(RESEARCH ARTICLE)

Analysis of factors that influence the food security of rubberfarming households in Musi Rawas regency

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Abstract

The study aims to (1) analyze the income and consumption values of rubber farming family households in Musi Rawas Regency, (2) analyze food security and the factors that influence the foodsecurity of rubber farming family households in Musi Rawas Regency. The research was conducted in Lubuk Rumbai Village and Jaya Bakti Village with a sample of 100 rubber farmers registered as underprivileged families. The research results show that income House ladder farmers in Musi Rawas Regency that is source income farming rubber amounting to Rp. 77,280,000 per month (49%), source income farming other amounting to IDR 2,300,000 per month (21%) and source non- farm income amounting to IDR 3,300,000 per month (30%). As for the size expenditure food costs an average of IDR 565.950 and non- food expenses IDR 402.506 per month. The magnitude proportionexpenditure food to total spending respondent is expenditure food by 58,44% and non- food expenditure by 41,56% with House ladder as many as 100 respondents. According to category resilience food respondents in the District of Tuah Negeri stated vulnerable food if proportion expenditure food is at above 60% meanwhile below 60% stated vulnerable food. F influencing factors _ real to resilience food in Tuah Negeri District includes income House ladder farmers and production For food House ladder farmer rubber.

Keywords: Food security; Food consumption; Income; Rubber farmers

1. Introduction

Rubber is plant many plantations developed by the people of South Sumatra and became commodity main economy national. Rubber is commodity superior who has very strategic value in support farmers income rubber moment this. Plant rubber in Indonesia is classified as fertile with areas located on the plains high climate tropical. Hence the plant rubber lots developed by Indonesian people, and plants rubber the is one source riches nature has Indonesian nation. Rubber becomes commodity national in scope plantations with great potential for Indonesian nation. As it develops time plantation rubber the more Lots developed in various regions in Indonesia a [1].

Rubber prices experience fluctuation Where price rubber moment This is Rp. 7.000 [2]. Rubber prices are experiencing fluctuation cause income public become no stable. Influence on level income farmer rubber, where level income is one indicator for increase well being house ladder farmer. Income will compared straight with well-being house ladder farmer. Income house ladder farmer is the total sum from various source generated income in one family, inside study this income house sourced stairs from farming rubber capable fulfil his needs. Income house the stairs really matter consumption, consumption is also influenced by income, if income increase so consumption will also be carried out increases, and vice versa [3].

Income will influence many goods consumed, often found with increase income, then goods consumed no just increase, but also quality goods the follow become attention, meaning can influence quality and welfare community. Welfare is something condition where people can fulfil need and can related with environment in a manner ok. Social activities are defined as something condition life individuals and society accordingly with eligibility standards live.

Based on score index resilience food condition resilience food in South Sumatra currently this Not yet reach 100% because still there is indicated areas public pre prosperous. Underprivileged society is experiencing community difficulty for fulfil need base his life, especially food. resilience food defined as situation where all people, every time own access physical, social and economic to sufficient, safe and nutritious food for fulfil need the food as well as preference food for active and healthy life. Dimensions resilience food consists from four category , ie availability food, access to food, utilization food, as well stability or ability house ladder for withhold risks and shocks that erode one from three dimensions other [4].

South Sumatra is area plantation rubber the biggest in Indonesia. According to the central statistics agency, South Sumatra occupies area producer rubber with estimate from government. A number of province dominate production rubber in Indonesia in 2021. South Sumatra occupies massage top as area producer rubber with estimate up to 870,966 tonnes. According to [5] wide plantation rubber in South Sumatra reached 872.5 thousand hectare. Plantation area rubber largest in Indonesia general headquartered in South Sumatra and Kalimantan. Plantation area rubber in Sumatra reached2.57 million hectares, while Kalimantan reached 963.3 thousand hectare.

Potency plantation area and yields enough production big assumed as a region with majority gardening residents. Potency the area of plantations in Lubuk Village Rumbai and Jaya Bakti Village, Musi Rawas District can be good example in analyze balance between fulfillment need food public to income majority society _ Still depend on plantation. Condition food and non- food Villagers of Lubuk Village The majority tassel gardening rubber naturally become something interesting thing for studied more further, whether has in accordance with durability standards food in Indonesia.

2. Material and methods

This Study conducted in Lubuk Village Rumbai and Jaya Bakti Village. The object of research is the underprivileged rubber farmers. The research method used in this study is a survey method. Determination of respondents using the Proportional Random Sampling method. According to [6] Proportional Random Sampling is a method that is used by determining respondents by paying attention to the proportion of each sub-population or the group it represents and sampling from each sub-population is carried out randomly. The total population in this study was 1,381. A sample of 100 farmers consists of 50 samples in Lubuk Rumbai Village and 50 samples in Jaya Bakti Village

Household income grouped become income work and non- work income. Income Work disaggregated become work income (husband), and members House ladder (wife and children) who come from from farming rubber, farming others, and nonagricultural. S meanwhile non work income consists from income head house ladder and member resulting family from no work like rental tools, land, and inheritance.

To answer the first research objective, namely analyzing the income p value and household consumption of rubber farming families in Musi Rawas Regency was analyzed using income analysis. Calculation structure income house ladder refers to analysis income by [7] so can formulated analysis income House ladder farmer rubber in Musi Rawas Regency as following:

$$Yrt = Y1 + Y2 \quad Yrt = (A1 + A2 + A3) + (B1)$$

Information:
Yrt = Income household (Rp/ month) Y1 = Income work (Rp/ month)
Y2 = Non- work income (Rp/ month)
A1 = Income farming rubber (Rp/ month)
A2 = Income farming others (Rp/ month)
A3 = Non- agricultural income (Rp/ month)
B1 = non- work income (Rp/ month)

Consumption household in study this defined as proportion expenditure house allocated stairs for need food and non food were analyzed using descriptive analysis. For need analysis descriptive, grouping house ladder based on expenditure refers to the grouping performed by [8].

Low, if the expenditure is average household equivalent (XR): (Xir) < (X^- – Sd) or Xir < 60%.

High, if the average expenditure household (XT): Xit ≥ (¯ + Sd) or Xit ≥ 60%.

Answering the second objective, namely analyzing food security and the factors that influence the food security of rubber farming families in Musi Rawas Regency, were analyzed using multiple linear regression with the help of SPSS. These factors in this research are age , education , income , number member family , and expenses For food consumption using the formula:

$$Y = \alpha + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5 + X5u$$

Information:
Y   = Food and Non-Food Expenditures (Rupiah/Month)
A   = intercept
β1 – β5 = Coefficient
X1   = Age Head House ladder (Year)
X2   = Length of Head's Education House ladder (Year)
X3   = Income (Rupiah/ month)
X4   = Total member family
X5   = Household expenses (Rupiah/ month)
 U   = Error bully

3. Results and discussion

3.1. Respondent Farmer Household Income

Income is income arising in implementation activity familiar and familiar entity with designation different like sales, consideration, interest, dividends, royalties and rent [9].

Income farming is income respondents obtained from results sap rubber during One month. As for income outside farming is income from work besides farming rubber. Following is table 1 about income house ladder respondent based on source income in Musi Rawas Regency.

Table 1 Average Household Income _ Respondent Based on Source Income

Source of Income	Average Income(Rp/Month)	Percentage (%)
Rubber Farming	77 2,800	49.00
Other Farming Businesses	328,571	21.00
Non- Agricultural	471,429	30.00
Amount	1,572,800	100.00

Source: Results of Primary Data Processing, 2023

Average p income House ladder farmer that is source income farming rubber amounting to Rp. 772,800 per month with percentage 49%, average income farming others amounting to IDR 328,571per month with percentage of 21% and an average non- agricultural income of Rp. 471,429 with working percentage of 30%. as employee private, labor factories , workers building and trading in the market as well stall. this showing that income farmers in Tuah Negeri District, percentage farming rubber more big from farming other and non agricultural Because farmer more focus on activities his farming business.

incurred for need all member House stairs. According to [11] Expenditure household depends from a number of matter namely : level Expenditure house ladder is costs income , amount member family level price needs, education and needs social. Expenditure house ladder shared be two ie expenditure food and non food production. High income inclined will happen change expenditure consumption will various. Expenditure consumption household is possible indicator describe well being society. The more tall income so portion expenditure will shift from expenditure food to nonfood expenditure. On the contrary If income low so portion expenditure food tall from non food expenditure. The following is table 2 regarding the average monthly food expenditure of respondent households.

Table 2 Average Household Food Expenditures Per Month Respondent

No	Food Expenditures	Average (Rp/Month)	Percentage (%)
1.	Grains	265,815.00	46.97
2.	tubers	6,108.00	1.08
3.	food animal	130,823.00	23.12
4.	vegetables	45,747.00	8.08
5.	nuts	30,234,00	5.34
6.	fruits	29,659.00	5.24
7.	oil and fat	41,130.00	7.27
8.	drink	5,508.00	0.97
9.	spices	5,626.00	0.99
10.	consumption other	5,300.00	0.94
	Amount	565,950.00	100.00

Source: Results of Primary Data Processing, 2023

Expenditure grains is expenditure biggest ie 46,97% of whole expenditure For consumption food. Group food paddy that is rice, corn, flour rice, flour corn, flour flour and type product from grains. The magnitude expenditure For paddy grain because paddy / rice is food tree for every house ladder respondent. This also affects pattern food public for sufficient need rice as most important needs, so rice occupy the largest order among group food other. Apart from rice There is flour flour is also one consumption food from group grains. Flour flour is used For material maker side dish pauk or food light.

The second largest food expenditure is for animal food at 23,12%. Animal food groups include fish, chicken, beef, eggs and milk. Consumption of fish and meat is only 1 or 2 a week or not at all so they are combined into animal food. On average, respondents consumed chicken and eggs more often, so the largest percentage was in the chicken and egg meat group.

he smallest food expenditure is for other consumption groups at 0.94%. Other consumption groups include crackers, noodles, vermicelli, and others. Noodle consumption is the largest expenditure in this group. Noodles are an alternative to fulfill needs other than rice compared to other foods. However, the nature of the carbohydrates in noodles is different from rice, which is a complex carbohydrate that keeps you full longer than instant noodles, so it can give you the effect of feeling hungry faster than rice.

Table 3 Average Non-Food Expenditures Per Month for Households Respondent

No	Non-Food Expenditures	Average (Rp/Month)	Percentage (%)
1.	Electricity	105,430	26.19
2.	Water	27,133	6.74
3.	Education	76,853	19.09
4.	Health	131,400	32.65
5.	Gas	61,690	15.33
6.	Housing area	-	0.00
Amount		402,506	100.00

Source: Primary Data Processing Results, 2023

Average monthly non-food expenditure of respondent households. The largest non-food expenditure is expenditure on health, namely IDR 131,400 with a percentage of 32.65%. Health expenditure is expenditure to pay BPJS contributions,

but of the 100 households on average receiving KIS assistance, only a few pay contributions independently. School children's tuition fees are paid every month. Non-food expenditure for electricity was IDR 105,430 with a percentage of 26.19%. Electricity costs are used every day for lighting and electronic equipment at home. Electricity costs are one of the largest costs of total non-food expenditure.

Non-food expenditure for education is IDR 76,853 with a percentage of 19.09%. Expenditures for education are expenses to pay school fees for school children, fees that are paid every month. Non-food expenditure for gas was IDR 61,690 with a percentage of 15.33%. Gas costs are used every day for cooking and food purposes. Gas in Musi Rawas Regency is natural gas which is paid every month so that people in Musi Rawas Regency do not buy LPG gas for cooking needs.

Non-food expenditure for housing is IDR 0 with a percentage of 0%, because people in Tuah Negeri District live in their own homes, even though they have a family, on average they still have their parents with them, which is why the average number of dependents in a household reaches 5-6 people in one house. Expenditures incurred by respondent households on food expenditures and non-food expenditures. Respondents' total household expenditure can be seen in Table 4.

Table 4 Average Household Expenditures _ Respondent

Expenditure	Amount (Rp/Month)	Percentage (%)
Food Expenditures	565,950	58.44
Non-Food Expenditures	402,506	41.56
Amount	968,456	100.00

Source: Primary Data Processing Results, 2023

he average total expenditure is IDR 968,456 per month, consisting of food expenditure of IDR 565,950 and non-food expenditure of IDR 402,506 per month. From this explanation, it can be seen that food expenditure is greater than non-food expenditure.

The proportion of food consumption expenditure is the percentage of food expenditure compared to the average total expenditure. Average total expenditure is the average food consumption expenditure and the average non-food expenditure added together. The average amount of total expenditure in this study was IDR 968,456. Based on table 4, the average food expenditure is IDR 565,950 or reaches 58.44% of the total average expenditure and the average non-food expenditure is IDR 402,506 or reaches 41.56% of the average total expenditure. The result of the food calculation is more than greater than non-food so that the level of welfare of respondents' households in Tuah Negeri District, food expenditure takes up more than a large share of household expenditure, this means that the level of welfare of respondents' households is still low. The higher the proportion of food expenditure means the lower the level of household welfare.

According to [12] House ladder with level high welfare, will capable sufficient need will food and non- food. this as applies to Engel 's law, that proportion of total spending allocated For interest food will reduce with increasing income. Additionally, with increase his income, house ladder can buy more food good from facet nutritional and not focus will interest For overcoming hunger, but also fulfillingneed nutrition member house ladder respondent.

3.2. Household Food Security

Resilience food can is known from availability, distribution and consumption public to food. On research this resilience food seen from side proportion expenditure food. Proportion expenditure food is component for determine resilience food House stairs. resilience food respondent can seen in Table 5.

Table 5 Proportion of Food Expenditure

Proportion Food Production	
Low (≤ 60% Food Expenditure) 1. Food Resistant	High (≥60% Food Expenditure) 2.Food Insecurity

Source: Results of Primary Data Processing, 2023

R respondent House ladder farmer rubber in study status vulnerable food that has amount by 70% with House ladder A total of 100 respondents were obtained from results table 4 and according category resilience food in the table above stated vulnerable food if proportion expenditure food How many above 60% meanwhile below 60% stated vulnerable food. [13] indicators of household income and nutritional consumption to measure the degree of household resilience. In this case, the two researchers used indicators of the share of food expenditure and adequacy of energy consumption to measure the degree of household food security. A household is categorized as food secure if it has a low share of food expenditure (less than 60% of household expenditure) and consumes enough energy (> 80% of energy adequacy requirements). Food vulnerable households are defined as households that have a high share of food expenditure (> 60% of household expenditure) but consume sufficient energy; a household lacks food if it has a low share of food expenditure and less energy consumption (< 80% of the adequacy requirement). Meanwhile, a household is categorized as food insecure if it has a high share of food expenditure and low levels of energy consumption.

Analysis influencing factors _ resilience food House ladder farmer done use analysis Multiple Linear Regression with use variable dependent (Y) ie proportion expenditure food and non- food House stairs and 5 variables independent (X) ie Age Head Family (X1), Head's Education Level Family (X2), Farming Income (X3), Total Member Family (X4), Household Expenses (X5). According to [14] that the factors that affect household food security are family income, number of family members, level of education, and age. Analysis results influencing factors resilience food House ladder farmer can seen in the table 6 follows.

Table 6 Regression Results

Variable	Regression coefficient	t	Sig.
(Constant)	1,527	3,988	0.000
Usia (X_1)	0,015	0,487	0.628
Lama Pendidikan (X_2)	0,017	0,852	0.397
Pendapatan (X_3)	-0,052	-2,742	0.007
Jumlah Anggota Keluarga (X_4)	0,260	11,146	0.000
Pengeluaran Rumah Tangga (X_5)	-0,117	-3,862	0.000
Adjusted R2			0.593
F Hitung			27.354
F Sig.			0.000

Source: Results of Primary Data Processing, 2023

The value of the coefficient of determination (Adjusted R2) from the regression model used as can be seen in the table is 0.593 or 59.03%, which means that the variables age of the head of the family, education level of the head of the family, income, number of family members, expenditure on food have an influence and can explain the proportion of household food expenditure of 59.03% while the remaining 40.97% is explained by other variables not included in the model studied.

The results of the partial test (t-test) can be seen in the significance of each independent variable which is presented in the table. If the significance value of t is <0.1 then the independent variable partially influences the dependent variable.

Based on the test results obtained, it is known that the significance value of the variables income (0.007), number of family members (0.000) and household expenditure (0.000) is still lower than 0.1 so that these three variables have an effect on food security as seen based on the proportion of food expenditure household. [15] in their research stated that households with high income levels will allocate more of their income to food expenditures in relatively fixed amounts accompanied by improvements in the quality of food consumed and allocating excess funds to non-food expenditures. This means that income has a significant effect on the proportion of household food expenditure, where if there is an increase in income, the proportion of household food expenditure will decrease because more income is allocated to non-food expenditure. The proportion of food expenditure is obtained by dividing the total food expenditure by total household expenditure so that the higher the expenditure on providing food for the household, the higher the proportion of food expenditure and the more food insecure the household is.

4. Conclusion

The results of the research carried out can be concluded that: 1) Income House ladder farmers in Musi Rawas Regency Tuah Negeri District , namely source income farming rubber average Rp. 77,280,000 per month (49%), source income farming other amounting to IDR 2,300,000 per month (21%) and source non- farm income amounting to IDR 3,300,000 per month (30%). As for the magnitude expenditure food costs an average of IDR 565,950 and non- food expenses amounting to IDR 402.506 per month. 2) Magnitude proportion expenditure food to total expenditure respondent is expenditure food by 58,44% and non- food expenditure by 41,56% with House ladder as many as 100 respondents. According to category resilience food respondents in Musi Rawas Regency stated vulnerable food if proportion expenditure food is at above 60% meanwhile below 60% stated vulnerable food. Influencing factors _ _ real to resilience food in Musi Rawas Regency covers income House ladder farmers and production For food House ladder farmer rubber.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

This research work does not contain any research conducted on animal/human subjects by any of the authors. Statement of informed consent Informed consent was obtained from all participants included in this study.

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