VARIOUS PROBLEMS OF FARMERS AND FACTORS INFLUENCING THEIR DECISIONS TO CONVERT RUBBER PLANTS INTO OIL PALM IN MAUR BARU VILLAGE OF RUPIT DISTRICT, MURATARA REGENCY, INDONESIA

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ABSTRACT

The objectives of this study are to identify the factors that influence the decision of rubber farmers to convert rubber plants to oil palm which consists of internal factors including plant age (years), land area (ha), number of dependents (org), and external factors include the distance from home to land (km), marketing channels, selling price (Rp/kg); The method used in this study was the survey method. The sampling method used in this randomized uneven study with a sample of 21 farmers who did not convert plants (rubber farmers) and 21 farmers who converted (oil palm farmers). The results of this research used the Binary logistic data processing method and showed that the factors that significantly affected farmers' decisions in converting rubber crops to oil palm were plant age, land area, number of dependents, and gap distance, while those that did not significantly affect the marketing channel. These results indicate that internal factors are more significantly influential than external factors in the decision-making of farmers to convert rubber plants to oil palms. The results of the t-test analysis indicate that t_{count} 27,581> t_{table} 2,021, which means rejecting H0 or there is a significant difference in income, between the income of farmers who convert crops (oil palm farmers) is greater than farmers who do not convert crops (rubber farmer) with the difference in an average income of Rp 8,925,519/ha/year.

KEY WORDS
Conversion plant, rubber plants, oil palm plants.

The potential and availability of land resources for agriculture are still quite extensive, but in the future, it is predicted that there will be competition for the use of one of them in the plantation subsector, especially the conversion of agricultural land (Hidayat, 2009). Based on data from the South Sumatra Plantation Service (2021) in the Strategic Plan (2013–2018), South Sumatra is a province with a majority of the population of more than 1.3 million households or around 4.2 million residents whose sources of income are from the plantation sub-sector. on oil palm and rubber commodities. With this, the development of the plantation area of South Sumatra Province has increased during the 2009-2021 period, especially in the oil palm commodity which increases every year. In line with the increase in area and other measures, the production of plantation products will be targeted to increase by 3.78 million tons in 2021, driven by palm oil production of 2.30 million tons and rubber production of 1.27 million tons. Changes in land area and increased production are prioritized for oil palm commodities because rubber commodities are experiencing problems.

The main problem with rubber commodities is that the price of rubber is unstable and dominantly low, due to the very fast development of rubber so there is an excess of production compared to the world's rubber needs (Subandi, 2017). Besides that, According to (Syakir et al., 2010), stated that the problem of rubber plants in Indonesia is due to the low technology of processing the results which are backward so that the productivity and quality of the rubber produced are low. This happens because the potential of the palm oil market is guaranteed, while the rubber commodity is facing a monopsony market which reduces the interest in cultivating rubber plants and encourages rubber farmers to convert rubber plants into oil palm plants to meet the increasing needs of life.

Land function conversion or land conversion is no longer only felt in big cities, what is happening now is that land conversion has been felt in rural areas, one of which is Maur

Baru Village, Rupit District. The phenomenon that is currently happening in Maur Baru Village is a change in the land, namely farmers who convert rubber plantations to oil palm land, which is because the income from rubber farming is deemed insufficient to meet the needs of their families. Based on this description, researchers are interested in identifying the problems and factors that influence farmers' decisions to convert rubber to oil palm in Maur Baru Village, Rupit District, Muratara Regency.

METHODS OF RESEARCH

This research was conducted in Maur Baru Village, Rupit District, Muratara Regency. The location of this research was chosen intentionally (purposive sampling) by considering that Maur Baru Village is one of the villages whose livelihoods are plantation crop farmers. What is currently happening is that some rubber farmers in Maur Baru Village are converting their rubber plantations to oil palms. Data collection in the field has been carried out from November 2021 until it is completed. The sampling techniques used is convenience sampling, where the sample farmers have taken are farmers who can be found. Based on the data above, it can be seen that the total population in this study amounted to 595 people and the precision was determined or the significance level was 15%, so that each farmer who converts is 21 people and does not convert is 21 people. The sample size in this study was determined using the Slovin formula, namely:

$$n = \frac{N}{1} + Ne^2 = \frac{595}{1 + 595.\,0,0225} = \frac{595}{14,38} = 41,38 \text{ be rounded } 42$$

Based on Kencana's research (2017), the factors that influence farmers' decisions to convert rubber plants to pepper and chili plants consist of internal factors including the number of dependents, farmer experience, land area, and external factors, namely selling price, and production costs. Wahyudi's research (2014) shows that the income of oil palm farming is Rp105,982,309/year, while the income of rubber farming is Rp52,478,251/year. Thus, oil palm farming is more profitable than rubber farming. Based on the description above regarding the results of previous research, it can be obtained the hypothesis used in this study, namely: It is suspected that there are internal and external factors that influence the decision of farmers to convert rubber plants to oil palm, namely the age of the plant (years).

The data processing method is carried out using a computer program, *namely Statistical Program and Service Solution* and *Microsoft Office Excel.* To answer the purpose of this study, which is to identify the factors that influence the decision of rubber farmers to convert rubber plants to oil palm, will be answered using *Binary Logistic Regression* (logit) analysis. The ARL equation is used to determine the factors that influence the decision of farmers to convert rubber plants into oil palm at the farmer level, the general form of the logistic regression model is:

$$Zi = ln\left|\frac{Pi}{1 - Pi}\right| = \alpha_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 D1 + \beta_6 X5 + u$$

Where:

Zi = Probability of crop conversion (0< Pi <1);
Pi (1) = 1 Doing crop conversion;
Pi (0) = 0 Do not convert crops;
α_0 = Intercept coefficient;
$\beta 1 \ldots \beta n$ = Regression Coefficient;
$X1 \ldots Xn$ = Factors that are thought to influence farmers' decisions to convert crops;
X1 = Plant Age (years);
X2 = Land Area (Ha);
X3 = Number of Dependents (person);

X4 = Distance of the market;

D1 = Marketing Channel D1= 0: indirect and D1= 1: direct;

X5 = PriceSell (Rp);

U = Disturbance/Residual,

The criteria for acceptance or rejection of the above hypothesis are based on the results of the significance of Pi or (P-Value-i).

The decision rules are as follows:

- If the significance level > 0.10 H_0 is accepted, it means that there is no effect of each independent variable on the dependent variable;
- If the significance level <0.10 H_0 is rejected, it means that there is an effect of each independent variable on the dependent variable.

RESULTS OF STUDY

Of a total of 700 farmers around 560 farmers whose main livelihood is rubber farmers, but currently, rubber farmers in Maur Baru Village are experiencing problems. The problems of farmers seen from the conditions in the field are:

- Low Rubber Prices. The price of rubber in Maur Baru Village in this study was Rp4500-5500/kg, due to the low price of rubber; rubber farmers reduced variable costs such as the use of fertilizers and thickening fluids for rubber freezers. The existence of this reduction makes the selling price of rubber plants lower;
- Old, Damaged, and Diseased Rubber Plants. One of the reasons farmers converting rubber plantations into oil palms in Maur Baru Village is due to old, damaged, and diseased rubber plants. For more details, it can be seen in Table 1, namely:

Table 1 – Problems faced by Example Farmers in Rubber Farming

Problem	Example Farmer (Person)	Percentage (%)
Old Rubber	10	47.62
Damage Rubber	8	38.09
Rubber Affected by Disease	3	14.29
Amount	21	100.00

Source: Farmers Example of Maur Baru Village, 2021.

Based on Table 1, the main problem of rubber sample farmers converting rubber plants into oil palm is caused by the age of the old rubber plants, as many as 10 farmers out of 21 sample farmers. Old rubber plants can affect the latex production of rubber plants.

The rainfall in Maur Baru Village is quite high, which makes rubber farmers feel confused and disadvantaged. Rubber farmers complain that if it rains the tapped rubber plants mix with water so that the rubber produced is not of good quality which is can affect the selling price of the rubber itself, plus frequent floods if the intensity of the rain is very high or for days due to the rubber plantations of farmers in the village. Maur is mostly located across the river.

The process of converting rubber plantations to oil palms occurred before Musi Rawas Utara became a New Autonomous Region (DOB) in 2013. So that the conversion of rubber plantations to oil palm in Muratara Regency, especially Maur Baru Village, occurred about 13 years ago. To avoid losses, farmers carry out rejuvenation activities or replace them with other plants that more profitable plants. Substitution with other plantation crops is also part of the strategy undertaken to minimize the risk of loss. The opening of new oil palm plantations from the conversion of rubber plantations certainly requires large capital for initial investment, therefore the sample farmers convert their crops with 3 different processes as follows.

Based on Table 2, it can be seen that the most direct crop conversion process was carried out by sample farmers, namely 11 people. Farmers who convert directly are farmers who have sufficient capital, have other jobs besides farming or have more than one land so that the other land can still produce.

Table 2 – Crop Conversion Process

No	Conversion Process	Example Farmer (person)	Percentage (%)
1.	Directly	11	52.38
2.	Insert	7	33.33
3.	Gradually	3	14.29
Amount		21	100

Source: Farmers Example of Maur Baru Village, 2021.

Based on field identification it is known factors that are thought to influence farmers' decisions are internal factors including plant age (years), land area (ha), number of dependents (person), and external factors including land distance, marketing channels, and selling prices. Furthermore, to see the factors that significantly influence the decision of the sample farmers not to carry out and convert rubber to oil palm, it can be seen in the results of the Binary Logistic Regression analysis.

Table 3 – Binary Logistics Regression Output

Variable	Parameter Alleged(B)	Score Wald	Sig	Exp (B)
Plant Age (X1)	0.576	4,902	0.027*	1,769
Land Area (X2)	-4,108	3,174	0.075*	0.16
Number of Dependents (X3)	1.364	5,100	0.024*	3,912
Fatigue Distance (X4)	0.976	3,254	0.071*	2,648
Marketing Channels (X5)	1.217	0.837	0.360	3,376
Constant	-11,690	4,848	0.028	0.000
$R^2 = 0,774$ $\chi^2_{count}= 58.224$ df = 6, sig = 0.0000				

Source: Primary Data (processed data), 2021.

Based on Table 3. above, the results of the Binary Logistic Regression analysis show the coefficient of determination (R^2) obtained is 0.774. This shows that 77.4 percent means that the variety of factors that influence farmers' decisions to not convert crops and convert rubber to oil palm in Maur Baru Village can be explained by internal factors (plant age, land area, and the number of dependents) and external factors (farm distance, marketing channel, and selling price). The value of χ^2_{count} is 58.224, which is greater than $\chi^2_{0,05(6)}$ of 12.592. It means that H0 is rejected, which is proven that the six variables influence together to explain farmers' decisions in converting crops in Maur Baru Village. After a partial wald test, it can be seen that four variables have a significant effect on farmers' decisions in converting rubber plants to oil palm in Maur Baru Village, namely internal factors (plant age, land area, number of dependents) and external factors (land distance) with a test level of 10 percent. While the variables that have no significant effect or > 10 percent are the marketing channel variables.

Internal Factors Affecting Farmers Converting Land from Rubber Commodities to Palm Oil. The results of the logistic regression analysis method showed that the estimated parameter 0.576 was positive (+), meaning that the plant age variable had a positive effect on the dependent variable, with an odds ratio value of 1.769, farmers who had a plant age one year older had a 1.769 greater chance of converting crops rubber into oil palm compared to farmers who have a rubber plant age one year younger. The significant value for the plant age variable is 0.027 < 0.10, meaning that the plant age variable has a significant effect in making decisions to convert rubber plants to oil palms. Plant age shows productivity in producing farm products. The older the age of the rubber plant, the lower the quality of rubber and latex production which can affect the selling price.

The variable land area of the sample farmers in this study has an estimated parameter value of -4.108 with a negative sign (-) meaning that the variable land area of the sample farmers harms the dependent variable, with an odds ratio value of 0.16. So that farmers with a land area of one hectare larger have a 0.16 chance of converting rubber into oil palm compared to farmers with a land area of one hectare lower. The significant value for the land area variable is 0.075 < 0.10, meaning that the land area variable has a significant effect on farmers' decision-making to convert crops. The data in the field shows that on average,

farmers who have a larger land area decide to maintain their rubber plantations, while farmers who have a smaller land area prefer to convert their rubber plantations into oil palms. Rubber farmers who have a larger land area think that if they convert their rubber plantations to oil palm, they think about the production costs or capital that will be spent to replace their rubber plantations.

Prediction parameter analysis results1.364positive sign (+) means that the variable number of dependents of the sample farmers has a positive effect on the dependent variable with an odds ratio value 3,912 then the farmer with a larger number of dependents has a 3,912 greater chance of converting his rubber plantations to oil palm than the farmer with one lower number of dependents. Judging from the significant test of 0.024 < 0.10, it means that the variable number of dependents has a significant effect on making decisions to convert rubber plantations into oil palm. In general, the more the number of dependents in the family, the more the needs of the family must be met. The data obtained in the field also shows that farmers who have family members belonging to a large number of ≥2 on average convert their rubber plantations to oil palm because the income of rubber farming cannot meet the increasing needs of the day.

External Factors Affecting Farmers Converting Land from Rubber Commodities to Palm Oil. Prediction parameter analysis results 0.974 a positive sign (+) means that the distance variable from the house to the sample farmer's land has a positive effect on the dependent variable with an odds ratio value 2.648 so that farmers who have a further distance from their house to land have a 2.648 greater chance of converting rubber into oil palm than farmers whose distance from house to land is closer with a significant test value of 0.071 > 0.10, meaning that the distance to land variable has an effect significantly in the decision making of farmers to convert crops. The farther the distance from the house to the land, the farmers need to make more sacrifices in managing the land, such as the time and cost of traveling to larger fields. Field data show that farmers who have a distance of more than 1.8 km from their house to land decide to convert their rubber plantations to oil palm.

The results of the analysis of the suspected parameter 1.217 are positive (+) which means that the sample farmer's marketing channel variable has a positive effect on the dependent variable with an odds ratio of 3.376, farmers who choose indirect marketing channels to have a 3.376 greater chance of converting rubber plants than farmers who choose direct marketing channels. The value of the marketing channel significance test is 0.360 > 0.10 This means that the marketing channel variable has no significant effect on farmers' decision-making to convert rubber plantations to oil palm.

In this case, the author does not include the selling price unit in the Binary Logistics Regression because the unit comparison is very significant, and this factor also does not fill the dummy requirements or on the rank scale. At the time of the research, this indicator was not eliminated as one of the factors that affected farmers' conversion because the field sample stated that the reason why farmers decided to convert rubber to oil palm was the difference in the selling price of the commodity on the market. The selling price is one of the reasons farmers decide to convert their rubber plantations to oil palm. Data in the field shows that the selling price of rubber has decreased. When viewed from the rupiah value, the selling price of rubber looks higher than the price of palm oil. but if you look at the results of production, of course, the yield of palm oil production is higher. If weighed, one bunch of palm fruit is the same as 25 kg of rubber. The selling price of rubber is currently Rp4,500 to Rp5,500 and the price of palm is Rp1,000 to Rp1,500. Although the selling price of palm fruit rises and falls every year, the decline is not too dominant, not the same as the price of rubber which fluctuates every year.

CONCLUSION

Based on the results of the research that has been carried out in the field, data processing, and discussion, it can be concluded from this research that: The factors that significantly influence the farmers' decisions in converting rubber plants to oil palm are plant age, land area, the number of dependents and the distance between them, while the one that

has no significant effect is the marketing channel. So internal factors are significantly more influential than external factors in farmers' decision-making to convert rubber plants to oil palm in Maur Baru Village, Rupit District, Muratara Regency. The suggestions that can be given based on the results of this study are for rubber farmers who are experiencing problems because old rubber plants should convert rubber plants into oil palm because the income of oil palm farmers is greater than the income of rubber farmers so that it can improve the welfare of the community and farmers are expected to know the impact from the activity of converting crops into oil palm seen from the socio-economic conditions.

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