FACTORS AFFECTING LAND CONVERSION FROM RICE PLANTS TO LIME IN WATABENUA VILLAGE LANDONO DISTRICT

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ABSTRACT

This study aims to determine what factors influence land conversion from lowland rice plantations to lime plantations in Watabenua Village, Landono District. The population in this study were all farmers who had converted land in Watabenua Village, Landono District, South Konawe Regency, and as many as 33 people, where all were used as samples by the census method 33 respondents. The analytical method used is multiple linear regression analysis. The results of this study are the factors that affect the conversion of land from lowland rice plantations to lime plantations in Watabenua Village are the cost of citrus production. In contrast, the factors that do not affect land conversion are rice income, the distance between irrigation water sources to rice fields, the price of another product, namely limes.

Keywords: land conversion; lime; multiple linear regression; rice fields

INTRODUCTION

Agricultural conditions in Southeast Sulawesi based on data BPS (2019), in 2017 the area of paddy fields reached 128,680 ha but had the same level of production and productivity as in 2015 and 2016, namely production of 646.028 tons, the productivity of 47.87 kW/ha, however, in 2018 the standard area of rice fields was only about 79,910 ha, it showed a very drastic decline reaching 48.77 ha, as well as the level of production and productivity decreased very significantly. One of the causes of this decrease in land area is due to the conversion of paddy fields into non-rice fields and non-agricultural land due to the increasing human need for land in this case development and also due to the growing number of people (Manyamsari & Mujiburrahmad, 2014; Ridwan, 2009). This is a different problem in the agricultural sector that must solve the problem (Warsani, 2013).

Land conversion is a change in the function of land use from land that has been previously used to land with a new service. Rice fields are the land that most often undergoes conversion both for development and changes in the types of plants cultivated on the ground. The phenomenon of land conversion from paddy fields to other types of crops occurs in the village Watabenua, Landono District, South Konawe Regency. This conversion happens from paddy fields to lime fields.

From several research results indicate that many factors cause farmers to convert their paddy fields, as expressed by Asnawi et al. (2015), stating that The factors that influence the conversion of paddy fields are the age of the farmer, the level of education, the number of family members, the educational burden, and the total value of household assets. At the same time, research conducted by Sasongko et al. (2017) obtained six influential variables, namely land location, irrigation canals, economic crush, population growth, housing needs. A more specific study on the shift in the function of paddy fields to sweet limes was conducted by Matakena (2013), stating that education factors, farming experience, number of family members, income, and socio-cultural influence on the shift of rice farming to sweet limes, as well as far precious lime farming income. more profitable than rice farming income in a year and an area of one hectare.

The phenomenon of lowland rice land conversion needs a more in-depth study of the factors that cause land conversion. In some previous studies, no one has specifically examined the type of
lowland rice farming into citrus land and the irrigation distance factor, price of other commodities, and lowland rice farmers' income as factors that influence the conversion of lowland rice to lime land. So the purpose of this study is to find out what factors affect the conversion of lowland rice land into citrus fields in Watabenua Village, Lando District, South Konawe Regency.

MATERIAL AND METHOD

This research was conducted from January 2020 to March 2020 in Watabenua Village, Lando District, South Konawe Regency, Southeast Sulawesi Province. The total population in this study was 33 people. While the determination of the sample using the census technique is less than 100 people (Rianse & Abdi, 2009), the number of pieces in this study was 33 people. The data analysis used in this research uses multiple linear regression analysis with the help of the software SPSS 20.

Multiple linear regression analysis models can be formulated as follows (Priyatno, 2014):

\[ Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e \]  

Where: \( Y \): Area of paddy fields converted to citrus plantations (ha), \( a \): intercept, \( b_1-b_4 \): Estimated parameter regression coefficient (b=1,2, and 3), \( X_1 \): Production Cost (IDR), \( X_2 \): Income (IDR/kg), \( X_3 \): Price of Other Products (lime)/(IDR/Kg), \( X_4 \): Distance Between Irrigation Sources to Rice Fields (km), \( e \): Error term

RESULTS AND DISCUSSION

Characteristics of Respondents

Characteristics of respondents in Watabenua Village, Lando District, South Konawe Regency grouped by age, formal education, farming experience, number of dependents, and land area are presented in Table 1 as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Characteristics of Respondents</th>
<th>Unit</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>Year</td>
<td>47,12</td>
</tr>
<tr>
<td>2</td>
<td>Length of Education Level</td>
<td>Year</td>
<td>9 (junior high school)</td>
</tr>
<tr>
<td>3</td>
<td>Farming Experience</td>
<td>Year</td>
<td>16.94</td>
</tr>
<tr>
<td>4</td>
<td>Number of Family Dependents</td>
<td>Person</td>
<td>4.36</td>
</tr>
<tr>
<td>5</td>
<td>Land area</td>
<td>Ha</td>
<td>1.87</td>
</tr>
</tbody>
</table>

Source: Primary Data Processed, 2020

Based on the research results, the age characteristics of the respondents are classified as productive age, namely 47-12 years. This shows that the ability of farmers to manage their farms is still excellent to meet the living needs of all family members (Annisa & Lamusa, 2014). So that the respondent's ability to convert from lowland rice land to lime land is still able to be done. The education level of the respondents is relatively low, with an average of only nine years, although there are 11 respondents with up to 12 years of education. This shows that the ability of farmers to adopt better technology (Nwaobiala, 2018) or think for better farming development to increase the income of respondents (Sulaiman & Rasmahwati, 2018). The respondent's farming experience is on average 16.

While the number of dependents owned by the respondent's family is 4.36 people, this number is higher than the average household size in Southeast Sulawesi province (BPS, 2017). The greater the number of family dependents, the greater the expenditure on food and non-food consumption financed by the respondent (Saediman et al., 2019). The amount of cost is one of the indicators of farmer welfare (Fyka et al., 2019), so that respondents will think to provide better income results so that large enough expenses can be met. In addition, the large number of family members will contribute many ideas for better farming development (Antara, 2005). The land area owned by respondents is only 1.87 ha on average. The location of the land will influence the ability of respondents to produce better productivity. The wider the land area, the more excellent the opportunity to make higher productivity. In addition, the land area will influence farmers' willingness to apply technology to produce more efficient and valuable farming in managing their farms (Rahayu & Karyana, 2019).
Result of Analysis of Factors Affecting Land Conversion From Rice Fields to Lime Fields.

Analysis of the factors that influence the conversion of lowland rice land to lime land using multiple linear regression analysis with the independent variables being the price of lime, the distance from the water source to the paddy field, production costs and lowland rice income, and the dependent variable, namely land area. Based on the test, the regression results are obtained as follows:

Table 2. Results of multiple linear regression analysis for simultaneous test (f test) factors affecting conversion of paddy rice fields to citrus fields

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signification</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>4</td>
<td>661234990.050</td>
<td>13.744</td>
<td>0.000*</td>
<td>Significant</td>
</tr>
<tr>
<td>residual</td>
<td>28</td>
<td>48111451.638</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.614</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>0.663</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Signification Level = 0.05

Source: Primary Data Processed, 2020

The analysis results in table 2 show that the calculated F value is 13.744 with a significance of 0.000 at the error level (α = 0.005). Because the significance level of calculated F is smaller than the value of, it means that all independent variables (Xi) are Prices of other commodities (i.e., Limes), Distance from Irrigation Water Sources to Rice Fields, Rice Production Costs, Citrus Incomes together have a significant effect on the land area (Y). As for, the value of the coefficient of determination (R²) is 0.614, which means that 61.4% of the diversity of the land area variable (Y) can be explained by the variety of the independent variables (Xi), and the remaining 0.386% is explained by the diversity of other variables not included in the model. This proves that the multiple linear regression model can explain the effect of the independent variable (Xi) on the variable area of land (Y) so that the model is feasible to use.

After going through simultaneous testing, together the independent variable (X_i) affects the dependent variable (Y), then proceed with testing the independent variables using the t-test to determine the effect of each independent variable on the dependent variable. The results of the analysis of the independent variable test (X_i) are as follows:

Table 3. Results of multiple linear regression analysis for partial test (t-test) factors affecting conversion of paddy rice fields to citrus fields

<table>
<thead>
<tr>
<th>No</th>
<th>Independent Variable (X_i)</th>
<th>Regression Coefficient (β_i)</th>
<th>t count</th>
<th>Significance</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lime Production Cost</td>
<td>0.004</td>
<td>5.931</td>
<td>0.000</td>
<td>Take effect</td>
</tr>
<tr>
<td>2</td>
<td>Rice Income</td>
<td>0.000</td>
<td>2.995</td>
<td>0.004</td>
<td>Take effect</td>
</tr>
<tr>
<td>3</td>
<td>Distance from Irrigation Water Source to Rice Field</td>
<td>-1.366</td>
<td>-1.130</td>
<td>0.268</td>
<td>No effect</td>
</tr>
<tr>
<td>4</td>
<td>Lime Price</td>
<td>-0.999</td>
<td>-0.828</td>
<td>0.414</td>
<td>No effect</td>
</tr>
</tbody>
</table>

Constant = (-4867.726)
* Signification Level = 0.05

Source: Primary Data Processed, 2020

Based on the results of data analysis as presented in Table 3, the following regression equation is obtained:

\[ Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \varepsilon_i \]

\[ Y = (-4867.726) + 0.004X_1 + 0.000X_2 -1.366X_3 -0.999X_4 + \varepsilon_i \]

The following is the effect of each independent variable (Xi) on the dependent variable (Y) as follows:

a. Production Cost (X_1)

The variable cost of production (X_1) has a regression coefficient = 0.004 and t count = 5.931, with a significance level of 0.000. This value indicates that the variable production costs affect the
conversion of lowland rice land into lime land (Fausayana et al., 2019; Fitriyana, 2018; Yanti et al., 2013). This is caused by Production costs incurred by lowland rice farmers are relatively high and require more intensive maintenance to get optimal results. In addition, pest attacks also affect the amount of rice production costs incurred by respondents. This condition causes farmers to be more interested in growing lime because the production costs incurred are smaller when compared to the production costs of lowland rice. This is as the results of research from Fausayana et al. (2019) stated that lowland rice production cost was higher than the production cost of lime farming.

b. Paddy Rice Income (X2)
Lowland rice income variable (X2) has a regression coefficient = 0.000 and t count = 2.995 with a significance level of = 0.004. This value indicates that the variable of lowland rice income affects the conversion of lowland rice land into lime land (Fausayana et al., 2019; Matakena, 2013; Sari, 2017). This is because lime plants will bear fruit throughout the year so that in terms of income, it will increase compared to lowland rice plants. Besides that, citrus plants are not too dependent on water availability, while lowland rice plants are highly dependent on water availability, especially farmers in Watabenua Village. The irrigation system uses rivers, dams, and reservoirs or rain-fed systems so that the risk of crop failure is very high. In addition, due to the attack of rat pests that affect the income of rice farmers, it has decreased. While on the other hand, the income from lime farming is quite promising for farmers. This supports the results of previous research conducted by Matakena (2013); Fausayana et al. (2019); Martunisa and Noor (2018), which states that lowland rice income is one of the factors that influence farmers to convert their land into other, more profitable crops such as lime.

c. Distance from Irrigation Water Source (X3)
The variable distance from irrigation water sources (X3) has a regression coefficient = -1.366 and t count = 0.268, with a significance level of = 0.268. This value indicates that the variable distance from the irrigation water source does not affect the conversion of lowland rice land into lime land (Asnawi et al., 2015; Jamal, 2016). This is because the distance is not a big obstacle to water needs for rice plants but water sources such as rivers, dams, reservoirs, and springs, which is one of the obstacles to water availability for rice plants. This is in line with research conducted by Jamal (2016) and Asnawi et al. (2015) which stated that the irrigation distance factor did not affect the conversion of lowland rice land.

d. Price of Limes (X4)
Variable price of limes (X4) has a regression coefficient = -0.999 and t arithmetic = -0.828, with a significance value of = 0.414. This value indicates that the price of limes does not affect the conversion of paddy fields to citrus fields. This result is different from the research results conducted by Asnawi et al. (2015), which states that the price of substitute commodities is one of the factors affecting land conversion. This condition is caused because this happens. After all, the price of another commodity, namely lime, has a fluctuating price, meaning that the price of another commodity, namely lime, fluctuates when it drops to IDR500/Kg and when it is expensive, it can reach IDR12,500/Kg, at the research location of the farmers. Received the price of another commodity, namely lime, which was most often IDR500/Kg, this resulted in that the price of another commodity, namely lime, did not affect the land conversion from lowland rice plantations to lime.

CONCLUSION

Based on the results of research and discussion, it can be concluded that the factors that affect the land conversion from lowland rice plantations to lime plantations in Watabenua Village, Landono District, South Konawe Regency are citrus production costs. In contrast, the factors that do not affect land conversion are income, the distance between water sources to paddy fields, and other commodities prices, namely limes.

REFERENCES


