

FACTORS AFFECTING THE TRANSFER OF FUNCTION OF PEOPLE'S RUBBER PLANT TO OIL PALM PLANT IN HARUM SARI VILLAGE TAMIANG HULU DISTRICT ACEH TAMIANG DISTRICT

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Abstract

Crops that are currently in great demand by the community are rubber and oil palm plantation plants. The imbalance of rubber production and the price of rubber sales with maintenance costs for the management of rubber plantations caused farmers to start changing the function of their agricultural land. This research was carried out on the conversion of people's rubber plants in Harum Sari Village, Tamiang Hulu District, Aceh Tamiang Regency in September 2022. This study aims to analyze the influence of the conversion of the people's rubber plant into an oil palm plant in Harum Sari Village, Tamiang Hulu District, Aceh Tamiang Regency. In this study, it used a quantitative method in the form of multiple linear regression analysis using SPSS software version 22. Sampling was carried out using the purposive method of samples taken in the study as many as 50. The results of this study simultaneously the price of rubber as much as land conversion, farm costs, rubber production, total rubber land area before land conversion, education has a significant effect on the area of rubber land converted. Partially the price of rubber, the cost of farming, rubber production, the total land area and education have a significant effect on land conversion.

Keywords: *land conversion, rubber farming and oil palm farming.*

1. INTRODUCTION

Indonesia is an agricultural country, which means that agriculture plays an important role in the overall national economy. This can be seen from the large number of people working in the agricultural sector. In this issue it is explained that national development is directed at the development of advanced or efficient agriculture that is resilient. This situation contains agricultural sector policies that are adapted to the conditions and developments that occur in the field in overcoming various problems related to the welfare of the nation (Hartanto, 2014). Indonesia is one of the tropical regions which is very good for planting agricultural crops such as rubber (*Hevea brasiliensis*) and oil palm (*Elaeis guineensis* jacq) rubber and oil palm are commodities that receive great attention in Indonesia both on large plantations owned by companies and plantations people. Oil palm has an important meaning for the development of national plantations. Besides being able to create job opportunities that lead to social welfare, it is also a source of earning foreign exchange (Fauzi, 2013). One area that is also the prima donna in the plantation sector is Aceh Province.

Aceh is an area that has agricultural commodities which are busy being occupied by the people, especially the Aceh Tamiang region. The people of Aceh Tamiang in their daily lives carry out many agricultural activities, namely cultivating plantation crops. Plantation crops that are currently in great demand by the community are rubber and oil palm plantations. Land is a natural resource that has a very broad function in meeting various human needs. From an economic standpoint, land is the main permanent input for various agricultural and non-agricultural

commodity production activities. The amount of land used for production activities is a derivative demand from the needs and demand for the commodities produced. The development of land requirements for each type of production activity will be determined by the development of the number of requests for each commodity (Goenawan, 2013). Land use in general can be grouped into 2, namely agricultural land use and non-agricultural land use. Non-agricultural land use, namely land used as development areas such as housing, while agricultural land use is used for farming activities, many agricultural commodities are Indonesia's export commodities, but the most prominent are commodities from the plantation sub-sector, which is around 85% of total agricultural product exports. Daulay in Goenawan (2013).

The plantation sub-sector is one of the farming businesses which of course requires maintenance costs and special treatment so that the plantation crop production results are as desired. However, this has a different result than what was experienced by the farmers of Harum Sari Village where the rubber yields obtained were not in accordance with the costs of caring for the rubber plants so that the results of this rubber production often could not meet the needs of the rubber farmers' lives. The imbalance in rubber production and the selling price of rubber with maintenance costs for managing rubber plantations coupled with low rubber production has caused farmers to start converting their agricultural land from rubber to other commodities (Handayani, 2015).

2. LITERATURE AND THEORETICAL REVIEW

2.1. Agricultural land

Land is a land area with characteristics that include everything attached to the atmosphere, soil, geology, generation, hydrology, plant and animal populations, as well as human activities on it. Land quality is one of the factors that greatly determines the success of an agricultural business, because almost all agricultural activities are carried out on land (Notohadirawino, 1996). Land has an important meaning for stakeholders who utilize the function of land for the community as a place to live from a source of livelihood for farmers, land is a place to do farming which in the end is a source of income. For the private sector, land is an asset to accumulate capital. As for the government, land is the sovereignty of a country and for the welfare of its people. Based on these many interests, it often results in overlapping of land uses. Agricultural land is land designated for resource agricultural activities, agricultural land has many benefits for everyone (Sumaryanto, 2005) the benefits of agricultural land are divided into two categories. First, use values personal use values or the value of using these benefits is obtained from the results of exploitation or activities on agricultural resources. Second, non-value uses/intrinsic values or innate benefits, these benefits are created by themselves even though they are not the goals and exploitation activities of agricultural land owners.

2.2. Conversion of Agricultural Land Functions

Based on research by Pakpahan et al (1993) that the increasing rate of conversion of agricultural land to other uses or to non-agricultural uses, especially in rural areas that are located close to economic centers, has resulted in the diminishing and limited availability of agricultural land. The narrowing of agricultural land as a result of the continued increase in the number of agricultural lands that have changed their function, will reduce the number of arable land, and will ultimately have an impact on reduced employment for farm laborers. In general, land conversion

has a negative impact on small land, which is indicated by the decreasing area of land ownership and only a small number of farmers can take advantage of the economy that arises from land conversion (Susilowati et al, 2004). Transfer of land use or commonly referred to as land conversion is a change in the function of part or all of a land area from its original function (as planned) to another function that has a negative impact on the environment and the potential of the land itself. Land conversion can also be interpreted as a change to other uses caused by factors which broadly include the need to meet the needs of an increasing number of residents and increasing demands for a better quality of life (Lestari, 2013). Land conversion is a change in the function of part or all of a land area from its original function (as planned) to another function which has a negative impact on the potential and the environment itself. The process of conversion of agricultural land to non-agricultural use is caused by several factors (Kustiwan, 1997).

2.3. Factors Influencing Land Function Transfer

The factors that affect land conversion in (Hasibuan, 2016) consist of:

1. Price

Basically, changes in selling prices will have a huge impact on farmers. One of the influences is the income level of the farmers, which in turn is very influential in motivating or increasing the work productivity of the farmers. Darwis (2006), states that "the selling price is a motivator for farmers to do their job". Factors that play an important role in causing the process of converting agricultural land to non-agricultural land are as follows: 1. Agricultural price fluctuations. Concerning aspects of fluctuations in commodity prices that can be produced from rice cultivation. 2. Structure of agricultural production costs. The costs of production and activities for cultivating paddy fields are increasingly expensive and tend to strengthen the process of land conversion. 3. Technology, delays in the development of intensification technology in land use that has an ever-increasing level of agriculture will result in a more dominant extensification process. 4. Accessibility. Changes in transportation facilities and infrastructure which have implications for increasing local accessibility will further encourage the development of agricultural land use to non-agricultural use. 5. Risk and uncertainty, agricultural activities with a high level of risk of uncertainty will reduce the expected value of the level of production, prices and profits. Thus land use that has higher risk and uncertainty will tend to be converted to other uses with lower risk (Nasution et al, 2000).

2. Farm Income

Farming income is a measure of income received by farmers from their farming. In the analysis of farming, farmers' income is used as an important indicator because it is the main source in meeting their daily needs. Farming income is the difference between receipts and production costs, both variable production and fixed production costs (Kindagen, 2000).

The economic factor that determines land conversion is the declining competitive value of the commodity produced against other commodities. There is an increase in the response of farmers or plantation entrepreneurs to market dynamics, the environment and farming competitiveness which will ultimately refer to the level of costs and income generated both in the short term and in the long term which will increase (Ilham et al., 2009).

3. Farming Costs

Farming costs are the total costs incurred in running a farm. The amount of costs incurred by farmers in running their farming business depends on the area of land and other input requirements.

The low incentives that farmers get as a result of the high costs incurred in running a farming business are one of the considerations for farmers in converting their land.

4. Ownership land area

Land fragmentation or shrinkage of ownership of agricultural land area which is the impact of land conversion causes a decrease in the area of land owned by farmers. A decrease in business scale will result in increasingly unproductive land. Conversion of agricultural land has a direct impact on farmers, namely a decrease in the area of land ownership and a decrease in the area of arable land (Ruswandi et al., 2007). Conversion of food agricultural land in the form of land use transfer for specific and strategic commodities that can be exported, is often considered as optimizing land use, but one day it will have a negative impact on food security (Popescu et al., 2017).

5. Farmer Education Level

Education is very important for someone in life. The higher a person's education, the more mature they think and act, which in turn will increase work productivity. According to Bhaskara et al. (2011), the level of farmer education influences the decision to convert paddy fields. Where, the higher the farmer's education, the more critical in making decisions, but conversely if the lower the education, the easier it is for the farmer to be influenced by other people.

2.4. Previous Research

This research was conducted by Irawan (2015), conducted in Pegajahan District, Serdang Berdagai Regency, the factors that influence the conversion of paddy fields into smallholder oil palm plantations which show that the expenditure factors of farming families, paddy rice productivity and area of land ownership have a significant effect on the transfer the function of paddy fields into smallholder oil palm plantations in Pegajahan District. Research conducted by Muzzani (2015) analyzed the factors considered by farmers related to the conversion of irrigated paddy fields to oil palm plantations in Hatonduan District, Simalungun Regency. Variables related to farmers' decisions to change the function of their land are economic factors that include land availability, farming profits and farming maintenance costs. Environmental factors which include pests and diseases, irrigation conditions and land area.

Research conducted by Goenawan (2015), research on the Analysis of Converting Rubber Land to Oil Palm Land in Kampung Dalam Village, Bilah Hulu District, Labuhan Batu Regency. The aims of the researchers were: to find out the factors that influenced the conversion of rubber land to oil palm land. Factors that are thought to influence the conversion of rubber land to oil palm are rubber input costs, palm oil input costs, rubber labor costs, and palm oil labor costs. The data used is primary data, namely data obtained by direct interviews with farmers. In analyzing the magnitude of the influence of variables, an econometric model is used by regressing the existing variables using the Ordinary Least Square method of small squares.

3. IMPLEMENTATION METHOD

3.1. Location, Object, & Research Scope

The research location was carried out in Harum Sari Village, Tamiang Hulu District, Aceh Tamiang Regency, Aceh Province. The selection of the research location was carried out purposively (purposive) with the consideration that Harum Sari Village is a village that has converted the function of rubber land. The object of this research is rubber farmers who convert

rubber land into oil palm plantations. The scope of this research is limited to the factors that influence the conversion of rubber plantation land to oil palm plantations in Harum Sari Village, Tamiang Hulu District, Aceh Tamiang Regency, Aceh Province.

3.2. Data Types and Sources

The data needed in this study include:

Primary data obtained from interviews, questionnaires, or observations of rubber farmers who convert their land to oil palm.

Secondary data, namely data taken from related agencies to complete the data needed in research such as BPS Aceh Tamiang, BPP Tamiang Hulu District, journals, internet, theses, articles and literature.

3.3. Population and Sample

This research was carried out using a survey method, sampling was carried out by means of purposive deliberately against smallholder rubber farmers. The number of rubber farmers in the village is 50 farmers who change the function of their land. The data collection technique or population as a whole to be investigated is called a census (Sudijono, 2009).

3.4. Data analysis

Data analysis to answer the formulation of the problem was analyzed using quantitative descriptive analysis. This analysis was conducted to determine the relationship between the independent variables and the dependent variable. By using multiple regression analysis with the OLS (Ordinary Last Square) approach with the formula:

$$Y = \beta + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + e$$

Information:

Y = Area of land converted to function (ha)

B= Constant

b1-b5 = regression coefficient

X1 = Price of rubber before land conversion (Rp/kg)

X2 = Cost of rubber farming before land conversion (Rp/year)

X3 = Production of rubber plantations before land conversion (kg/area land/year)

X4 = Total rubber area before land conversion (ha)

X5 = Education level of farmers

e = Term error

3.4.1. Classic assumption test

Classical assumption test is a statistical requirement that must be carried out in multiple linear regression analysis based on ordinary least squares. In OLS there is only one dependent variable, while there are more than one independent variables.

1. Normality test
2. Multicollinearity Test
3. Heteroscedasticity Test

3.4.2 Statistic test

Statistical testing is a formal technique that relies on probability distributions to reach conclusions about the reasonableness of a hypothesis to determine whether there is sufficient evidence to reject or accept the hypothesis.

1. Coefficient of Determination (R^2)

2. Simultaneous Hypothesis Test
3. Partial Hypothesis Test

4. RESULTS AND DISCUSSION

4.1 Factors Influencing the Function Change of Rubber Land to Oil Palm Land

Multiple linear regression analysis is used to determine the effect of the independent variables on the dependent variable. This study examines the factors that influence the conversion of smallholder rubber plantations to oil palm plantations in Harum Sari Village using multiple linear regression analysis. This problem is that farmers are converting rubber land into oil palm plants which require a lot of maintenance costs and low production yields as well as a cheap selling price of rubber. The number of respondents used in this study was 50 respondents but because the value of the adjusted R square resulted in a value of 0,490 means that the effect is weak between variables so that it is unable to explain how far the variable has an effect, so data normalization is carried out by removing 8 respondents who are considered as outliers in order to get accurate regression analysis results of the effect between variables, so that the remaining number of respondents is 42 (Ghozali, 2016). Can be seen in (Appendix 3).

4.2 Classic assumption test

classical assumption test is a statistical requirement that must be carried out in multiple linear regression analysis based on ordinary least squares. In OLS there is only one dependent variable, while there are more than one independent variables.

1. Normality

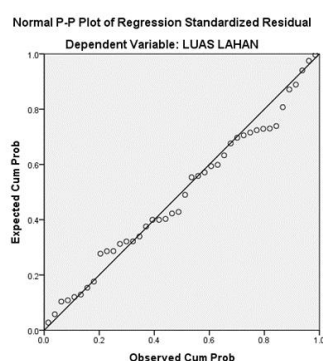


Figure 2. Normal P-Plot Graph

Based on the test results of the p-plot graph above, it shows that the data tends to be straight and follows a diagonal line so that it can be seen that the data on the factors that influence the conversion of smallholder rubber land to oil palm plantations is normally distributed.

2. Multicollinearity

Table 1. Multicollinearity Assumption Test Results for Variable X1-X5

No	Variable	VIF	Information
(1)	(2)	(3)	(4)
1	Rubber Prices	-3,874	Non Multicollinearity
2	Farm Business Costs	3,032	Non Multicollinearity
3	Rubber Production	-4,426	Non Multicollinearity
4	Total Land Area	5,463	Non Multicollinearity
5	Education	3,458	Non Multicollinearity

Source: SPSS Result Data Processed in 2022.

Based on the output results above, it can be seen that the Variance Inflation Factor (VIF) value for the rubber price variable is -3.874, the farming cost variable is 3.032, the rubber production variable is -4.426, the total land area variable is 5.263, and the education variable is 3.458, to find out the presence of multicollinearity can be seen from the value of the Variance Inflation Factor (VIF) if the VIF value is > 10 then the regression model used has multicollinearity. Conversely, if the VIF value < 10 , then multicollinearity does not occur.

3. Heteroscedasticity Test

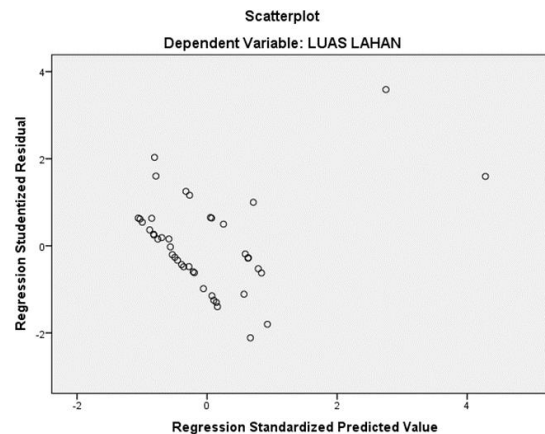


Figure 3. Scatterplots

From the picture above it can be seen that the distribution of the points does not form a certain pattern and the points spread above and below the number 0 and the Y axis so that it can be concluded that there is no heteroscedasticity.

4.3 Statistic test

The test is used to see how the effect of the independent variables used in the regression model and in this case the independent variables used are the price of rubber before land conversion (Rp), farming costs before land conversion (Rp/year), rubber production before land conversion (Kg/year), total land area (ha), Education on the dependent variable, namely the area of land converted (ha).

1. Coefficient of Determination (Adjusted R-Square)

The coefficient of determination is carried out to measure how much influence the independent variables have on the dependent variable. Based on the analysis conducted, it can be concluded that rubber prices, farming costs, rubber production, total area of rubber land, education are able to explain 69.1% of the converted land area, while the remaining 30.9% is explained by other variables outside the model (explained by variable others not examined). This study uses the Adjusted R-Square value because the independent variables studied are more than one variable and have different units.

2. Test Simultaneously (F)

The F test was carried out to explain how the influence of the independent variables on the dependent variable simultaneously with a significant 5%. To find out the effect of rubber prices before land conversion, farming costs before land conversion, rubber production, total land area, education on the variable area of land converted can be seen from the sig F value.

The estimation results of the F test obtained a sig F value of 0.000, which means $0.000 < 0.005$ thus simultaneously the price of rubber before land conversion, farming costs before land

conversion, rubber production before land conversion, total land area, education have a significant effect on land area which is converted.

3. Partial test (t test)

The partial test or t test is used to find out whether the independent variables used, namely the price of rubber before land conversion, farming costs before land conversion, rubber production before land conversion, total land area, education have a significant effect or not on the dependent variable, namely land area. which is converted. The results of the test can be seen in the table below:

Table 2. Results of Regression Output Analysis.

No	Variable	Coefficient	T count	Sig
(1)	(2)	(3)	(4)	(5)
1	Constanta	156,360	4,145	,000
2	Rubber Prices	-.029	-3,874	,000
3	Farming Costs	2.530E-5	3,032	,004
4	Rubber Production	-.026	-4,426	,000
5	Total Land Area	.279	5,463	,000
6	Education	1,552	3,458	,001
R = ,854a		Adjusted R2 = .691	Fhits = 19.355	
R2 = ,729			F sig = 0.000	

Source: SPSS Result Data Processed in 2023.

a. Rubber Prices

Partially the price of rubber (X_1) has a significant effect on the area of land converted. This can be seen from the significant value, which is 0.000, which is smaller than the sig value of 0.005. The rubber price regression coefficient is -0.029 which indicates that if the rubber price increases by IDR 1, it will reduce the conversion of farmers' rubber land to oil palm land. Based on research in the field, the price of rubber received by farmers has decreased, namely Rp. 4,700/kg - Rp. 5,200/kg, thereby affecting farmer acceptance which has an impact on farmers' income so that farmers convert their rubber land functions. This is in line with research by Dewi Kurniati (2020) which shows that palm oil prices have a negative and significant effect which explains that prices determine land conversion.

b. Farming Costs

Partially cost (X_2) has a significant effect on the area of land converted, this can be seen from the significant value of 0.004. The value of the cost regression coefficient is 0.00002530 which indicates that the cost of farming before land conversion increases by IDR 1, it will cause an increase in the conversion of rubber land to oil palm land. Based on research in the field, the costs borne by farmers in Harum Sari Village are quite high, especially in the cost of poisons and wages for labor in rubber farming, as a result, farmers choose to change the function of their rubber land. This is in line with Ayu Widya Astuti's research (2018) which explains that any increase in farming costs before land conversion will lead to an increase in land conversion.

c. Rubber Production

Partially the production of rubber plants before land conversion (X_3) has a significant effect on the area of land converted, this can be seen from the significant value of 0.000, which is significantly less than the value of 0.005. The value of the regression coefficient for rubber production is -0.026 indicating that if rubber production increases by 1 kg, farmers will reduce the

conversion of rubber land to oil palm land. If rubber production decreases, it will allow farmers to change the function of their land. Based on research in the field of smallholder rubber production, farmers obtained an average of 2269 kg/land area/year, while in research conducted by Hormansyah (2010) the normal average rubber production was 10,000 kg/land area/year in the journal of the East Kalimantan provincial plantation service.

d. Total Land Area

Partially the total land area (X4) has a significant effect on land conversion, this can be seen from the significant value on land conversion 0.000 which is less than 0.005, the regression coefficient value for the total land area is 0.279 which states that every rubber area increases by 1 ha will cause an increase in land conversion by 0.279 Ha. Based on research in the field, the conversion of functions has increased because the costs borne by farmers in maintenance are quite high, the selling price is not appropriate, then low rubber production has resulted in farmers choosing to transfer the function of their rubber land. This is in line with Ayu Widya Astutsi's research (2018) which examined the Analysis of Factors Influencing the Area of Conversion of Rubber Land to Sweet Oranges in Sekoci Village, Besitang District, Langkat Regency.

e. Level of education

Partially education (X5) has a significant effect on land conversion, it can be seen from the significant value of land conversion 0.001 which is less than 0.005 education regression coefficient value of 1.522 this value states that if education increases by 1 then there is an increase in land conversion of 1.522 meaning that the higher the level of education farmers experience an increase in land use change. As stated Bhaskara et al. (2011) that the higher the level of education, the more critical it will be in making decisions to carry out land conversion. Based on research that occurs in the field, the education level of farmers who carry out land conversion, namely elementary school level up to Strata 1, this is in accordance with what Bhaskara revealed that the higher the education of farmers, the wiser they are in making decisions to carry out land conversion.

5. CONCLUSION

Simultaneously the price of rubber before land conversion, farming costs before land conversion, rubber production, total land area, and education significantly influence the area of land conversion from rubber to oil palm plantations in Harum Sari Village, Tamiang Hulu District, Aceh Tamiang District. Partially one - one rubber price variable, rubber farming costs, rubber production, total land area, and level of education have a significant effect on the area of conversion of rubber land into oil palm plantations in Harum Sari Village, Tamiang Hulu District, Aceh Tamiang District.

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