

## FACTORS CAUSED FOR RICE LAND CONVERSION IN TANAH DATAR REGENCY – INDONESIA

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**Abstract.** Population growth is a challenge for the government in terms of providing food to meet the needs of the community in the future. Expansion of agricultural area and increase in productivity is needed due to rapid population growth and increasing food demand. The purpose of this study is what factors are the cause of the conversion of paddy fields in Tanah Datar Regency. The research population of all converted paddy fields in the Tanah Datar Regency area. The sample taken was 147 respondents who had converted land and spread across all existing sub-Sub-districts. To analyze these factors using a quantitative method using multiple linear analyses using the SPSS application. The results of the study two factors cause the conversion of paddy fields, namely; income factor and land area. The income factor ( $X_4$ ) has a negative effect of -8.233 on the addition of converted land area, with  $sig t < 0.05$ . This means that every reduction in income will increase the area of converted land. The land area factor ( $X_6$ ) has a positive effect on the addition of a converted land area of 0.194 ( $sig t < 0.05$ ). This means that each addition of one unit of land area percentage will increase the converted paddy field area.

**Keywords:** income, land area, rice field, conversion

### Introduction

Population growth in Indonesia becomes a challenge for the government in providing food to meet the needs of the community in the future. The rapidly increasing population accompanied by an increase in food demand requires the expansion of agricultural land and increased production (Wilis, 2016). The existence of rice farmers is needed by the whole community because they are the producers of the food we need every day. To build a better national food security system, various challenges arise along with the development process carried out, including efforts to maintain a stable balance of food availability between needs and their fulfillment nationally, on the one hand, the increase in population will certainly have an impact on land degradation and conversion of agricultural land to non-agriculture (Arsyad, 2012).

Rice field conversion has become a serious threat to food security because of its impact on food problems that occur permanently, cumulatively, and progressively. This means that the potential loss of harvest and rice production will increase from year to year, while such rice fields have changed to other land uses and will not return to rice fields again (Nurliani, 2016). The pressure of economic factors is thought to be one of the factors that cause people to convert paddy fields to fulfill their living needs, the needs of residential areas, and other places of business (Nofita et al,

2016). The increase in settlements occurs along with the rapidly increasing population (Hermon, 2017).

If this condition is allowed to continue continuously, it will interfere with realizing sustainable agricultural development. The impacts of land conversion include threats to food security. For the food agriculture sector, land is the first and irreplaceable factor of production. In contrast to the decline in production caused by pests and diseases, drought, flooding and others are more temporary, the decline in production caused by land conversion is permanent and difficult to repair (Zulfikar, 2013). In the future, government support and firmness are needed for land conversion permits and careful planning in making sustainable policy decisions (Alijani, 2020)

The high rate of conversion of paddy fields has implications for decreasing food availability for the population so it will have an impact on decreasing food production, especially rice which can pose a threat to the food security of the population. Food security can be achieved if the available food can meet the food needs of the entire population of Indonesia. The food needs of the population are expected to increase along with the increase in population (Sunanto & Rauf, 2018). One of the areas in West Sumatra with a high population rate is also the center or central area of rice production in Tanah Datar Regency. Population growth certainly requires new land for settlement, economic land, and so on. This often causes the conversion of agricultural land into non-agricultural land, especially for paddy fields. In Tanah Datar Regency, this has happened, one of which is in the Sungai Tarab Sub-district, many rice fields have been converted into settlements, restaurants/restaurants. Communities convert their land to non-agricultural land because of the strategic location of the land to be used as a temporary place of business (Kafrinas et al., 2017). Population growth will encourage people to open new agricultural lands, causing a decrease in the carrying capacity of agricultural land. Population pressure is inversely proportional to carrying capacity. The higher the population pressure, the lower the carrying capacity. Population pressure is a serious problem in the carrying capacity of agricultural land because population pressure will encourage farming communities to increase their cultivation. So that the increase in population will reduce the carrying capacity of the land and will increase the damage (Muta`Ali, 2012). This condition requires policies on how to maintain existing paddy fields (preventing rice field conversion), analyze the carrying capacity of food agriculture areas, as well as improve agricultural infrastructure, especially irrigation networks, regulate cropping patterns under climate change, increase land productivity, especially on agricultural land that is productivity is not optimal. The developed land information system needs to be equipped with a variety of physical characteristics, tenure status, application of technology, and adaptation used, to be able to determine potential areas for food availability. To be able to find out how to analyze food sustainability in Tanah Datar Regency, the author plans to write a study with the title What are the Factors Causing Rice Land Conversion in Tanah Datar Regency - West Sumatra Province, Indonesia.

## Methods

The method used in analyzing the factors causing the conversion of paddy fields Land use maps using quantitative methods. The population in this study is all converted paddy fields in the Tanah

Datar Regency area consisting of 14 Sub-districts, while the sample is farmer's land converted from paddy fields to dry land built for example for houses, shops, or other buildings taken proportionally by purposive sampling (Barlian, 2010). Samples were taken from as many as 147 respondents who have converted land and are spread in all existing sub-Sub-districts. The data analyzed are land use maps, income data, and farmer profile data. The sources obtained are land use image analysis, interviews and questionnaires, and field surveys. To analyze the causal factors using multiple linear regression analysis.

## Results and Discussion

### Results

The increasing demand for land is unavoidable in line with population growth. Almost all human activities involve land use. Because the number and human activities are increasing rapidly, the land becomes a scarce resource so land change is unavoidable due to the increasing number of people meeting the need for land use. Factors that influence the conversion of paddy fields include internal, external, and government policies. To see the relationship between one dependent variable to more than one independent variable, multiple linear regression analysis was used. The independent variables that are thought to affect the conversion of paddy fields are farmer's income, farmer's age, farmer's education, land ownership area, number of children, and land productivity. The independent variables taken represent the factors causing internal and external land conversion (Martunisa, 2018).

The results of the regression analysis were carried out for the factors causing land conversion with selected independent variables such as age ( $X_1$ ), Education ( $X_2$ ), land price ( $X_3$ ), income ( $X_4$ ), number of children ( $X_5$ ), and land area ( $X_6$ ). The function of the causal relationship between the converted land and several causative factors in Tanah Datar Regency are as follows:

$$Y = 130.549 + 11.809X_1 + 14.741X_2 + 0.000X_3 - 8.233X_4 - 171.903X_5 + 0.194 X_6$$

Ket: Y= Area of Land Converted

The value of  $R = 0.510$  means that in general there is a fairly strong relationship between the variables of age ( $X_1$ ), Education ( $X_2$ ), Land Price ( $X_3$ ), Income ( $X_4$ ), Number of children ( $X_5$ ) and Land Area ( $X_6$ ), with conversion land. The Sig F value is 0.000 or  $< \alpha = 5\%$ , meaning that the X variable simultaneously affects the addition of converted land (Table 1).

**Table 1. Results of Multiple Regression Analysis of Factors Causing Conversion of Rice Fields in Tanah Datar Regency**

Model	Coefficients <sup>a</sup>				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	130.549	1220.339		.107	.915
X <sub>1</sub> (Age)	11.809	15.105	.060	.782	.436
X <sub>2</sub> (Education)	14.741	66.192	.017	.223	.824
X <sub>3</sub> (Land Price)	.000	.000	.056	.761	.448
X <sub>4</sub> (income)	-8.233E-5	.000	-.321	-2.433	.016
X <sub>5</sub> (Number of children)	-171.903	133.964	-.101	-1.283	.202
X <sub>6</sub> (Land area)	.194	.035	.748	5.626	.000

a. Dependent Variable: CONVERTED LAND

Age factor (X<sub>1</sub>) does not have a significant effect on the addition of converted land area, because the value of B = 11.809 with sig t > 0.05. The education factor (X<sub>2</sub>) also does not have a significant effect on the addition of converted land area, because the value of B = 14,741 with sig t > 0.05. The age factor of land price (X<sub>3</sub>) also does not have a significant effect on the addition of converted land area, because the value of B = 0.000 with sig t > 0.05. The income factor (X<sub>4</sub>) has a negative effect of -8.233 on the addition of converted land area, with sig t < 0.05. This means that every reduction in income will increase the area of converted land by 8,233 times. The number of children (X<sub>5</sub>) does not affect the addition of converted paddy fields because sig t > 0.05. The land area factor (X<sub>6</sub>) has a positive effect on the addition of a converted land area of 0.194 (sig t < 0.05). This means that adding one percentage unit of the land area will increase the converted paddy field area by 0.194 times. Based on the value of the regression coefficient ( $\beta$ ), the variable that has a dominant influence on the addition of converted land area is the variable Land Area (X<sub>6</sub>), where the regression coefficient value ( $\beta$ ) is 0.748. it can be concluded that the variable land area has the most dominant influence on the addition of converted land area.

### Discussion

In general, there is a fairly strong relationship between the variables of Age, Education, Land Price, Income, Number of Children, and Land Area, with the conversion of paddy fields. The Sig F value is 0.000 or < from = 5%, meaning that hypothesis H<sub>0</sub> is rejected, and H<sub>1</sub> is accepted, namely, the X variable simultaneously affects the addition of converted land. Income factors affect land conversion. According to Nurliani (2016), most farmers feel that the productivity of their paddy fields is decreasing so the farmers assume that their fields are no longer economically profitable. This factor is one of the drivers for them to convert their paddy fields. In addition, according to Irawan (2004) that land conversion starts from the demand for agricultural commodities, especially food commodities which are less elastic to income compared to non-agricultural commodities.

Therefore, income affects increasing the income of the population, which tends to cause an increase in demand for non-agricultural commodities at a higher rate than the demand for agricultural commodities. A further consequence is that because the need for land to produce each commodity is a derivative of the demand for the commodity in question, economic development that leads to an increase in income will lead to an increase in demand for land for non-agricultural activities at a faster rate than the increase in demand for land for agricultural activities.

### Conclusions

The factors causing the conversion of paddy fields in Tanah Datar district are two factors, namely income and land area. The income factor ( $X_4$ ) has a negative effect of -8.233 on the addition of converted land area, with sig  $t < 0.05$ . This means that every reduction in income will increase the area of converted land by 8,233 times. The land area factor ( $X_6$ ) has a positive effect on the addition of a converted land area of 0.194 (sig  $t < 0.05$ ). This means that adding one percentage unit of the land area will increase the converted paddy field area by 0.194 times. In general, there is a fairly strong relationship between the variables of Age, Education, Land Price, Income, Number of Children, and Land Area, with the conversion of paddy fields. The Sig F value is 0.000 or  $<$  from  $= 5\%$ , meaning that it simultaneously affects the addition of converted land. Factors of age, education, number of children, and land prices do not have a significant effect on the addition of converted land area.

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