b<sub>0</sub> = constant

b<sub>i</sub> = regression coefficient (i=1,2,3,4)

e = error terms

The statistical test yields none of violation on classical assumption which are multicollinearity, heteroscedasticity and autocorrelation.

## RESULT

### Pattern Food Diversification Based On Local Potency

Semin is one of district in Kabupaten Gunungkidul having abundant local food potency like rice, corn, and tapioca (cassava). Currently the existing area is 1.942,2 ha in wide enabling to produce low-land paddy 78.738,80 quintal, high-land paddy 128.072,40 quintal and 3.491,8 ha of non-irrigated field capable to produce corn 90.415,17 quintal, tapioca 565.462,00 quintal and creep cassava 1.152,00 quintal.

Most of resident in Semin consume staple food like rice, tapioca and corn. When corn crop season, resident will consume more corn and when tapioca crop season they usually consume more tapioca. Tapioca is usually consumed in the form of tiwul that is tapioca-processed food. In consuming rice they usually mix with tiwul by comparison 1:2. Meanwhile, for corn-rice is not favourable since it need longer time to process.

In research area, there are 3 type staple food consumed by local rural people which are rice, tapioca and corn with different consumption pattern. Pattern of food consumption in Semin includes: (1) rice, (2) rice-corn, (3) rice-tapioca, and (4) rice-corn-tapioca.

Based on Table 1, it shows that food diversification based on local food potency is still dominant. The greater portion of consumption pattern of local food potency is rice-tapioca (48%) since it is easier in production as well as relatively cheaper.

Table 1: Diversification Pattern of Food Consumption at Household Level in Semin District

Main Consumption Food	Percentage (%)
Rice	14,00
Rice-Corn	16,00
Rice-Cassava	48,00
Rice-Corn-Cassava	22,00

On contrast, rice-corn food combination is less favourable (16%) since it needs longer time to process them. Diversification pattern of food consumption is addressed to lessen the dependency on rice so that have balanced food, various and nutritious food.

Staple food is the highest source of carbohydrate for rural people in Semin. On average food consumption based on local potency is presented in Tables 2.

Table 2: Staple Food Consumption Pattern at Rural Household in Semin

Main Consumption Food	Consumption (kg/capita/year)
Rice	548,64
Cassava	64,89
Corn	19,11

From Table 2, it can be shown that, tapioca is mostly consumed by rural households accounted for 594,89 kg/capita/year. Meanwhile, corn is least

consumed accounted for 190,11 kg/capita/year. The consumption on these two kinds of food besides rice will be able to lessen dependency on rice so that it creates food security at household level.

### Relationship Between Household Earnings and Food Consumption

Economic social condition determines the quantity and quality of food consumption. Household earning is primary factor determining by pattern food consumption and food diversification. The higher the income, the higher is the consumption even though in non proportional increase. The increasing will give opportunity for each household to perform food diversification in order to improve their nutrition. In this research, household earning is grouped into 3 classes which are low, medium and high income group. Average income of all classes is (X) Rp. 4.116.121,02 and its standard deviation (Sd) equals to Rp 1.287.104,55 while the detail classification as follows:

- Low income:  $X = \text{Rp } 2.829.016,47$

- Middle income:  $\text{Rp } 2.829.016,47 < X < \text{Rp } 5.403.225,57$

- High income:  $X = \text{Rp } 5.403.225,57$

Food consumption based on earning level is presented in Tables 3. Table 3 explains that at every earnings level, rice is staple food which is always consumed. The higher the income level, the lower the consumption of tapioca and the higher the consumption of corn.

For lower income group, the food consumption pattern tends to consume food materials based on local potency and less variation on food. This figure is completely different to which higher income group. The amount of food consumption will influence the level of expenditure on food (Table 4).

Table 3: Consumption Level of Staple Food at Household Level Based on Income Level in Semin

Income Group	Consumption (kg/capita/year)		
	Rice	Cassava	Corn
Low	349,44	51,11	9,55
Middle	610,92	78,33	19,44
High	562,50	35,00	28,75

Table 4: Spending on Food Consumption Based on Earnings Level in Semin (Rp)

Income Group	Rice	Cassava	Corn	Expenditure (Rp)
Low	806.666,67	34.555,55	9.555,55	850.777,77
Middle	1.492.851,85	53.240,74	19.444,44	1.565.537,03
High	1.570.750,00	29.250,00	28.750,00	1.628.750,00

From 4 tables, it is known almost all income is spent on rice. On average the consumption level for lower income group is Rp. 850.777,78, while for medium earnings level it is Rp 1.565.537,03. Meanwhile for the higher income level, the spending on food is Rp. 1.628.750. The higher the income, the higher is the spending on food.

Consumption on food differs between households depending on the earnings level. The higher the income level, the more quantity food is consumed since the higher income will give greater chance to improve the quality of food so that having better nutrition. Moreover they are able to buy other more qualified and nutritious food.

### Factors Influencing Local Food Consumption Household Earnings

Besides the prices, earning is primary factor determining household pattern in in food consumption. Earning expresses the purchasing power of that money in terms of quantity and quality of food. The higher the income, the higher the purchasing power in quantity or quality of food consumed.

Pattern of food consumption is closely related to social economic condition of household. The lower the income, the more people rely on local food potency as well as less various and worse food quality. Different to the lower income group, the higher income group has various and better quality of food by consuming nutrient food materials.

### Food Price

The price of goods is fluctuating and tending to increase. The change in food price change food will alter the quantity and quality of food consumed. Theoretically speaking, the decreasing in price will increase the quantity demanded. On the contrary if price is rising hence the quantity of goods demanded will experience downdraft holding other factors constant. It implies that the price of food material has an effect on local food consumption. On other words, the fluctuation on food prices also determines the local food consumption. T statistic which is larger than its critical value explains that food prices has significant effect on local food consumption pattern (Table 5).

Table 5: Regression Analysis of Factors Influencing Food Diversification Pattern at Household Level in Semin

Variables	Regression Coefficient	T statistic
Ih	0,1612	4,701***
P	-432,3629	-1,996*
S	0,3602	6,534**
E	0,1675	1,173
R- Square	0,734	
R- Square Adj	0,62	
F-Statistic	9,73	
F-Table	5,18	

Notes \*\*\* = significant at 1% level  
\*\* = significant at 5% level

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\* = significant at 10% level

### Number of Family Member

Number of family member has influence on food consumption pattern based on local potency. The variety on food increase as more number of family members because of more different of individual taste.

More number of family members requires the head of household to increase its income in order to meet higher food requirement. On average the number of family member is 4,3 that means head of family should bear 4 people in his family. The spending on food consumption will increase as increasing the number of family member.

### Education

Pattern of food consumption depends on its education level of head of family. Having formal education enables to have better knowledge and understanding on the importance of food quality being consumed to improve their health condition. Hence they consume various type of food to meet their nutritional and health requirement.

Estimation result shows that household earnings (Ih), the price of food (P), number of family member (S) and education (E) can explain 62% variation of food diversification pattern. While 0,38 or 38 % is explained by other factors not estimated in the model. All variables observed also have joint significant effect which is explained by F statistic exceeding its critical value (5,18).

Based on t test, three of four variables which are household earnings, food price and number of family member have significant effect at 10% level. However, the education is not significant in influencing the dependent variables at 10% significant level.

### CONCLUSION

In effort to realizes food resilience and lessen rice dependency at rural households, they explore the non-rice local potency. It is shown by the variation in local-based food consumption. Staple food diversification pattern includes rice, and its substitution such as rice-corn, rice-tapioca and corn-tapioca. The consumption pattern in practice is able to lessen the dependency on rice. Consumption patter is different to each household depending on its earnings level. Factors influencing by pattern of food diversification at rural households are earnings, food prices, and number of family members.

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