

# Socioeconomic Characteristic of Household Food Security in South Sumatra

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**Abstract**—This paper discusses the relationship of socioeconomic characteristics of households in South Sumatra to food security. Food security is measured by the proportion of household food consumption expenditure. The socioeconomic characteristics of household food security illustrate: first, stability of food security (stability), namely the number of household members and the work of the head of the household; second, the availability of food in the household (food availability), namely households receiving Social Assistance (social aid) and the ability to access food (access to food), namely sex, education of the head of the household, age of the head of the household, income of the head of the household and the area of residence. This paper uses data from South Sumatera National Socio-Economic Survey (SUSENAS) for the 2018 Consumption Expenditure Module with a sample of 9,732 households. The analytical method in this study is a qualitative analysis to describe the condition of household food security levels with an approach to measuring the degree of food security according to Jonsson and Toole (1991). Estimation results using the OLS model. The results showed that households in South Sumatra included in the category of Less Food, Vulnerable and Food Insecurity amounted to 53.2 percent. Based on the three characteristic of household food security, the food availability indicator, which is the variable accepting or not accepting social protection programs (social aid), is the variable that most influences the level of household food security. Furthermore, the variable that affects household food security is the number of household dependents as an indicator of food stability. From the access to food indicator, it can be seen that households living in rural areas have a lower level of food security than urban households.

**Keywords:** *food security, household consumption, SUSENAS*

## I. INTRODUCTION

The Central Statistics Agency (BPS) defines poverty as a person's inability to meet food and non-food needs as measured by expenditure [1]. *District/City Poverty Data and Information for 2017* (BPS, 2017) shows that the main consumption in poor households is food consumption. In other words, poor households are more focused on meeting food needs than non-food. Therefore, food consumption, namely food, is very much related to poverty.

This is in accordance with Engel (1857), household welfare can be reflected by the structure of food consumption expenditure, that the higher the level of family income, the lower the percentage of expenditure for food consumption [7]. Similarly, the statement of Deaton and

Muelbauer that the higher welfare of the community then the proportion of expenditure of food will be smaller so the opposite [2].

In addition to describing well-being, according to [5], a large proportion of food expenditure can also be used as an indicator of food security. The greater the proportion of expenditure allocated to food, which indicates diminishing food security. Based on the theory, it can be said that there is an indication of improving people's welfare in Indonesia. Indonesia's population consumption expenditure Data of 2016 [1] shows the percentage of monthly per capita expenditure rate by residential areas, it can be seen that the proportion of food consumption expenditure in urban and rural areas is 48.4 percent and Non-food 51.3 percent, for urban areas as much as 44.57 percent of the portion of food expenditure and 55.43 percent of the portion of non-food expenditure while the rural area shows that the portion of food expenditure is still greater, namely 55.83 percent compared to non-food amounting to 44.17 percent. Another study described the pattern of food consumption by comparing according to the regional typology among other islands in the study of [12] and [17]; between rural and urban areas by [14], [16] and [3].

## II. LITERATURE REVIEW

### A. Consumption Behavior Theory

Consumption consists of government consumption and household or community consumption [13]. Between the two, household consumption expenditure has the largest share in total aggregate expenditure. [15] states that household consumption expenditure is the value of spending done by households to purchase various types of needs in a given year. The income received by the household will be used to buy food, finance transportation services, pay for children's education, pay rent for houses, and buy vehicles. These goods are purchased by households to meet their needs, and these expenditures are called consumption.

Goods that are produced specifically for use by the community to meet their needs are called consumer goods. Consumable goods are divided into three groups, namely perishable goods, such as vegetables and fruits; semi-durable goods (*semi-durable goods*), such as

shoes and clothing; durable goods (*chirable goods*), such as cars, motorcycles, and televisions [15].

The rapid development of society causes consumption behavior to change rapidly. [8] states that government consumption is exogenous, whereas household consumption is endogenous. Thus, the amount of household consumption is closely related to other factors deemed to affect it.

Basically, the main factor that affects the consumption level of society is revenue, the correlation is both positive, if the income level is getting higher ( $Y$ ), then the consumption ( $C$ ) is also increasingly higher. The consumption function shows the relationship between the level of consumption expenditure with the level of income. The consumption function is expressed in the following equation (Huda, 2008):

$$C = a + bY \quad (1)$$

$C$  = The amount of household consumption expenditure,

$a$  = The amount of consumption is not dependent on the sum of income or consumption if there is no income,

$b$  = People's marginal desire to consume,

$Y$  = *Disposable* income (income that is ready for consumption)  $a > 0$  and  $0 < b < 1$ .

In general, household income can reflect the level of welfare. One economic theory linking consumption expenditure with income was stated by Ernst Engel in 1853 in Belgium. Engel's Law concludes that the proportion of expenditure on food decreases if the income of the community increases. Comparative studies between countries show that in general people in developing countries spend a greater percentage of income when compared to the percentage of food expenditure in developed countries. Furthermore, the analysis of time periods shows that the percentage of income spent on food tends to decrease if income increases. Many experts recommend using the proportion of expenditure on food as an indicator of poverty (Nicholson, 1994).

Keynesian consumption theory explains that *current consumption* is strongly influenced by *current disposable income*. According to Keynes, there is a minimum consumption limit that does not depend on the level of income. That is, the level of consumption must be met, even though the level of income is zero. That is called autonomous consumption (*autonomous consumption*). If disposable income increases, consumption also increases. It's just that the increase in consumption is not as big as the increase in *disposable income* (Rahardja and Manurung, 2004). The marginal propensity to consumption (*Marginal Propensity to Consume*= $MPC$ ) is a concept that gives an idea of how much consumption increases when disposable income increases by one unit.

Keynes conjectured that the marginal propensity to consume (*Marginal propensity to consume*) the amount consumed on any extra income is between zero and one. The marginal propensity to consume is crucial for Keynes's policy recommendations to reduce increasingly widespread unemployment. The power of fiscal policy, to influence the economy as shown by the fiscal policy

multiplier arises from the feedback between income and consumption (Mankiw, 2003).

Rahardja and Manurung (2004) classify the factors that affect consumption into the top three namely economic, demographics (population), and non-economic. Economic factors are household income, household wealth, interest rates, estimates of the future. Demographic factors are population, and population composition according to age (productive or unproductive), education (low, middle, high), living area (urban or rural). Non-economic factors are socio-cultural, including changes in habits, ethics, and values.

### B. Food Security

Food consumption is a basic human need and guaranteed by the state because food is considered as the most essential human basic needs and absolute things that must be met. Law Number 18 of 2012 concerning Food states that food is the most important basic human need and its fulfillment is part of human rights guaranteed in the 1945 Constitution of the Republic of Indonesia as a basic component to realize quality human resources. Therefore, the state is obliged to realize the availability, affordability, and fulfillment of adequate, safe, quality and balanced nutritious food consumption, both at the national and regional levels to individuals evenly throughout the territory of the Republic of Indonesia (NKRI) at all times by utilizing local resources, institutions and culture. Law Number 18 Year 2012 states that food security is a condition for the fulfillment of food for the country up to individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable, and affordable, and does not conflict with religion, beliefs and community culture, to be able to live healthy, active and productive sustainably.

Jonsson and Toole (1991) in Maxwell et al. (2000) classify household food security through a combination of two indicators of food security, namely food sufficiency and the share of food expenditure. According to Sundari and Djalal (2015), the two indicators can represent the level of household food security well. Food sufficiency is identified from indicators of the adequacy of calories consumed and illustrates the productivity of human resources. The 100 percent calorie adequacy limit is 2,000 kcal/capita/day. A household is said to have enough calories if the household's per capita calorie consumption is more than 80 percent ( $> 1,600$  kcal/capita/day). Households are said to be less calorie if household per capita calorie consumption is less than or equal to 80 percent ( $< 1,600$  kcal/capita/day). The share of food expenditure is the ratio of expenditure for food expenditure and total household expenditure for a month. The share of food expenditure illustrates purchasing power. The share of food expenditure is said to be low if  $< 60$  percent and said to be high if  $> 60$  percent.

The share of food expenditure is calculated from the ratio between food expenditure to total household

expenditure. Food expenditure share ratio can be formulated:

$$PPP_i = \frac{PP_i}{TP_i} \quad (2)$$

PPP<sub>i</sub> shows the share of the i-th food expenditure, PP shows the i-th food expenditure and TP shows the total household food expenditure.

Table 1 shows that the share of food expenditure is high at more than 60 percent of 4,502 households or 46.03 percent. Thus, it can be seen that more households have a larger share of non-food expenditure compared to the portion of food expenditure. In the calorie adequacy indicator, it can also be concluded that 88.3 percent of households include households with enough calories which is more than 1600 calories/capita/day.

TABLE I. HOUSEHOLD DISTRIBUTION IN SOUTH SUMATRA BASED ON SHARE OF FOOD EXPENDITURES AND CALORIE ADEQUACY

Food Spending Share	Amount	Percentage (%)	Calorie Adequacy	amount	Percentage (%)
Low	5230	53.7	Enough	8590	88.3
High	4502	46.3	Less	1142	11.7
Total	9732	100.0	Total	9732	100.0

Source: 2018 SUSENAS, Data processed 2019

Both categories of each indicator are crossed to produce four categories of household food security degrees, namely food resistant, food vulnerable, food insecure, and food-insecure households. For more details, measurements of the degree of food security and the share of food expenditure and calorie adequacy can be seen in the following table.

TABLE II. MEASUREMENT OF HOUSEHOLD FOOD SECURITY DEGREE

Calorie Adequacy	Food Spending Share	
	Low (<60%)	High (> 60%)
Enough (> 80%)	Food hold (Category 3)	Food Vulnerable (Category 2)
Less (<80%)	Not enough food (Category 1)	Food Prone (Category 0)

Sources: Jonsson and Toole (1991) in (Maxwell et al., 2000)

Table 3 shows that 46.8 percent of households belong to the category of Food Security, 41.4 percent of Food Vulnerable dams and the rest belong to the category of Poor and Food Insecurity. Thus, households that are more in need of government attention in terms of social protection by 11.8 percent. However, the calorie adequacy measure in this study was 2000 calories/capita/day. If a calorie size of 2500 calories/capita/ day is used, then the number of households in the category of Less and Food Prone becomes more.

TABLE III. DISTRIBUTION OF HOUSEHOLD BASED MEASUREMENT OF FOOD SECURITY DEGREES

Food Security Degrees	Amount	Percentage
Not enough food	670	6.9
Food Prone	476	4.9
Food Vulnerable	4,032	41.4
Food hold	4,554	46.8
Total	9,732	100.0

Source: 2018 SUSENAS, Data processed 2019

### III. METHOD

This paper analyzes the relationship of socioeconomic characteristics of households in South Sumatra to food security. The food security variable is measured by the proportion of household food consumption expenditure. Socio-economic characteristics that describe: first, stability of food security (stability), namely the number of household members and the work of the head of the household; second, the availability of food in the household (*food availability*), namely households receiving Raskin Social Assistance (*food aid*); and the ability to access food (*access to food*), namely sex, education of the head of the household, age of the head of the household, income of the head of the household and the area of residence.

The data used in this paper is data from the South Sumatra National Socio-Economic Survey (Susenas) of Consumption Expenditure Module in 2018 with a sample of 9,732 households. The analytical method in this study is a qualitative analysis to describe the condition of household food security levels. While quantitative analysis with the aim of obtaining a thorough description of the quantitative aspects of this research variable. Quantitative analysis using econometric models to analyze the effect of socioeconomic characteristics on household food security. The econometric model was developed from research conducted by Noor and Satria (2018), Sari (2016) Wuryandari (2015), Sundari and Djalal (2015), and Masykur and Nashir (2015).

$$Y = f(X) \quad (3)$$

Y = Food Security

X = Socio-Economic Characteristics of Food Security

$$Y = f(X_1, X_2, X_3) \quad (4)$$

Y shows food security as measured by the portion of household food consumption expenditure in a month in percent.

X<sub>1</sub> shows *Food Availability* namely Food Availability measured by poor households receiving or not receiving social protection programs by the government, either the Poor Rice (Raskin)/Prosperous Rice (Rastra) Program, Social protection Card (KPS)/Prosperous Family Card (KKS), and the Family Hope Program, then X<sub>1</sub> = Social = Recipient of Social Protection, namely 1 to Receive the Program and 0 to Not Receive the Program;

X<sub>2</sub> shows that Stability is Food Security Stability measured by the variable number of family members (Fam), namely the number of family members borne by the head of the poor household in-person units and the work variable of the head of the household (Work) in the formal sector = 1 or not the formal sector (informal) = 0.

X<sub>3</sub> shows *access to food* is the ability to access food with variables as follows:

- Income is measured by the income of the head of the household in a month in units of Rupiah.
- Gender (Gender) as measured by the sex of the head of the household, 1 = male or 0 = female.

- Education (Edu) as measured by the level of formal education of the household head is the level of education completed in units of the year.
- Age (age) is measured by the age of the head of the household in units of years.
- The typology of the region (Residential area, Reg) measured from the residence of the head of the household according to regional classification is the area of residence of the household categorized as urban or rural from BPS. 1 = Urban or 0 = Rural.

Thus, the econometric model influences the socioeconomic characteristics of food security on food security in this study, namely:

$$Y_{ij} = \alpha + \beta_1 DSocial_{ij} + \beta_2 Fam_{ij} + \beta_3 DWork_{ij} + \beta_4 Income_{ij} + \beta_5 DGender_{ij} + \beta_6 Edu_{ij} + \beta_7 Age_{ij} + \beta_8 DReg_{ij} + \mu_i$$

- I : 1st, 2, 3, ..., n household
- $\alpha$  : constant
- $\beta_{1-8}$  : Regression Coefficient of Each Independent Variable

**IV. RESULTS**

Table 4 shows that 25.0 percent of households have income levels below the Regional Minimum Wage of South Sumatra Province. Most households are in the income level category of 2-4.9 million rupiah. Around 17 percent of households have an income greater than 5 million rupiahs.

TABLE IV. HOUSEHOLD DISTRIBUTION BY HOUSEHOLD INCOME LEVEL

Income (IDRpupiah)	Amount	Percentage
<= 1,999,999	2,508	25.8
2,000,000 - 4,999,999	5,504	56.6
5,000,000 - 7,999,999	1,164	12.0
8,000,000 - 10,999,999	329	3.4
11,000,000 - 13,999,999	110	1.1
14,000,000 - 16,999,999	50	0.5
17,000,000 - 19,999,999	23	0.2
20,000,000 - 22,999,999 <	44	0.5
Total	9,732	100

Source: 2018 SUSENAS, Data processed 2019

TABLE V. HOUSEHOLD DISTRIBUTION BASED ON EMPLOYMENT STATUS

Job-status	Amount	Percentage
Trying Alone	2,576	26.5
Trying to be assisted by temporary workers	2,532	26.0
Trying to be assisted by permanent workers	372	3.8
Workers / Employees / Employees	2,760	28.4
Free worker	437	4.5
Family worker / Not paid	65	0.7
Does not work	990	10.2
Total	9732	100%

Source: 2018 SUSENAS, Data processed 2019

Based on the status of the work, it can be seen that the number of household heads who work informally includes the head of the household with on their own, trying to be assisted with temporary workers, casual workers and family workers/not paid as much as 5,610 people and work with the status of a formal job includes trying assisted by permanent workers and laborers, as many as 3,132 employees.

TABLE VI. DISTRIBUTION OF HOUSEHOLDS BY AGE OF HEAD OF HOUSEHOLD AND GENDER

Working-age	Amount	Percentage
< 20	44	0.5
21-27	333	3.4
28-34	1,223	12.6
35-41	1,911	19.6
42-48	1,906	19.6
49 - 55	1,637	16.8
56 - 62	1,275	13.1
63>	1,403	14.4
Average	35 years old	
Gender	Amount	Percentage
Girl	1,179	12.1
Male	8,553	87.9
Total	9,732	100%

Source: 2018 SUSENAS, Data processed 2019

Table 6 shows heads of households in non-productive age (over 56 years) of 27.5 percent and under 21 years of age of 0.5 percent. Thus, more than 72 percent are heads of households of productive age. The age of household heads is below the average of 35 years at 16.5 percent. Age is related to the ability of the head of the household to get income. Age in productive categories will increase the ability of household heads to increase the number of hours worked so that increased income will determine the portion of food and non-food consumption expenditure. Table 5 also shows that 87.9 percent of the household sample was headed by men.

TABLE VII. DISTRIBUTION OF HOUSEHOLDS BY EDUCATION LEVEL

Level of education	Amount	Percentage
Not completed in primary school	2,205	22.7
Elementary school	3,200	32.9
Middle School	1,627	16.7
High school	2,153	22.1
Diploma	127	1.3
Bachelor	352	3.6
Postgraduate / Doctor	68	0.7
Total	9,732	100

Source: 2018 SUSENAS, Data processed 2019

Based on the level of education, it can be seen that the head of households with higher education is only 5.6 percent or as many as 547 people, as many as 9,185 household heads have a high school education level or below. The larger sample of households with lower secondary education can occur because 68.3 percent of the sample are households that live in rural areas. From a sample of 9,732 households, there were 15.9 percent of households received Social Protection programs from the government including the Poor Rice (Raskin)/Prosperous Rice (Rastra) Program, Social protection Card (KPS)/Prosperous Family Card (KKS), and Family Program Hope.

TABLE VIII. DISTRIBUTION OF HOUSEHOLD BASED RECIPIENTS OR NOT RECEIVED SOCIAL PROTECTION PROGRAMS

Social Protection Program	Amount	Percentage	The Region	Amount	Percentage
Not Accepting the Program	8,187	84.1	The country side	6,643	68.3
Program Recipients	1,545	15.9	Urban	3,089	31.7
Total	9,732	100	Total	9,732	100

Source: 2018 SUSENAS, Data processed 2019

Based on the estimation results simultaneously all independent variables have a significant effect on food security variables, namely the share of food expenditure. Table 9 shows the equations obtained as follows:

$$Y = 60.409 + 2.388 \text{ Social} + 2.095 \text{ Fam} - 1.915E-6 \text{ Income} + 1.753 \text{ Gender} - 0.582 \text{ Edu} - 0.11 \text{ Age} - 2.288 \text{ Reg} + 0.356 \text{ Work} + \mu$$

When viewed from Table 9, all variables are significant except age and occupational status, which are not significant because they are above alpha 5 percent. Thus, age does not affect food security. Likewise, formal and informal employment status does not affect food security.

TABLE IX. RESULTS OF MULTIPLE REGRESSION ESTIMATES OF THE MODEL OF FOOD SECURITY LEVEL

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	60.409	0.660		91.507	0.000
Social	2.388	0.281	0.072	8.483	0.000
Fam	2.095	0.072	0.258	28.965	0.000
Income	-1.915E-6	0.000	-0.466	-50.070	0.000
Gender	1.753	0.327	0.047	5.368	0.000
Edu	-.582	0.034	-0.162	-16.933	0.000
Age	-.011	0.008	-0.011	-1.282	0.200
Reg	-2.288	0.231	-0.087	-9.910	0.000
Work	.356	0.228	0.014	1.566	0.117

Source: 2018 SUSENAS, Data processed 2019

Of the 6 independent variables that affect food security, social variables that indicate food availability have the greatest effect. Significant value on social variables shows that there are differences in influence between households that receive social protection programs from the government and households that do not receive. It can be seen that households that receive social protection programs are more food resistant than households that do not receive. Variable number of dependents (Fam) which describe food stability, shows a positive effect. The greater the number of household dependents, the greater the portion of household food expenditure.

Food security as seen from access to food can be seen from the income variable (income) which has a significant effect but the effect is very small. The next variable is gender which also significantly influences food security, namely in households with male household heads having higher levels of food security than female household heads. Regional typology (Reg) variable shows the difference of influence between households living in rural and urban areas. In households that live in urban areas, the level of

food security is higher compared to households that live in rural areas. The portion of food expenditure compared to total expenditure in urban households is lower than in rural areas. Urban households have greater expenditure on non-food expenditure, on the other hand rural consumption expenditure is greater on food expenditure. The level of education has a negative effect on food security, meaning that the higher the level of education the lower the portion of food expenditure so that the level of food security is getting better.

## V. CONCLUSION

Households in South Sumatra are included in the category of Food Hold for 46.8 percent. Based on the three indicators of food security, the food availability indicator, which is the variable that receives or does not receive social protection programs, is the variable that most influences the level of household food security. Furthermore, the variable that affects household food security is the number of household dependents as an indicator of food stability. From the access to food indicator, it can be seen that households living in rural areas have a lower level of food security than urban households.

## VI. SUGGESTION

The social protection program need to be continued, because there are many household have condition food insecure and households receiving social protection programs more food secure than the households did not.

## VII. ACKNOWLEDGMENT

This research has been supported by Sriwijaya University Foundation and participant partners as data entry parties.

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