Analysis of Factors Affecting the Household Expenditure of Rubber Farmers in Indonesia

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Abstract: *This study aimed to analyze the factors affecting the household expenditure of the farmers. Primary data collection was randomly carried out from August to October 2017 by interviewing 360 farmers of respondents in 12 villages as representative of Musi Rawas, Muara Enim and Musi Banyuasin regencies in South Sumatra. Data analysis was done using economic analysis and regression. The results showed that household expenditure positively affected household farmers' income, family size and rubber rejuvenation and negatively affected the household savings, formal education and consumption expenditure.*

Index Terms: *Household expenditure, influence, Regression Analysis*

I. INTRODUCTION

Natural rubber plantation in South Sumatera is very strategic and became the main producer of natural rubber in Indonesia with total production of 576,676 ton or 35.66% from Indonesia rubber production in 2015. The contribution of natural rubber to Gross Regional Domestic Product (GRDP) of South Sumatera amounted to IDR 2,861 million or 9.07% of total GRDP and from 62% exported rubber production which was US$ 280.4 million (34%) of the country's foreign exchange of South Sumatra export. In addition, it is also a source of basic needs of life of around 429,846 families or about 2 million people of South Sumatra (Plantation Office of South Sumatra Province, 2016) [1][2].

The local government of South Sumatera has calculated the cost of rejuvenating 100,000 ha of rubber plantations, which is around IDR 776.25 billion. It is programmed for 10 years (2005-2014) (Plantation Office of South Sumatera Province, 2016) [1]. It will be difficult and burdensome if the entire funds are charged to the local government. Therefore, farming needs of the farmers are encouraged more, they are also facilitated to rejuvenate their rubber plants independently. The facilities that can be provided by the local government are partial assistance (rubber plant material), technical guidance and counseling [3]-[6]. So, the role and condition of smallholder rubber plantation can be identified by the formulation of problems faced by smallholder rubber farmers in South Sumatera. What factors affect the household

expenditure of smallholder rubber farmers?

The analysis will be carried out to the factors affecting the household expenditure of smallholder rubber farmers in South Sumatera. It is expected that the research result will be useful to develop a model of estimating non-economic influence in addition to the economy of farmer's household expenditure to meet all of their basic needs of life.

II. LITERATURE REVIEW

The relationship between income and consumption has gained a lot of attention. Nicholson (1995) states that the theory of a Prussian economist Ernst Engel (1821-1896) is still believed to be true to this day. A crucial conclusion from Engel is "the proportion of household income spent on food decreases as income rises". Samuelson and Nordhaus (1986) [7] argue that the pattern of consumer behavior called "Engle's Law" is that if the income increases, the percentage of spending for food will decrease, the percentage of spending on clothing and housing consumption is relatively constant, the percentage of spending on health, education, recreation , luxury goods and savings increasingly higher. Family with the high-income consumes good quality and varied foods. Several studies indicate the need for the development of a household economic model of farmers, not only the economic variable but also non-economic variables that are often more influential in decision making of farmers household. It is assumed that the total farmer's household expenditure is positively affected by total income, the number of family members, the age of the farmer, the consumption, the formal education. Furthermore, the rejuvenation model is negatively affected by household saving [8]-[20].

III. RESEACH MODEL

This research id developed with a scientific approach through deductive and inductive process. The sequence of such scientific approaches is to identify the problems, determine research objective, build hypothesis, design research procedure, analyze the data and information, as well as interpret the data and draw conclusion. This research is still within the scope of agriculture and animal husbandry, as has been done before [21]-[22]. The research sites are selected villages or farmers household in South Sumatera Province. The research area of South Sumatera Province is chosen with the consideration that this province can represent other provinces in Indonesia. Another consideration is because South Sumatra has the widest area of rubber plantation in Indonesia of 27.5% from total area of rubber plantation in Indonesia.

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In addition, South Sumatra is the main producer of rubber in Indonesia amounted to 35.6% of total production. Meanwhile, the time of this research will be conducted from August to October 2017. Sampling used in this research is multi-stage sampling with the quota on the regency, sub-district, and village. The sampling is 6 regencies of main rubber producer namely Musi Rawas, Muara Enim, Musi Banyuasin, Ogan Komering Ulu, Ogan Komering Ilir, and Banyuasin regencies. 3 regencies are selected through purposive sampling which are Musi Rawas, Muara Enim and Musi Banyuasin regencies wuth a plant area of more than 150,000 ha. From each regency, 2 sub-districts are deliberately selected namely Muara Kelingi Subdistrict, and Karyajaya (Musi Rawas Regency), Babat Toman Sub-district, Kerinci River (Musi Banyuasin Regency) and Gelumbang Sub-District and Gunung Megang (Muara Enim Regency). From every sub-district, 2 villages are selected deliberately as the representative with the criteria of the widest rubber area namely Jaya Bakti Village, Karang Sakti Village, Sukaraja Village and Bukit Ulu Village (Musi Rawas Regency), Toman Village, Bangunsarim Tebing Bulang, Kertayu (Musi Banyuasin Regency), and Kelakar Climb, Sukamenang, Parjito and Gunung Megang Luar (Muara Enim Regency). From each village, random samples of 30 farmer samples are collected from the selected sample villages. Quota sample of advanced and traditional farmers is 50% namely 15 advanced farmers and 15 traditional farmers.

We collect the data through direct interview with the sample farmers and in-depth study on the result of data collection. The interview is conducted using a list of questions which contain open and closed questions relating to the variables of cost, income, saving, living necessity and the allocation of the labor of the farmer's family. Data processing uses SAS computer software tools. The data collected from the survey is processed using the procedure for the formulation of the hypothesis that has been previously formulated. Tabulation of data is processed using Excel program. Hypothesis testing is done by regression analysis of economistic estimation model to estimate factors influencing household expenditure of the farmers. Regression analysis carried out to see the determinant produces the following predictor function:

$$Ct = b_o + b_1Yt\neg + b_2Jk - b_3Us - b_4Cc - b_5Tr - b_6Pd + b_7D + e$$

Farmer household expenditures are allegedly affected positively by household income of the farmers (Yt), number of family (Jk), rejuvenation of rubber (D) and negatively affected by age of farmer (Us), expenditure of basic needs (Cc), formal education (Pd) and household saving (Tr).

IV. RESULT AND DISCUSSION

Regression analysis to see the determinant produces the following predictor function:

$$Ct = 1197 + 1,01Yt + 4,05Jk - 0,06Us - 0,01Cc - 1,0Tr - 0,66\ Pd + 1,49\ D$$

Based on the estimation function, coefficient of determination ($R2$) equal to 0.99 is obtained with the value of Fcount bigger than Ftable. Thus, the variation of exogenous variable can explain the variation of endogenous variable at 95% confidence level. Parameter estimating of household saving (Tr), age of farmer (Us), consumption of basic needs (Cc) and formal education (Pd) is negative. Meanwhile, the parameter estimator of farmer household income (Yt), number of family (Jk), and rejuvenation rubber (D) is marked as positive. The parameter marks of these variables do not match the expected sign of the age of the farmer (Us), the consumption of basic needs (Cc) and formal education (Pd). The second analysis is carried out to see the influence of each exogenous variable partially which produces numbers presented in Table 1.

Table 1 The result of Determinant Analysis from Household Expenditure of the Farmers

No	Variable	Regression Coefficient	Parameter Value	t't_count	Significant
1	Intercept	b_0	1197	78.6	0.0001
2	Y_t	b_1	1.01 **	381.6	0.0001
3	J_k	b_2	4.05 **	1.022	0.3072
4	U_s	b_3	- 0.06	0.229	0.8187
5	C_c	b_4	- 0.006 *	1.333	0.1833
6	T_r	b_5	- 1.004 **	343.1	0.0001
7	P_d	b_6	- 0.66 *	1.153	0.2497
8	D	b_7	1.496 **	0.308	0.7584

Note: * Real effect on confidence level 95%
** Real effect on confidence level 99%

Table 1 shows that overall exogenous variables have significant and real effect on the household expenditure (Ct) except age of the farmers (Us), consumption of basic needs (Ct) and formal education (Pd). It can be specifically explained that:

1. Farmers household income (Yt) has a positive and very significant effect on the household expenditure (Ct), with the parameter value of 1.01. This means that total income (Yt) determines the rise or fall more in the direction of household consumption of farmers (Ct) of 1.01. The greater the income the greater the desire to consume.

2. Household saving (Tr) has a very negative and real effect on the farmers household expenditure (Ct), with the estimator parameter value of - 1.04. This means that household saving (Tr) predominantly determines the rise and fall in opposite direction of the household consumption of farmers (Ct) amounted to - 1.04. The greater the household saving will result in reducing the expenditure of farmers household both for consumption expenditure or other expenses.

3. Age of farmers (Us) does not affect the expenditure of farmers household (Ct) with estimator parameter value of – 0.06. This means that the age of the farmer has no impact on the farmers household expenditure. It can be seen from the empirical data where the farmers household expenditure is not proportional to the increasing age of farmers. However, it is indicated more by the social status of the community.

4. Consumption of basic needs (Cc) has a negative and real effect on the farmers household expenditure (Ct) with parameter value of – 0.006. This means that the consumption of basic needs affects the expenditure of farmers household. It can be seen from the empirical data where the consumption of basic needs determines the rise and fall in opposite direction to the farmers household expenditure.

5. The number of family (Jk) has a positive and very significant effect on the farmers household expenditure (Ct) with the estimator parameter value of 4.05. This means that the number of households (Jk) determines more on the rise or fall in line with the household expenditure amounted to 4.05. This can be understood because more family members are increasing the farmers household expenditure, especially for the daily needs of each individual in the family.

6. Formal education (Pd) has a negative and real effect on the farmers household expenditure (Ct) with the estimator parameter value of – 0.66. This means that formal education affects the farmers household expenditure. This evidence suggests that the level of education undertaken by farmers will affect farmers to increase or decrease household expenditures in opposite directions.

7. Rubber rejuvenation (D) has a positive and very significant effect on the farmers household expenditure (Ct) with estimator parameter value of 1.496. This means that the rejuvenation of rubber determines the rise or fall in line with the household expenditure amounted to 1.496. This can be understood because t rejuvenation requires cost for superior clone plant material.

V. CONCLUSION

Based on the results of analysis and discussion on the factors affecting the smallholder rubber farmers household expenditure, it can be concluded that some of the factors affecting household expenditures are significantly and positively affected by the household income of farmers, number of families and rejuvenation of rubber and it will be negatively influenced by household saving, formal education and consumption expenditure of basic needs and age of the farmers. In the effort to empower household economics of sustainable farmers, the researcher advises the following policies:

1. The development of business diversification and utilization of intercropping plants. Improvement of technical capability of rubber farmers and productivity improvement in accordance with the potential through the use of superior seeds and technical recommendations of relevant institution.

2. Providing capital loan assistance for procurement of recommended technology package through credit with land certificate guarantee. Counseling and fostering of farmers' financial institutions to collect potential savings funds to cover the investment cost of rejuvenating their rubber plantations during their economic phase. Macro policy of economic development in favor of the farmers with regard to trade, price, fiscal, monetary and investment policies.

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