Determinants of Rubber Farming Household Consumption A Case Study of Musi Rawas Regency, South Sumatera Province

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Abstract. The problem studied is the expenditure pattern of the households engaged in the rubber farming industry in Musi Rawas Regency, South Sumatra Province. The analysis method was a multiple regression model with food and non-food consumption expenditure as the dependent variable and spendable income, the number of family members, and investment in education as independent variables. The findings uncovered that spendable income, and the number of family members were the household expenditure models for food consumption that had a significant impact. Meanwhile, food consumption was unaffected by the educational investment variable. In the non-food consumption model, all variables, i.e., spendable income and educational investment, had a significant effect. Additionally, the expenditure pattern of households engaged in rubber farming showed that they tended to spend more on non-food consumption, such as vehicle fuel and donations that have become the culture or tradition of the local community. Hence, to improve the welfare of rubber farming households and boost their income, this study recommends implementing affirmative policies that ensure price stability.

1 Introduction

With a variety of natural resources and biological potential, Indonesia is one of the most agriculturally productive nations in the world. The natural and climatic factors that encourage the growth of the agricultural and plantation sectors have turned this industry into a cornerstone of the Indonesian economy. Notably, the sector of rubber plantations serves as a pillar of the Indonesian economy by creating employment opportunities, serving as a source of raw materials for the industrial sector, and providing a source of raw materials to produce equipment for education, health, and other sectors. In this instance, the foundation for growing the rubber plantation industry is the role of the rubber farmer household [1]. The development of the rubber plantation sector is also tied to improving household welfare for rubber farmer households. The quality and quantity of consumer expenditures, influenced by rubber farmers' income levels, can significantly indicate their welfare [2]. However, the problem faced is that the income earned by rubber farmers

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sometimes cannot meet the basic needs of farmer households for food and non-food consumption [3]. For this reason, the main idea of this study and, at the same time, the research gap of this research is to analyze the determinants of household consumption of rubber farmers in Musi Rawas Regency, South Sumatra Province, as one of the main areas for rubber producers, as shown in the following table:

Table 1. Area and Production of Plantation Plants in 2016 in Purwodadi Sub-district, Musi Rawas Regency, South Sumatra Province

No	Commodity	Area (Ha)	Production Tons	Average Production Ton/Ha/Year
1	Rubber	3641	3009.4	16.7
2	Coffee	-	-	-
3	Smallholder Oil-palm	49	39	-
4	Coconut	55	25.5	5
5	Cinnamon	-	-	1
6	betel nut	-	-	-
7	Cocoa	16	13.32	1.48
8	Sugar palm	-	-	-
9	Candlenut	-	-	-

Judging from the data on plantation crops in Purwodadi Sub-district, based on their use, the most extensive plantation area is rubber, amounting to 3641 Ha, with an average production of 16.7 tons/ha/year, and the rest is for other crop plantations, such as smallholder oil palm, coconut, and cocoa.

Table 2. Details of Allocation of Household Consumption Expenditure (Food and Non-Food)

No	A. Food Expenditure	No	B. Non-Food Expenditures
1	Grains	1	Housing and household facilities
2	tubers	2	Various goods and services
3	Fish/shrimp/squid/scallops		a. Body care products (soap, toothpaste, perfume, and others)
4	Meat		b. Reading (Newspapers, magazines, books)
5	Eggs and milk		c. Communication
6	Vegetables		d. Motor vehicle
7	Nuts		e. Transportation
8	Fruits		f. Housemaid and driver
9	Oil and fat	3	Health
10	Drinks	4	Education
11	Other consumption	5	Clothing, footwear, and headgear
12	Prepared food and drink	6	Durable goods
13	Tobacco	7	Taxes, levies, and insurance
		8	The necessity for parties and ceremonies

2 Theoretical Framework

Household economic behavior concerns the consumption of goods and services to achieve maximum utility due to fulfilling economic needs. The utility formulation of household consumption behavior is formulated in the following equation [4]:

$$U = U\ (X_1, X_2, ...X_n)$$

The meaning of this equation indicates that household utility from consumption behavior is determined by the number of goods consumed. The household consists of

husband, wife, and children, so each family member's contribution will determine the household's utility [2]. Consumer behavior can be explained using the following indifference curves and budget lines [2].

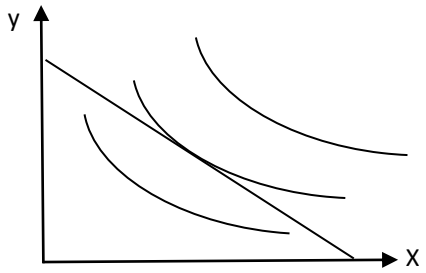

Fig. 1. Consumer Behavior

Consumer balance occurs at point B, depicting the indifference curve and the budget line intersection. Rational consumers will choose point B since, at this point, maximum satisfaction is realized [5]. Moreover, the consumption pattern, categorized into food and non-food consumption, systematically determines consumer preferences. The following table describes household consumption, both for food and non-food items.

3 Research Method

Research on the determinants of household consumption expenditure of rubber farmers in Musi Rawas Regency, South Sumatra Province, is a quantitative investigative study conducting field searches to find objective data from research subjects. The number of research respondents was 100 rubber farming families from a total population of 2847 rubber farming families [6].

3.1 Research Model

The research model on household consumption expenditure of rubber farmers was divided into two categories: expenditure for food consumption and non-food consumption, with the following equation [5].

$$KP = \beta_0 + \beta_1 PSD + \beta_2 IP + \beta_3 JAR + e \quad (1)$$

Where:
KP : Food consumption (IDR/month)
PSD : Spendable income (IDR/month)
IP : Educational investment (IDR/month)
JAR : Number of household members (Person)
e : Term of error

$$KNP = \beta_0 + \beta_1 PSD + \beta_3 IP + e \quad (2)$$

Where:
KNP : Non-food consumption (IDR/month)
PSD : Spendable income (IDR/month)
IP : Educational investment (IDR/month)
e : Term of error

$$KT = KP + KNP \quad (3)$$

Statistical tests were carried out to prove the hypothesis through t-statistical testing (individual significance test) and F-statistical tests (joint variable significance test), with the degree of confidence used in this study (α) = 0.05. Classical assumption tests were performed to obtain valid estimation results, including the multicollinearity, autocorrelation, and heteroscedasticity tests.

4 Research Results and Discussion

This study, the variables used to determine the factors influencing food consumption of rubber farming in the Purwodadi Sub-district were income as the dependent variable and spendable income, educational investment, and the number of household members as independent variables [7].

4.1 Food Consumption

The following is the multiple linear regression equation in this study:

$$KP = \beta 0 + \beta 1PSD + \beta 2IP + \beta 3JAR + e \quad (4)$$

Where:
KP = Food consumption (IDR/month)
β0 = Constant
β1, β2, β3, = Regression coefficient of each variable
PSD = Spendable income (IDR/month)
IP = Educational investment (IDR/month)
JAR = The number of household members
e = Term of error

Processed with the help of the EViews 7.0 program using the Ordinary Least Square (OLS) method, this study analyzed the factors influencing household food consumption in rubber farming businesses. Following are the multiple linear regression analysis results:

Table 3. Multiple Linear Regression Results

Variable	Coefficient	t-Statistic	Prob.	Conclusion
Intercept	9.371100	19.31089	0.0000	Significant
PSD (X1)	0.253274	7.555804	0.0000	Significant
IP (X2)	-2.69E-08	-1.203819	0.2316	Not significant
JAR (X3)	0.122709	6.495999	0.0000	Significant
F-statistic	49.80206			
Prob (F-statistic)	0.000000			
R-squared	0.608812			
Adjusted R-squared	0.596587			

Based on calculations using multiple linear regression models, the following results could be obtained:

$$KP = 9.371100 + 0.253274PSD + (-2.69E\text{-}08)\ IP + 0.122709JAR + e$$

The multiple linear regression equation results can be interpreted in the manner mentioned below. The equation β0 = 9.371100 states that the value of food consumption in the Purwodadi Sub-district will be positive and equal to 9.371100 if the variables spendable income (PSD), educational investment (IP), and the number of household members (JAR) are assumed to be ceteris paribus (the independent variables are considered constant or zero). Then, β1 = 0.253274 indicates that if the spendable income variable increases by one unit, the household food consumption for rubber farming in Purwodadi Sub-district will

increase by 0.253274 units, assuming other variables, such as investment in education and the number of household members, are considered constant or fixed.

In addition, β2 = (-2.69E-08) denotes that if the educational investment variable increases by one unit, household food consumption for rubber farming in Purwodadi Sub-district will decrease by -2.69E-08, assuming the spendable income and the number of households members variables are considered constant or fixed. Meanwhile, β3 = 0.122709 signifies that if the variable number of household members increases by one unit, household food consumption for rubber farming in Purwodadi Sub-district will increase by 0.122709, assuming the spendable incomes and educational investment variables are considered constant or fixed [8]. In this research, the variables used to determine the factors influencing the non-food consumption of rubber farming households in the Purwodadi Sub-district were non-food consumption as the dependent variable and spendable income and educational investment as independent variables. The following is the multiple linear regression equation in this study [9]:

$$KNP = \beta_0 + \beta 1PSD + \beta 2IP + e \quad (5)$$

Where:
KNP = Non-food consumption (IDR/month)
β_0 = Constant
β_1, β_2, = Regression coefficient of each variable
PSD = Spendable income (IDR/month)
IP = Educational investment (IDR/month)
e = *Term of error*

The data were processed with the help of the EViews 7.0 program, using the Ordinary Least Square (OLS) method, to analyze the factors influencing the non-food consumption of rubber farming households in this study. Following are the multiple linear regression analysis results:

Table 4: Multiple Linear Regression Results

Variable	Coefficient	t-Statistic	Prob.	Conclusion
Intercept	5.187353	7.943221	0.0000	Significant
PSD (X1)	0.593668	13.55298	0.0000	Significant
IP (X2)	-1.16E-07	-3.807622	0.0002	Significant
F-statistic	93.69166			
Prob (F-statistic)	0.000000			
R-squared	0.658911			
Adjusted R-squared	0.651878			

Based on calculations using multiple linear regression models, the following results could be obtained:

$$KNP = 5.187353 + 0.593668PSD + (-1.16E-07)\ IP + e$$

The interpretation of the multiple linear regression equation results is as follows. β0 = 5.187353 means that if the spendable income (PSD) and education investment (IP) variables are assumed to be ceteris paribus (the independent variables are considered constant or zero), the value of non-food consumption in Purwodadi Sub-district will be positive by 5.187353. Then, β1 = 0.593668 indicates that if the spendable income variable increases by one unit, non-food consumption of rubber farming households in Purwodadi Sub-district will increase by 0.593668 units, assuming other variables such as investment in education are considered constant or fixed. Additionally, given that the variable spendable income is thought of as constant or fixed, β2 = (-1.16E-07) demonstrates that if the

education investment variable increases by one unit, the non-food consumption of rubber farming households in the Purwodadi Sub-district will decrease by -1.16E-07 [10].

5 Conclusion and Recommendation

The variables spendable income and the number of family members positively and significantly affected food consumption expenditure. Meanwhile, the education investment variable did not affect food consumption. The variables of spendable income and educational investment positively and significantly affected non-food consumption expenditure. The coefficient of determination of food consumption expenditure of 60.88% and non-food consumption of 65.89% could be explained by the variables in this model, while other variables outside this research explained the remaining 39.12% and 34.11%. The pattern of household consumption expenditure in rubber farming was more for non-food consumption, i.e., in vehicle fuel and social donations. To raise the productivity of the rubber plantation business and improve the welfare and income of rubber farmer households, it is recommended in this study that the government, entrepreneurs, and rubber farmer households take integrated action. The consumption patterns of rubber farmer households are influenced by the amount of income obtained from rubber cultivation. To improve the quality and quantity of rubber farmers' family consumption, farmers' income sources must be expanded, both from the rubber plantation sector and from other economic sectors. Rubber farmers in Musi Rawas Regency require training to raise the economic value of their production. Rubber farmers also need guidance and assistance to lower production costs and other factors, which can raise processing costs for rubber production and distribution costs.

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