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Analysis of Factors Affecting Rice Farming Production in Ulu Ogan District, OKU District

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A B S T R A C T

Ogan Komering Ulu Regency is a district that has great potential for agricultural businesses, especially rice farming. For rice production in South Sumatra Province, Ogan Komering Ulu district in 2020 occupies the 12th position out of 17 districts/cities, with a total production of 16,807.12 tons of dry milled grain (kg). Ogan Komering Ulu Regency has 13 sub-districts which are rice-producing areas. The Ogan Komering Ulu Regency Government continues to strive to increase the production and productivity of rice commodities in its area. The increase in rice production in Ogan Komering Ulu Regency is not only to meet regional needs but is expected to contribute to increasing national rice production. In 2020 the highest total rice harvested area in Ogan Komering Ulu Regency is in Ulu Ogan District, which is 1,690 ha, with dry milled grain production (kg) of 9,464 tons. So that it can be said, Ulu Ogan District is a food barn for Ogan Komering Ulu Regency. Rice production is the amount of rice obtained at the time of post-harvest. Yield will be affected by land area, fertilizer, and labor. This rise and fall in production results can be caused by several factors that are not precise enough so the production of lowland rice is not optimal. Therefore, there is a need for further analysis related to the factors that influence the production of lowland rice farming in Ulu Ogan District, Ogan Komering Ulu Regency. This study aimed to analyze the factors that influence the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu Regency. This research was conducted in Ulu Ogan District, Ogan Komering Ulu Regency. Sampling in this study was done by a simple random sampling method with 65 farmers as respondents. The variables measured in this study were land area, urea fertilizer, labor, number of seeds, and pesticides. The production model used is the Cobb-Douglas model regression analysis. To see the effect of each production factor on the resulting production using multiple linear regression analysis simultaneously the variables of land area, urea fertilizer, labor, number of seeds, and pesticides affect rice production in Ulu Ogan District, Ogan Komering Ulu Regency. Individually the variables of land area and the number of seeds have a significant effect on rice production factors.

1. INTRODUCTION

1.1. Research Background

Indonesia is a country rich in natural resources, both water resources, land resources, forest resources, marine resources, and biological resources. This natural wealth is one of the basic capital for the implementation of Indonesia's economic development. The agricultural sector is one of Indonesia's natural resources that can be optimized with one of the sub-sectors including rice plants [1]. Rice is a type of grain plant (cereal), with the grass family (Poaceae) of the genus Oryza. Rice can be planted in the fields or the fields. Including lowland rice are rendengan rice, gadu rice, upland rice rancah, lebak rice, seepage rice, and others. Lowland rice is found in a variety of climates that are far more diverse than other types of plants [2]

The size of the rice farming income received by residents in the village is influenced by revenues and production costs. If the production and selling price of paddy rice are higher, it will increase revenue. If the cost of production is higher than the revenue it will cause business losses for farmers. The farming analysis is very necessary to run a business, this is to find out whether the farming that is being run provides benefits or not [3]

Ogan Komering Ulu Regency is a district that has great potential for agricultural businesses, especially rice farming. For rice production in South Sumatra Province, Ogan Komering Ulu district in 2020 occupies the 12th position out of 17 districts/cities, with a total production of 16,807.12 tons of kg. Ogan Komering Ulu Regency has 13 sub-districts which are rice-

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producing areas. The Government of Ogan Komering Ulu Regency continues to strive to increase the production and productivity of rice commodities in its area. The increase in rice production in Ogan Komering Ulu Regency is not only to meet regional needs but is expected to contribute to increasing national rice production.

\The following presents data on harvested area, production, and productivity of lowland rice by sub-district in Ogan Komering Ulu Regency in 2020 [4]

Table 1. Harvested Area, Production, and Productivity of Rice Paddy by District in Ogan Komering Ulu Regency in 2020

Subdistrict	Harvest Area (ha)	Production (ton)	Productivity (quintal/ha)
Lengkiti	63	353	56.03
Sosoh Buay Rayap	35	196	56.00
Pengandonan	1.622	9.085	56.01
Muara Jaya	960	5.436	56.62
Semidang Aji	1.324	7.421	56.05
Ulu Ogan	1.690	9.464	56.00
Peninjauan	14	75	53.57
Sinar Peninjauan	631	3.534	56.01
Lubuk Batang	225	1.256	55.82
Lubuk Raja	223	1.240	55.60
Baturaja Timur	205	1.148	56.00
Baturaja Barat	22	123	55.91
Kedaton Peninjauan Raya	465	2.555	54.95
Amount	7.879	41.886	53.16

Source: Ref. [4]

Table 1 shows that in 2020 the highest total rice harvested area in Ogan Komering Ulu Regency is in Ulu Ogan District, which is 1,690 ha, with dry milled grain production of 9,464 tons. So that it can be said, Ulu Ogan District is a food barn for Ogan Komering Ulu Regency. Harvested area, rice production, and productivity in Ulu Ogan District from 2018 to 2020 are shown in Table 2.

Table 2. Harvested area, rice production, and productivity in Ulu Ogan District Year 2018 – 2020

Year	Harvest Area (ha)	Production (ton)	Productivity (quintal/ha)
2018	2.774	15.534	56.00
2019	2.376	13.306	56.00
2020	1.690	9.464	56.00

Source: Ref. [4]

Table 2 shows that the harvested area for lowland rice in Ulu Ogan District has decreased in the last three years and has resulted in a decrease in rice production. Rice production is the amount of rice obtained at the time of post-harvest. Yield will be affected by land area, fertilizer, and labor. This rise and fall in production results can be caused by several production factors that are not appropriate so lowland rice production is not optimal [5]. Therefore, there is a need for further analysis related to the factors that influence the production of lowland rice farming in Ulu Ogan District, Ogan Komering Ulu Regency.

The formulation of the problem in this study is what factors affect the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu Regency. The purpose of this study was to analyze the factors that influence the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu Regency. This research is expected to be useful as information material about the factors that influence the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu Regency.

1.2. Literature Review

1.2.1. The Concept of Rice Paddy Farming

Farming is a science that studies how farmers determine, organize and coordinate the use of production factors effectively and efficiently to provide maximum income [6]. Factors of production are all things that are input directly or indirectly in the production process [7]. According to Ref. [8], farming is the study of how farmers manage inputs or production factors (land, labor, capital, technology, fertilizers, seeds, and pesticides) effectively, efficiently, and continue to produce high production. so that their income increases. The farming system is an open system, where various inputs (nutrients, water, information, etc.) are received from outside and part of the output leaves the system for consumption or sale [6].

To support the success of farming, it is necessary to continuously supply agricultural raw materials in sufficient quantities. Farming development is highly dependent on the availability of resources. Four resources are important production factors in farming, 1) land, including quantity (area) and quality, 2) human labor, 3) capital for purchasing variable inputs and 4) farmer management skills [9].

1.2.2. The conception of Factors of Production

According to Ref. [10], in conducting efficient farming, a producer will make the right combination of several production inputs to produce optimal efficiency both economically and physically. The nature of the production function is assumed to be subject to a law called The Law of Diminishing Returns or the law of diminishing returns [11]. Is a theory in economics that explains the right proportion of inputs to get maximum output. If the use of one type of input is increased while the other inputs are constant, then the additional output generated from each unit of input added will first increase but then decrease if the input continues to be added.

Inputs or factors of production in the agricultural sector are all sacrifices given to plants so that these plants can grow well and produce optimally. These production factors are known as production factors or production sacrifices and greatly determine the size of the product obtained [12].

Production factors in farming are generally classified into two groups, namely: 1) biological factors, such as agricultural land with various levels of fertility, seeds, varieties of fertilizers, medicines, weeds, and others; 2) socioeconomic factors, such as production costs, prices, labor, education level, agricultural status, availability of credit and so on [13]. Several important production factors in lowland rice farming include land area, seeds, fertilizers, pesticides, and labor.

The area of land cultivated by farmers is the potential or capital of farmers in farming. The size of the farmer's income from his farm is determined by the area of the land he cultivates because the area of the cultivated land can affect the production per unit area [14]. The land is one of the determinants of the high and low production produced. The wider the area of land used, of

course, the greater the opportunity to produce greater production [15].

Seeds are plant seeds that are used for farming purposes and have an agronomic function. According to Law Number 22 of 2019 concerning Sustainable Agricultural Cultivation Systems, plant seeds are plants or parts thereof that are used to reproduce and/or reproduce plants. Seed classification applies to seeds derived from generative or vegetative propagation but does not apply to hybrid seeds. Hybrid seed propagation only produces the first generation of seeds or known as F1. These seeds are not recommended to be bred to the next level because they will experience segregation or a decrease in superior characteristics and are not the same as the parent [16].

Fertilizer is a material added to planting media or plants to meet the nutrient needs of plants so that they can produce well. Fertilizer plays a role in replacing one or more of the elements that have been absorbed by plants. So fertilizing means adding nutrients to the soil or plants. Based on the elements they contain, fertilizers are divided into two groups, namely macro fertilizers and micro fertilizers. In general, based on their origin, fertilizers are divided into two groups, namely inorganic fertilizers (such as Urea (N), TSP or SP-36 (P fertilizer), and KCL (K fertilizer), as well as organic fertilizers (such as manure, compost, humus and green manure [17].

Pesticides are toxic and bioactive chemical substances that are used to kill or control various pests, including insects, fungi, and weeds. Pesticides come from the word pest which means plant-disturbing organisms and cide which means deadly or poison [18].

Labor in farming is one of the main input factors. Labor in agriculture can be obtained from within and outside the family. Workers outside the family can be obtained using wages or labor gatherings. Meanwhile, family workers are workers who come from farmer households, such as wives, children, or relatives who live in the same house as the farmer's household. The use of this workforce is expressed as an outpouring of labor. The outpouring of labor is the amount of effective labor used. The size of the workforce can be expressed by working days (HOK), which is the amount of work devoted to the entire production process as measured by the size of an adult male working 8 hours of work in one day [19].

2. MATERIALS AND METHOD

This research was conducted in Ulu Ogan District, Ogan Komering Ulu Regency. The research location was determined purposively with the consideration that this sub-district has the highest harvested area and rice production in Ogan Komering Ulu Regency. This research was conducted from November to December 2021.

Data collection methods are observation and interviews with questionnaires as a data collection tool. The data obtained in this study include primary data and secondary data. Primary data were obtained from direct interviews at the research location with respondents using a questionnaire that had been prepared with the aim of the study. Secondary data were obtained from agencies related to this research such as the Department of Agriculture, and the Central Bureau of Statistics of Ogan Komering Ulu Regency as well as from literature and other supporting sources.

The sampling method was simply random, where from 7 villages in Ulu Ogan District, Ogan Komering Ulu Regency, 2 villages were taken, with the criteria for the sample villages being the highest and the lowest in land area and production, namely Ulak Lebar and Gunung Tiga Villages. The number of farmers in Ulak Lebar Village is 161 people and Gunung Tiga Village is 102 people, bringing the total number of farmers in these two villages to 263 people.

Respondents were taken randomly, with the sample for this study taken 25% of a total of 263 farmers, namely 65 people, with details of 40 people from Ulak Lebar Village and 25 people from Gunung Tiga Village. Lowland rice farming is an activity to manage and cultivate paddy fields with irrigation planted with rice, to obtain crop yields.

Types of rice farming :

1) Rice fields in this case are irrigated rice fields
2) Production is the result of irrigated rice farming in Ulu Ogan District Ogan Komering Ulu Regency expressed in tons/ha
3) Production factors are factors that affect the production of irrigated paddy rice, including land area, seeds, fertilizers, pesticides, and labor.
4) The area of land is a place for growing crops, livestock, and farming a total of hectares
5) Urea fertilizer is an inorganic fertilizer that is useful for increasing sodium level soil in kg
6) Labor, namely the amount of work devoted to the entire production process measured by the size of the work of adult men with 8 hours of work in one day expressed in working days (HOK)
7) The number of paddy rice seeds is lowland rice plants that are 3-4 weeks old and used to multiply and/or breed rice plants in kg
8) Pesticides are chemical substances that are toxic and bioactive and are used to kill or control various pests, including insects, fungi, and weeds that grew in the fields in ml.

The Cobb Douglas production function model used in this study has more than one independent variable so the analysis uses multiple linear regression analysis with the following general form:

$$\text{Ln } Y = \beta 0 + \beta 1 \text{LnX1} + \beta 2 \text{LnX2} + \beta 3 \text{LnX3} + \beta 4 \text{LnX4} + \beta 5 \text{LnX5} + \mu$$

Explanation :
Y = Rice production (kw)
0 = Constant
(n+1) = Regression Coefficient
X1 = land area (Ha)
X2 = Urea fertilizer (kg)
X3 = labor (Working Days = HOK)
X4 = number of seeds (kg)
X5 = pesticide (ml)
μ= usage error

To prove whether or not there is a relationship between production factors and lowland rice production, the following analysis is used:

2.1. Coefficient of Determination Test (R^2)

The coefficient of determination to determine the accuracy of the model used the R2 coefficient value, while to determine the

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contribution of more than two independent variables, adjusted R^2 was used. To find out how much influence the estimating variables have on production, as well as to test The accuracy of the model used adjusted R^2. The adjusted R^2 value ranges from 0 to 1, the greater the adjusted R^2 value (closer to 1), the greater the influence of the predictor variables on production. On the other hand, the closer to 0, the smaller the effect of the predictor variables on production [20].

The formula for calculating R^2 is [21]:
$R^2 = ESS/SS$
Explanation :
ESS = Sum of regression squares
TSS = Sum of the total squares which is the total variation
Y TSS = ESS+RSS
RSS= Sum of the squares of the residue

2.2. F . test

Used to test the effect of the independent variables together on the variable of lowland rice production. According to Ref. [20].

The hypothesis used in the F test is formulated as follows:
Ho : b1 = 0 (no effect)
Ha: there is at least one, b1 0 (there is influence and significance)
With a significance level of = 0.05 then:
1) If the value of Sig <: Ho is rejected and Ha is accepted, it means that the independent variables together have a significant effect on the dependent variable.
2) If the value of Sig >: Ho is accepted and Ha is rejected, it means that the independent variables together have no significant effect on the dependent variable.

2.3. t-test

Furthermore, to find out how much influence the significance level of the independent variable has on the dependent variable partially or individually by using the t-test.

Testing Criteria of t-Test:
1. If the value of t count > t table, then H0 is rejected and H1 is accepted, meaning that there are factors that affect the production of lowland rice.
2. If the value of t count t table, then H0 is accepted and H1 is rejected, meaning that the above factors do not affect lowland rice production

3. RESULT AND DISCUSSION

3.1. Condition of the research area

Ulu Ogan Subdistrict, Ogan Komering Ulu Regency administratively consists of 7 villages with an area of about 23,600 Ha. In general, the topography of Ulu Ogan District covers 80 percent of hilly land, while the remaining 20 percent is flat land and swamps. The majority of the population of Ulu Ogan sub-district make a living as farmers. The distance from Ulu Ogan District to the district capital (Baturaja City) is about 65 Km.

3.2. Population Situation

According to BPS data in 2021, the population in Ulu Ogan District is 8,965 people, with a composition of 5,545 males and 4,380 females. Based on the total population and area, it can be seen that the average population density in Ulu Ogan District is 37.99 people per km^2.

3.3. Characteristics of Respondents

The characteristics of the respondent farmers are a general description of the respondent's background that can affect farming. The farmers selected as respondents were 65 rice farmers in Ulak Lebar Village and Gunung Tiga Village, Ulu Ogan District, Ogan Komering Ulu Regency. The identity of the respondents studied included age, education level, number of family members, and length of farming. The variables thought to affect the production of lowland rice farming in Ulu Ogan District, Ogan Komering Ulu Regency consist of land area (Ha), urea fertilizer (Kg), labor (HOK), number of seeds (Kg) and pesticides (ml). The production function model used in
This research is a Cobb-Douglas production function model. This model was chosen because it has better statistical criteria than the multiple linear production function model. Regarding the Cobb-Douglas production function, in this analysis, the data is transformed into ln form (normal logarithm) so that it can be linearly regressed. The tool for performing data analysis is the IBM SPSS Statistics V.26 software. After being transformed into Ln form, it is analyzed using multiple linear analysis, the results obtained are as follows:

3.4. Regression Function Model

The multiple linear regression function model of the factors that affect the production of lowland rice farming are:
Ln Y = 0.232 + 0.849 Ln X1 + 0.056 Ln X2 + 0.311 Ln X3 + 0.441 Ln X4 + 0.002 Ln X5

Y = Rice production (kw)
X1 = land area (Ha)
X2 = Urea fertilizer (kg)
X3 = labor (Working Days = HOK)
X4 = number of seeds (kg)
X5 = pesticide (ml)

Analysis of a regression model can include several things, namely the coefficient of determination (R2), simultaneous significance test (F test), and individual parameter significance test (t-test). Besides based on the results of the regression model analysis, efficiency calculations were also carried out.

3.5. Coefficient of Determination (R^2)

The coefficient of determination is used to measure the ability of the model to explain the dependent variations, the value of the coefficient of determination is between zero and one. The higher the value of the coefficient of determination, the more independent the independent variable can provide the information needed to explain the variation of the dependent variable. After being calculated using the multiple linear regression method, it can be seen that the magnitude of the factors that affect the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu (Table 3).

Based on Table 3, it can be seen that the coefficient of determination of Adjusted R square (R2) is 0.810 or 81%. This shows that the dependent variable (rice production) of 81% is explained by the variants of the independent variables in the form of land area, urea fertilizer, labor, number of seeds, and pesticides. While the remaining 19% is explained by other variables that are not included in this research model. These other

variables include rainfall, humidity, air temperature, other chemical fertilizers (besides urea), organic fertilizers, and so on.

Table 3. Results of the Coefficient of Determination (R^2)

Model Summary					
Model	R	R Square	Adjusted R Square	Std. error of the Estimate	Durbin-Watson
1	.908a	.825	.810	.24445	1.841
a. Predictors: (Constant), Pesticide (X5), Urea Fertilizer (X2), Labor (X3), number of seeds (X4), land area (X1)					
b. Dependent Variable: rice production (Y)					

Source: Primary Data Analysis, 2021[22]

3.6. Simultaneous Significance Test (F Test)

This F test is used to see the effect of the independent variables, namely land area, urea fertilizer, labor, number of seeds, and pesticides simultaneously (simultaneously) on the production of lowland rice farming in Ulu Ogan District, Ogan Komering Ulu Regency. The results of the F test can be seen in Table 4.

Table 4. Simultaneous Significance Test (Test F)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.573	5	3.315	55.466	.000b
	Residual	3.526	59	.060		
	Total	20.098	64			
a. Dependent Variable: rice production (Y)						
b. Predictors: (Constant), pesticides (X5), urea fertilizer (X2), Labor (X3), number of seeds (X4), land area (X1)						

Based on Table 4, it can be seen that the probability value is 0.000 which means it is smaller than ($\alpha = 0.05$). This shows that H0 is rejected and H1 is accepted. This means that the variables of land area, urea fertilizer, labor, number of seeds, and pesticides together affect the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu Regency.

3.7. Individual Parameter Significance Test (t-Test)

The t-test is intended to determine whether each independent variable influences the dependent variable. That is to find out how far the land area, urea fertilizer, labor, number of seeds, and pesticides have an individual effect on rice production. The results of the individual parameter hypotheses can be seen in Table 5.

Based on the results of the regression analysis, the significance value (Sig.) of the land area is 0.00, which is smaller than (= 0.05) so it is significant. This means that land area has a significant effect on rice production in Ulu Ogan District. The coefficient value of the land area variable has a positive value of 0.849. If there is a 1% increase in land area, it can increase rice production by 0.849%. The area of land that is used optimally in lowland rice farming will increase the amount of lowland rice production in Ulu Ogan District, Ogan Komering Ulu Regency. Based on regression analysis, the urea fertilizer variable has a significance value of 0.755 which is greater than (= 0.05) so it is not significant. This means that the urea fertilizer variable has no significant effect on rice production in Ulu Ogan District, Ogan Komering Ulu Regency. This is because the use of chemical fertilizers, especially urea fertilizers, is already saturated in the research area.

Based on regression analysis, the labor variable has a significance value of 0.115 which is greater than ($\alpha = 0.05$) so it is not significant. This means that the labor variable has no significant effect on rice production in Ulu Ogan District, Ogan Komering Ulu Regency. This is due to the use of labor that has not been optimal in rice farming.

Table 5. Individual Parameter Significance Test Results (t-test)

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.232	.983		.236	.814		
	land area(X1)	.849	.109	.692	7.762	.000	.374	2.672
	urea fertilizer (X2)	.056	.178	.027	.313	.755	.413	2.419
	Labor (X3)	.311	.194	.094	1.599	.115	.855	1.169
	number of seeds (X4)	.441	.154	.233	2.869	.006	.450	2.222
	pesticide (X5)	.002	.036	.003	.049	.961	.854	1.170
a. Dependent Variable:rice production (Y)								

Source: Ref. [22]

Based on regression analysis, the variable number of seeds has a significance value of 0.00 which is smaller than (= 0.05) so it is significant. This means that the variable number of seeds has a significant effect on rice production in Ulu Ogan District, Ogan Komering Ulu Regency. The coefficient value of the variable number of seeds is positive at 0.441. If there is an increase of 1% in the number of seeds, it can increase the production of lowland rice by 0.441%. The seeds used optimally in lowland rice farming will increase the amount of lowland rice production in Ulu Ogan District, Ogan Komering Ulu Regency.

Based on regression analysis, the pesticide variable has a significance value of 0.961 which is greater than (= 0.05) so it is not significant. This means that the pesticide variable has no significant effect on rice production in Ulu Ogan District, Ogan

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Komering Ulu Regency. This is because the use of pesticides has not been following the recommended dose to overcome pests and diseases.

3.8. Classical Assumption Deviation Test

3.8.1. Normality Test

The residual normality test aims to test whether, in the regression model, the dependent variable and the independent variable are both normally distributed or not. A good regression model is to have a normal residual distribution or close to normal. According to the results of the regression analysis, the following results were obtained (Figure 1). Figure 1 shows that the distribution of the plots is around and along the 450 lines. Thus, it shows that the data on the variables are normally distributed.

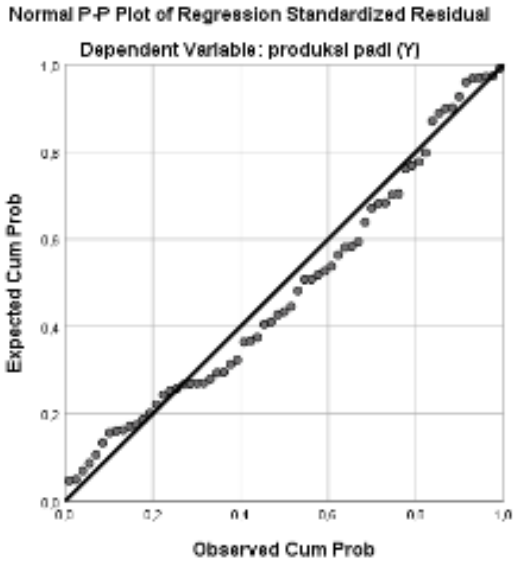

Figure 1. Distribution of Plots on the Normality Test of Data

3.8.2. Multicollinearity Test

To determine the presence or absence of Multicollinearity, it can be seen in the Tolerance and VIF (Variance Inflation Factor) values, namely: if the tolerance value is > 0.10 and VIF < 10, it means that there is no Multicollinearity in the study, and vice versa. The results of the multicollinearity test can be seen in Table 6.

Table 6. Multicollinearity Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.232	.983		.236	.814		
	land area(X1)	.849	.109	.692	7.762	.000	.374	2.672
	urea fertilizer (X2)	.056	.178	.027	.313	.755	.413	2.419
	Labor (X3)	.311	.194	.094	1.599	.115	.855	1.169
	number of seeds (X4)	.441	.154	.233	2.869	.006	.450	2.222
	pesticide (X5)	.002	.036	.003	.049	.961	.854	1.170

a.Dependent Variable: rice production (Y)

Source: Ref. [22]

Based on the results of the analysis, it is known that the tolerance value for the land area (X1) is 0.374, urea fertilizer (X2) is 0.413, labor (X3) is 0.855, the number of seeds (X4) is 0.450 and pesticides (X5) is 0.854. The VIF value for the land area (X1) is 2.672, urea fertilizer (X2) is 2.419, labor (X3) is 1.169, several seeds (X4) is 2.222, and pesticides (X5) is 1.170. These results indicate that no variable has a tolerance value of less than 0.100 and no variable has a VIF value greater than 10, which means that in this study there is no multicollinearity in the regression.

3.8.3. Heteroscedasticity Test

The heteroscedasticity test is a condition where the variance and confounding error are not constant for all independent variables. A good regression model is that there is no heteroscedasticity. The way to find out whether there is heteroscedasticity in a model can be seen from the Scatter plot pattern of the model. The scatter plot pattern of the regression model of this study is shown in Figure 2.

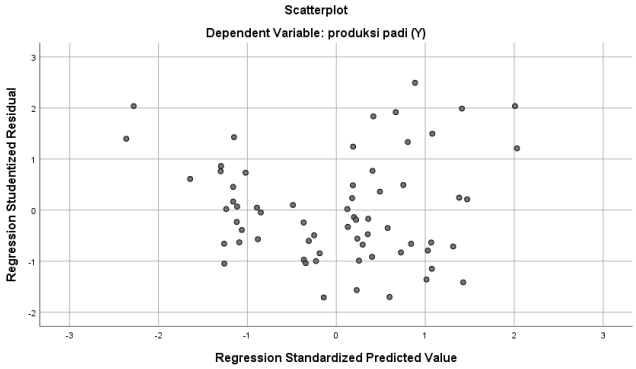

Figure 2. Heteroscedasticity Test Results

Based on Figure 3, it can be seen that the points spread randomly and are spread both above and below zero, the data points do not collect just above or below, and the spread of data points does not form a wavy pattern that widens then narrows and widens again, and the spread of points -data points are not patterned. So it can

be concluded that this multiple linear regression model is free from the classical assumption of heteroscedasticity.

Lowland rice farming in Ulu Ogan District, Ogan Komering Ulu Regency is carried out to obtain income and meet the needs of daily life. Rice farming in Ulu Ogan is carried out for approximately 120 planting days or four months.

In this study, the individual land area variable significantly affected the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu Regency. Affected land area significantly because the larger the land area, the more rice paddies that can be planted, so the amount of production will increase. This is supported by the research of [24]. which shows that land area has a significant effect on rice production. This means that the larger the area planted, the higher the production.

The urea fertilizer variable in this study individually had no significant effect on rice production in Ulu Ogan District, Ogan Komering Ulu Regency. This indicates that the addition of the amount of urea fertilizer does not affect the production of lowland rice. The reason is that the use of fertilizers to add N elements is not following the recommendations of the Agricultural Extension Center at the research site. The recommended use of urea fertilizer from the agricultural extension center (BPP) Ulu Ogan District is 200 Kg of urea, while the use by respondent farmers is 123.39 Kg. The principle of correct fertilization is to add elements that are lacking in the soil but are needed by plants [6]. The above conditions indicate that the use of urea fertilizer is not optimal and is not following the recommendations.

Labor in farming is one of the main input factors. Labor in agriculture can be obtained from workers inside and outside the family [19]. Labor is one of the determining elements, especially for farming which is very dependent on the season. The scarcity of labor causes delays in planting time it affects plant growth, productivity, and product quality. In this study, the individual labor variable had no significant effect on rice production in Ulu Ogan District, Ogan Komering Ulu Regency. This is due to the lack of available labor so the production process of lowland rice farming is less than optimal and does not run faster. The results obtained in this study are in line with the results of previous research by Ref. [23].

The variable number of individual seeds has a significant effect on rice production in Ulu Ogan District, Ogan Komering Ulu Regency. The number of seeds has a significant effect because the more seeds are used, the production of lowland rice will increase. This is in line with the results of previous research, [24], which showed that the individual variable number of seeds had a significant effect on lowland rice production.

The results showed that pesticides had no significant effect on rice production in Ulu Ogan District, Ogan Komering Ulu Regency. This condition means that the addition of pesticides does not affect the production of lowland rice. According to Ref. [25], the use of pesticides must be

Pay attention to the five principles, namely the right target, the right type, the right time, the right dose, and the right way. In the application of pesticides, farmers usually do it as prevention or before pests attack. It is advisable to apply pesticides when plant pest organisms (OPT) reach the control threshold.

Based on the description above, it can be seen that not all individual factors of lowland rice farming production significantly affect lowland rice production in Ulu Ogan District, Ogan Komering Ulu Regency. If together (simultaneously) the production factors (land area, urea fertilizer, labor, number of seeds, and pesticides) affect rice production in Ulu Ogan District, Ogan Komering Ulu Regency.

4. CONCLUSION

Based on the results of the study, it can be concluded that simultaneously (simultaneous) production factors (land area, urea fertilizer, labor, number of seeds, and pesticides) have a significant effect on lowland rice production in Ulu Ogan District, Ogan Komering Ulu Regency. individually, the production factors that significantly affect the production of lowland rice in Ulu Ogan District, Ogan Komering Ulu Regency are land area (X1) and the number of seeds (X4). The things that can be suggested from the results of this study are that it is recommended that agricultural intensification (addition of land area) be carried out so that rice production can be further increased. as recommended.

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