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Factors Affecting The Conversion Of Cocoa Farming land function to Paddy fields Farming In Penanggo Jaya Village, Lambandia District, East Kolaka Regency

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Abstract

This study aims to determine the factors that influence the conversion of cocoa farming land function to lowland paddy fields farming in Penanggo Village, Lambandia District, East Kolaka Regency. This research was conducted from November to December 2021. The research method uses quantitative descriptive. The selection of the location of this study was determined deliberately (purposively), taking into account that Penanggo Jaya Village has a number of farmer households that have transferred cocoa land to paddy fields. The population in the study numbered 392 people. The sampling technique uses the Slovin formula with an error degree (α) of error of 15%. The number of respondents was 72 people. The data analysis used in this study is Logistic Regression Analysis, steps in testing assessing the overall model (overall model fit/G test), assessing the feasibility of the regression model and wald test (partial). The results showed that pest and disease attacks of 0.030 < 0.05 and production yields of 0.000 < 0.05, these two variables have a significant chance of influencing the decision of farmers to transfer cocoa land to paddy rice crops, while plant age, land area and infrastructure have no chance of influencing farmers' decisions to transfer cocoa land to paddy field crops.The results of this study indicate that with the transfer of community land in Penanggo Village, Lambandia District, East Kolaka Regency, they can meet and increase their economy.

Keywords: Cocoa, Paddy field, Land Transition, Logistic Regression.

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INTRODUCTION

In agricultural businesses, farmers are always faced with various choices throughout the process of processing their agricultural business. These choices can take the form of choosing a suitable agricultural location, the type of commodity that will be cultivated, the fertilizer and pest medicine that will be used, the place to market the agricultural commodity, processing methods or strategies, and so on. There are so many choices that accompany farmers in their business, of course as a business actor they will choose one of these options and this process can be said to be a decision-making process. Recently, there have been various issues where farmers, perhaps because they feel dissatisfied or do not get profits from one agricultural commodity, they then switch,(Nurmedika et al., 2015).

The conversion of agricultural land is quite a phenomenon happened recently in Indonesia. This is in line with population growth and development activities resulting in demand and need for The higher land is used to carry out internal activities agricultural and non-agricultural sectors. In economics, activities what is considered unproductive and unprofitable will always be quickly lost replaced with other more productive and profitable activities. Competition occurs for the most profitable use so that it can encourage the occurrence of changes in land use (Kustiawan, 2007).

Land conversion tends to be a problem (negative) in the agricultural sector, however, there is still a lot of agricultural land that is converted due to economic pressure during times of economic crisis or low sales results in the agricultural sector causing many farmers to sell their land assets in the form of plantations or rice fields to meet their living needs which indirectly causes an increase in the conversion of agricultural land and further increases land control by parties who have high capital(Nurhapsah, 2019).

Land is a natural resource that is important for human survival as a place for their living activities. This need from time to time increases along with the increase in population and the development of activities. Meanwhile, space as a physical container for activities has a relatively fixed area, does not increase. Therefore, the balance between space and human activities needs to be carefully thought out so that inequality does not occur by converting agricultural land to physical development(Husna et al., 2018)Cocoa (Theobrema cacao L.) is an important plantation commodity for the Indonesian economy, because it is an export commodity. Indonesia is the world's 3rd largest cocoa exporter after Ghana and Ivory Coast. The area of cocoa plantations in Indonesia is 1.7 million ha, of which 97.3% are community plantations, 0.8% are large state plantations, and 1.3% are private plantations.(Taufiq and Purwono, 2020). Cocoa is a mainstay plantation commodity whose role is quite important for the national economy, especially as a

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provider of employment opportunities, a source of foreign exchange, regional development and agro-industry development.(Endul et al., 2018).

Southeast Sulawesi Province itself, the agricultural sector can be said to be one of the main drivers of the economy. Southeast Sulawesi Province is one of the cocoa production centers in Indonesia. We can understand this because this region has extensive agricultural land and has a high fertility rate compared to other regions. Even though the cocoa commodity makes the highest contribution to the economy, its development from year to year shows a level of decline which results in cocoa farming actors switching to other commodities, with the aim of providing a better livelihood.

Lambandia District is one of the areas in East Kolaka Regency which is the center of cocoa production. In 2014, cocoa production in Lambandia District was recorded at 15,584.9 tons, with a land area of 31,638.50 Ha. Then it decreased in 2015 with production of 14,986.87 and land area of 31,638.50 Ha(BPS Kolaka, 2018). Penanggo Jaya Village is one of the areas in Lambandia District, East Kolaka Regency. Penanggo Jaya Subdistrict has an area of 18.40 km2 with a population of 3,429 people. Cocoa plantations in Penanggo Jaya Village are the main commodity for farmers' income. However, as time goes by, due to the decline in cocoa productivity, it is difficult for farmers to maintain cocoa production, because the cocoa plants are old and pests and diseases are difficult to control, making most cocoa farmers switch to lowland rice fields. With support and assistance from the government, in 2018 phase I of the land transfer was carried out. In 2020, phase II land transition was carried out by converting 165 ha of cocoa land into lowland rice land with 125 farmers carrying out land transfer.

The hope of farmers in Penanggo Jaya Subdistrict is to convert cocoa land into paddy fields to increase their income. So that the needs of farming households can be met and can improve their economy. The products produced from the paddy fields themselves are not only sold to collecting traders, but are also consumed by the farmers themselves. The aim of this research is to determine the factors that influence the conversion of cocoa farming to lowland rice farming in Penanggo Village, Lambandia District, East Kolaka Regency.

MATERIALS AND METHODS

This research was carried out in Penanggo Jaya Village, Lambandia District, East Kolaka Regency. This research was carried out from January to December, 2022. The choice of location for this research was determined purposively in one sub-district with the consideration that Penanggo Jaya Sub-District is a potential area for strategic agricultural and plantation production activities, where cocoa plantations are source of livelihood for the community in

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Penanggo Jaya Subdistrict, taking into account that Penanggo Jaya Subdistrict has a number of farming households that have converted cocoa land into lowland rice fields. This research began in October 2021 to February 2023.

The population in this study was 392 farmers, consisting of 221 cocoa farmers with a sample size of 37 farmers, and 171 cocoa farmers who switched land use to paddy fields with a sample size of 35 farmers. Determination of the sample in this study used the Slovin formula and took an error rate of 15%. A sample is a portion taken from all objects under study which is considered representative of the entire population and taken using certain techniques(Rianse and Abdi, 2009). Determination of the sample size was carried out using the Slovin formula and taking an error rate of 15%.

The data collection techniques used in this research were observation, interviews and library techniques. The analysis used to see what factors influence the conversion of cocoa land into paddy fields uses logistic regression analysis to explain it, with quantitative data processed using Microsoft Excel and SPSS 20 software.

The type of logistic regression used in this research is binary logistic regression because the Y (dependent) variable only consists of two, namely 1 and 0. The Y (dependent) variable is a cocoa farmer which is transformed into two dummy variables, namely the value 1 for respondent farmers who continue to farm. cocoa and a value of 0 for respondent farmers who transitioned cocoa land to paddy fields. The X (independent) variables used in this research are farmer age (X1), land area (X2), pest and disease attack factors (X3), Cocoa Production Yield (X4), and Irrigation (X5). Hosmer and Lemeshow (2000), formulated the form of the logit equation model as follows:

$$Y = \ln\left[\frac{\pi(x)}{1-\pi(x)}\right]$$

$$Y = \beta + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5$$

Note: Y = Farmer's decision to farm cocoa (dummy, for farmers who transfer cocoa land to paddy fields = 1 and for farmers who continue to farm cocoa = 0); X1 = Farmer's Age (years); X2 = Land Area (ha); X3 = Pest and disease attacks (dummy, if high = 1, if low = 0); X4 = Cocoa Production Results (kg/year); X5 = Irrigation (dummy, if adequate = 0, if inadequate 1); β = Constant; β1…β3 = Estimated coefficient of the independent variable; e = Tram error

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RESULTS AND DISCUSSION

Characteristics of Respondent Farmers

Respondents were farmers who did not transition their land and farmers who transitioned their land from cocoa to paddy fields and farmers (people).

Table 1. Age of Respondents

No	Farmer Age (years)	Land transfer			
		Not switching		Switch	
		Amount (person)	Percentage (%)	Amount (person)	Percentage (%)
1	Not Yet Productive (0-14)	0	0	0	0
2	Productive (15-54)	28	75.68	29	82.86
3	non-productive (>55)	9	24.32	6	17.14
	Amount	37	100	35	100

Source: Penanggo Jaya subdistrict office 2021

Table 1 shows that the age of the respondent farmers in this study is still in a productive condition. the number of respondents aged 15-54 years was the highest with percentage values of 75.68% and 82.86%. Farmers who are of productive and healthy age have strong physical abilities, are able to think and have a high interest in farming activities, and are more willing and willing to take risks in an effort to advance their farming business. This is in accordance with the opinion of Soniasi (2020), the productive age of respondents who are at the location greatly influences work performance, in terms of physical ability, experience and way of thinking in solving problems related to farming activities.

Table 2. Respondents' education level

No	Level Education	Land transfer			
		Not switching		Switch	
		Amount (person)	Percentage (%)	Amount (person)	Percentage (%)
1	elementary school	4	10.81	7	20
2	JUNIOR HIGH SCHOOL	19	51.35	11	31.43
3	SENIOR HIGH	14	37.84	17	48.57

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	SCHOOL				
	Amount	37	100	35	100

Source: Penanggo Jaya subdistrict office 2021

Table 2 shows that the educational level of respondent farmers in Penanggo Jaya Subdistrict has received formal education with the majority having completed elementary, middle and high school education. The number of farmers who did not transition from cocoa land to lowland rice was mostly at the junior high school education level with a percentage of 51.35% and farmers who did transition from cocoa land to lowland rice had a high school education level with a percentage of 48.57%. This can be interpreted as meaning that farmers must also be educated in order to increase their knowledge so that they can increase their harvest productivity and be able to consider it. At the educational level, it has quite an influence on the implementation of farming activities, especially in knowing science and technology, including in making decisions related to the implementation of farming.

Table 3. Farming Experience

No	Experience Doing farming (Year)	Land transfer			
		Not switching		Switch	
		Amount (person)	Percentage (%)	Amount (person)	Percentage (%)
1	Not enough experienced (<5)	0	0	0	0
2	Enough Experienced (5-10)	4	10.81	2	5.71
3	Experienced (>10)	33	89.19	33	94.29
	Amount	37	100	35	100

Source: Penanggo Jaya subdistrict office 2021

Table 3 shows that the majority of farmer respondents who did not switch cocoa land to lowland rice land were classified as experienced farmers, namely 33 farmers with a percentage of 89.19%, while farmer respondents who switched cocoa land to lowland rice land were classified as experienced farmers, namely as many as 33 farmers with a percentage of 94.29%. This indicates that the farmer's experience in farming is very good because farming experience

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will provide motivation for farmers to correct or evaluate themselves in farming.

Table 4. Number of Family Dependents

No	Dependents Family (Person)	Land Transfer			
		Not switching		Switch	
		Amount (person)	Percentage (%)	Amount (person)	Percentage (%)
1	Small Family (1-3)	23	74.19	27	77.14
2	Medium Family (4-6)	14	37.84	8	22.86
3	Large Family (>6)	0	0.00	0	0.00
	Amount	37	100	35	100

Source: Penanggo Jaya subdistrict office 2021

Table 4 shows that the majority of respondent farmers have family dependents of 1-3 people with the percentage of farmers who did not switch land as much as 74.19% and farmers who switched as much as 77.14%. Farming can be obtained from within the household. With the availability of sufficient labor in a household, farming activities do not require hiring labor from outside the family.

Factors that influence farmers to transfer land

Testing of the hypothesis to determine the factors that influence the conversion of cocoa land to paddy fields was carried out using logistic regression analysis. First, a feasibility test of the logistic regression model was carried out by looking at the Hosmer and Lemeshow values to determine the suitability of the model and the Nagelkerke R Square value to measure the goodness of the model, then tested the entire model by looking at the Likelihood Ratio value, after that a partial test was carried out to interpret the coefficients.

*Goodness of Fit*used to determine the suitability of the model by testing the null hypothesis that the empirical data is suitable or in accordance with the model (there is no difference between the model and the data so the model can be said to be fit) (Ghozali, 2018).

This test is carried out after a significant model test determines that there is at least one independent variable that has a significant influence on the dependent variable. The aim is to see the magnitude of the influence of the independent variable which has a significant influence on the dependent variable. Estimates of the logistic regression model are presented in Table 2.

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Table 5. Estimation results of the logistic regression model

No	Variable	Coefficient	Exp (B)	Wald	Significance
1	X1 (Farmer Age)	-0.016	0.984	0.264	0.607
2	X2 (Land Area)	0.266	1,305	0.983	0.321
3	X3 (Pests and Diseases)	1,932	6,904	4,695	*0.030
4	X4 (Cocoa Production Results)	-0.001	0.999	16,519	*0,000
5	X5 (Irrigation)	-0.883	0.414	1,253	0.263
	Constant	4,414	82,599	4,129	0.042

Note: * = Real or significant at the 95% confidence level or α = 0.05

The results of estimating regression coefficients using a logistic model on five independent variables in Table 5 show that one variable that influences farmers' decisions to transfer land is pest and disease attacks (X3) and production yield (X4), while the variable that has no influence is age. farmers (X1), land area (X2), and irrigation (X5).

Farmer Age (X1)

Data analysis using logistic regression was carried out to determine the opportunities and factors that influence farmers to transfer land. Through the Wald test (partial), the significance value for farmer age was obtained at 0.607. This value is greater than 0.05, which means that the farmer's age variable has no real influence on the farmer's decision to switch cocoa land to lowland rice. The coefficient value obtained is -0.016 and is marked (-) and the Exp (β) value or odds ratio obtained is 0.984, meaning that if the farmer's age increases by 1 year, the opportunity to switch cocoa to lowland rice crops decreases by 0.607 times compared to that. do not carry out land transfers. The research results show that the average age of farmers who transition from cocoa land to lowland rice is greater than farmers who transition land. This shows that the age of farmers for these two commodities is not significantly different and is not one of the factors that influences farmers to switch cocoa land to lowland rice crops.

The farmer's age factor does not have a significant influence on the farmer's decision to switch cocoa land to paddy land, because farming does not always depend on age. This can be seen from the farmer's ability to farm, not only from how long the farmer has been farming but from his determination and skills in farming. This is also in line with research by Wulandari et al. (2017), who stated that the farmer's age variable did not have a significant effect on farmers'

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decisions to convert paddy fields in Kaliwates District, Jember Regency.

Land Area (X2)

Data analysis using logistic regression was carried out by knowing the opportunities and factors that influence farmers to switch cocoa land to paddy fields. Based on the results of data analysis through the Wald test, the significance value was 0.321, greater than 0.05, this shows that land area has no real effect on farmers' decisions to switch cocoa land to lowland rice crops. The coefficient value obtained is 0.266 and has a positive sign (+) and the Exp value (β) or odds ratio obtained is 1.305, meaning that if the land area increases by 1 hectare, the opportunity to switch from cocoa to lowland rice increases by 1.305 times compared to by not carrying out land transfers.

The facts show that the area of land that has transitioned from cocoa land to lowland rice land is an average of 1.12 hectares, while the area of land that has not transitioned from cocoa land to lowland rice land is an average of 2.33 hectares. This shows that the land area of the two commodities has no real effect and is not one of the factors influencing farmers to transfer land. This is in line with research by Putra (2017), farmers who have large land sizes tend to defend their land because the larger the land, the more efficient their farming will be and the profits will be relatively greater. The larger the land owned by farmers, the smaller the land conversion will be.

Pest and Disease Attacks (X3)

Based on data analysis using logistic regression, pest and disease attacks have a significant effect on farmers' decisions to switch cocoa land to lowland rice crops. This is in accordance with the theory and hypothesis that pest and disease attacks influence farmers' decisions. The results of the Wald-statistical test (partial) show that the significance value for the pest and disease attack variables is 0.030, smaller than 0.05. The coefficient value of the pest and disease attack variable is 1.932, and the Exp (β) or odds ratio value obtained is 6.904, meaning that if pest and disease attacks are high, the probability of making a land transfer is 6.904 times greater than those who do not make a land transfer.

Pests and diseases in cocoa plants are often a nightmare for most farmers, especially farmers whose plants are old. Old cocoa is very vulnerable to pest and disease attacks because the age of cocoa does not allow it to produce better productivity. On cocoa plants, the pests that are often found are the Cocoa Pod Borer (PBK) and the cocoa pod sucker. The longer pests are present on cocoa plants, the more difficult it is to control them. Due to the difficulty of

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controlling pests on cocoa plants, this is the reason why cocoa farmers switch land to lowland rice. This is in line with research by Hastuty (2007), which states that one of the factors driving farmers to switch land use from cocoa to rice is triggered by pest and disease attacks,

Production Results (X4)

Based on data analysis using logistic regression, cocoa production results have a significant influence on farmers' decisions to switch cocoa land to lowland rice crops. This is in accordance with the theory and hypothesis that cocoa production factors influence farmers' decisions. The results of the Wald-statistical test (partial) show that the significance value of the cocoa production variable is 0.000, smaller than 0.05. The coefficient value obtained is -0.001, and has a negative sign (-) and the Exp value (β) or odds ratio obtained is 0.999, meaning that if cocoa production increases by 1 kg, the opportunity to switch cocoa land to lowland rice crops decreases by 0.999 times. fold compared to those who did not undertake land transfer.

Success can be seen clearly if the production results have an impact on farmers' income and tend to increase, so that is what encourages farmers to switch cocoa land to paddy fields.

Irrigation (X5)

Data analysis using logistic regression was carried out to determine the opportunities and factors that influence farmers to switch cocoa land to lowland rice crops. Based on the results of data analysis through the Wald test (partial), the significance value for farmer age was obtained at 0.263. This value is greater than 0.05, which means that the infrastructure factor variable has no real influence on farmers' decisions to switch cocoa land to lowland rice crops. The coefficient value obtained is -0.883 and has a negative sign (-) and the Exp value (β) or odds ratio obtained is 0.414, meaning that if the infrastructure factor is good, the possibility of carrying out land transfer is 0.414 times greater than those who do not carry out land transfer.

In farming activities, adequate water or good water availability can influence the success of a farming business. In the Penanggo Jaya sub-district, it could be said that the potential for existing irrigation channels should be good enough to increase the yield of rice farming because there are rivers and dams. However, in reality, not all land gets good and sufficient water because some land is far from rivers and dams. Land located close to rivers and dams has higher production results because of excellent irrigation channels. This is in line with the research results of Pramono (2015), which states that land conversion is influenced by irrigation, because irrigation is an important factor in lowland rice farming,

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CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on the results of the research that has been discussed, it can be concluded that the variables that have a significant chance of influencing farmers' decisions to switch land from cocoa to paddy fields in Penanggo Jaya Village, Lambandia District, East Kolaka Regency, are pest and disease attacks (X3) and production results. (X4), while the Farmer's age (X1), land area (X2) and irrigation (X5) have no chance of influencing the farmer's decision to switch cocoa land to lowland rice.

Suggestion

Based on the research results, the following suggestions can be obtained:

1. Respondent farmers who have not transitioned land should carry out more intensive plant maintenance (including pruning and fertilizing at the right dose and on time) so that the cocoa plants have high production from year to year and are maintained.
2. The government, especially in Penanggo Jaya Subdistrict, should provide intensive counseling to cocoa farmers in maintaining and cultivating cocoa plants, and to increase production yields for lowland rice plants.
3. For other research, it can be used as material for consideration for further research into other factors that can influence farmers' decisions in transferring land.

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