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OPTIMIZATION THE USE OF PRODUCTION FACTORS AND RICE FARMING INCOME

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ABSTRACT

This study aimed to analyze lowland rice farming income and analyze the optimization of the use of production factors to achieve lowland rice farming efficiency in Telaga district, Gorontalo regency. This study was conducted from September to October 2021 by survey and interview, while the sampling used a simple random method. The data sources were both primary and secondary in type, while the data analysis used to examine the rice farming income used qualitative descriptive analysis. Further, the means to examine the optimization level of the production factor usage employed Cobb-Douglas analysis and Product Marginal Value. The findings showed the income average for a growing season reached Rp. 37.217.960 ha./GS., while the analysis results revealed the Revenue of Cost Ratio for farming achieved 2.14. Hence, the area is deemed feasible. Land area (X1), Seeds (X2), Fertilizer (X3), Pesticides (X4), and Labor (X5) had simultaneous effects on the income, but partially only fertilizer (X3) variable did not effect on the income. The use of production factors of land area, pesticides, and labor was not optimal because the optimization value obtained NMPxi < 1, which means the need for reuse. Meanwhile, the use of seeds and urea fertilizer was not optimal yet because the optimization value obtained NMPxi > 1, which means its usage needs improving to provide optimal interest for farmers at the research site.

Keywords: Efficiency; Income; Optimazation; Production factors; Rice farming.

INTRODUCTION

Gorontalo Province has an Agropolitan concept to develop agriculture to meet the food needs of the population. In general, the people in Gorontalo make a living as farmers because agriculture is the main priority sector in the development and improvement of economic welfare in the Gorontalo region (Department of Agriculture Gorontalo Province, 2020). The rice harvested area in Gorontalo Province for the January–September 2018 period was 43,956 hectares. Taking into account the potential until December 2018, the harvested area in 2018 is around 51,765 hectares. Rice production in 2022 is 240.13 thousand tons of GKG, an increase of 5.74 thousand tons or 2.45% compared to rice production in 2021 which amounted to 234.39 thousand tons of GKG (BPS Gorontalo Province, 2023).

Agricultural development aims to improve the quality and yield of production, increase the income and standard of living of farmers, expand employment and business opportunities in promoting equity, and the dynamics of rural economic growth which in turn will provide opportunities for the welfare of people's lives more, especially in rural areas. One source of food which is also a staple food, this commodity needs serious attention along with the increasing need for food as a result of population growth (Risna and Yulianti, 2018).

Gorontalo regency is one of the regions with the agricultural sector as a leading sector and is the top five of the largest contributing regions of rice in Gorontalo Province. which are spread in 2 parts, namely the southern part, including the districts of Telaga, Telaga Biru, Limboto, West Limboto, and the Tiber; Whereas the north it includes Batudaa and Bongomeme Districts. The area of Gorontalo regency is 2,125 square kilometers (BPS, 2020). With a fairly large productive land, rice fields/wet 13,087 ha., dry land 48,479 ha.. In addition, the area of land used for horticultural plants/other is 9,846 ha..

According to Sinabang *et al.* (2021), to increase the productivity of paddy farming, the allocation of production facilities (input) plays an important role in efforts to achieve production (output) in accordance with desired destination. Increases or decreases in production can occur simultaneously with changes in production inputs used. The gap between real productivity and potential productivity that is allegedly suspected because the farmers are still facing constraints particularly related to the use of production inputs.

For farmers farming activities are carried out not only to increase production but how to increase income using factors of production as well as possible. It often occurs when the addition of factors of production does not provide the expected income by farmers in Telaga District. So it is necessary to optimize the use of factors of production and revenue of lowland rice farming in Telaga district, Gorontalo regency.

The purpose of the study was to analyze the income lowland rice farming, and analyze the effect of the use of production factors on the production of lowland rice farming in Telaga district, Gorontalo regency. This study also conducted an analysis of the optimization of the use of production factors to assess the level of efficiency of lowland rice farming in Telaga district, Gorontalo regency.

METHOD

Location and Time of Research

This research was conducted in Telaga district, Gorontalo regency, and the selection of research locations was carried out purposively (deliberately) based on location considerations that Telaga district is one of the rice production centers in Gorontalo regency. This research was conducted from September to October 2021.

Sampling

Determination of the population is an important stage in research. The population can provide useful information or data for a study (Sugiyono, 2017). The population in this study were 769 farmers, namely all groups of rice farmers in Telaga district, Gorontalo regency. In this study, the sampling technique used by the author is a probability sampling technique using was simple random sampling method. The definition of simple random sampling proposed by Sugiyono (2017) is the taking of sample members from the population that is carried out randomly without regard to the strata that exist in the population. the number of samples taken in this study were 60 samples.

Data Collection

The technique used in collecting data in this study is the technique of observation, distributing and filling out questionnaires, and interviews. The primary data were obtained directly from lowland rice farmers in the form of farmer's age, education level, length of farming, number of family dependents, lowland rice farming production, lowland rice farming costs, and production factors (land area, seeds, fertilizers, pesticides, labor). Collected by using the survey method through observation, and live interviews with farmers. Secondary data itself is obtained indirectly, through local institutions or agencies and others, which is carried out on objects and aspects of research related to and supporting the fulfillment of research data needs.

Data Analysis

Analysis of the data used in answering the first objective is to use analysis of production costs, revenue, and income. Meanwhile, to find out the optimization, it is analyzed using the Cobb-Douglas function. By using the Cobb-Douglas formula, the analysis is used to determine how the effect of the variables of land area, seeds, fertilizers, pesticides, and labor on the variable level of production. To analyze the calculation of determining the level of optimization of production inputs used in lowland rice farming from the calculation of price efficiency (Soekartawi, 2002; Rahim and Hastuti, 2008):

1. Analysis of Rice Farming Production Costs

Production costs can be calculated using the following formula:

TC = TFC + TVC

Information:
TC = Total Cost
TFC = Total Fixed Cost
TVC = Total Variable Cost

2. Farm Revenue and Income

Revenue and income can be calculated using the following formula

TR = P x Q

Information:
TR = Total Revenue (Rp)
P = Production price (Rp/Kg)
Q = Quantity (Kg)

I = TR – TC

Information:
I = Farming Income (Rp)
TR = Total Revenue (Rp)
TC = Total Cost (Rp)

Meanwhile, to determine the feasibility of lowland rice farming, the R/C Ratio formula according to Soekartawi (2002) can be used as follows:

$$R/C = \frac{TR}{TC}$$

With criteria if:
R/C > 1 So the farming is feasible (profitable)
R/C = 1 So the farming does not experience a loss or profit, where every one rupiah issued will provide an income of one rupiah as well (break even).
R/C < 1 So the farming does not experience a loss or profit, where every one rupiah that is issued will provide an income of one rupiah as well (detrimental)

The purpose of the feasibility study for rice farming, among others, is to see how the cost and benefit values change at a higher average discount rate and at a lower discount rate, providing an overview of the magnitude of the effect.

Cobb-Douglas function

The exponential production function or Cobb-Douglas has been widely used in empirical studies of the production function, especially since Charles W. Cobb and Paul H. Douglas started using it in the late 1920s. This function or equation involves two or more variables, whichever one variable is referred to as the dependent variable or described (dependent variable), and the other is referred to as the independent variable or explaining (independent variable) (Imran and Indriani, 2022).

This analysis is used to determine how the effect of the variable level of production is related to the variables of land area, seed, fertilizer, pesticide, and labor, using the formula (Imran and Indriani, 2022).

$$\mathbf{Y = \alpha . X_1\beta_1 . X_2\beta_2 . X_3\beta_3 . X_4\beta_4 . X_5\beta_5 . e}$$

To facilitate the estimation of the above equation, the equation is converted into a multiple linear form by means of a logarithm of the equation, so that it becomes :

$$\mathbf{Log\ Y = log\alpha + \beta_1 logX_1 + \beta_2 logX_2 + \beta_3 logX_3 + \beta_4 logX_4 + \beta_5 logX_5 + e}$$

Information:

Y = Lowland rice farming production in one harvest period (Kg)
α = constant
X_1 = land area (Ha)
X_2 = Seeds used in one production (Kg)
X_3 = Fertilizer used in one production (Kg)
X_4 = Pesticide used in one production (Liter)
X_5 = The amount of labor used in one production (HK)
e = error
$\beta_1 - \beta_5$ = Elasticity value

Price Efficiency (NPM)

To analyze the calculation of determining the level of optimization of production inputs used in lowland rice farming from the calculation of price efficiency. According to Soekartawi (2002) price efficiency is achieved if the ratio between the marginal productivity value of each input (NPMx1) and the input price (vi) is equal to 1. This condition requires that NMPx be the same as the price of production factor X, or can be written as follows :

$$\mathbf{NPMXi = Pxi\ \frac{NPM_{xi}}{P_{xi}} = 1}$$

$$\mathbf{NPMXi = PY . PMXi}$$

Information:

NPM = Marginal Product Value
Pxi = Input Price
PY = Production
PMXi = Marginal product at input i

The regression coefficient obtained is the same as the elasticity of production (Ep). Elasticity comes from the difference between input divided by output price and PM divided by PR. PM is obtained from bi times Output divided by input. With the following criteria:

$\frac{NPM_{xi}}{P_{xi}}$ = 1 means that the use of production factors is at the optimum point

$\frac{NPM_{xi}}{P_{xi}}$ > 1 means that the use of production factors is not optimal so that the use of production factors needs to be increased/added.

$\frac{NPM_{xi}}{P_{xi}} < 1$ This means that the use of factors of production is no longer optimal so that the use of factors of production needs to be reduced.

RESULT AND DISCUSSION

The area of Telaga District is about 28.16 Km2 and Administratively, Telaga District has 9 villages, and 31 hamlets. The total population of 23,585 people, in general, the composition of the population of Gorontalo regency is dominated by young people, in general, the number of female residents is less than the number of male residents. This can be shown by the sex ratio whose value is more than 100 or for every 100 female population there are 101 male residents, where the male population is 11,809 people, and the female population is 11,776 people with a population growth of 0.33%.

In addition, Telaga District has a tropical climate with an average rainfall of 104 mm and an average rainy day of 13 days in 2019 with the highest rainfall recorded at 190 mm and the number of rainy days as many as 161 days. The average air temperature in Telaga District during the day ranges from 30.9 0C to 33.4 0C with an average air temperature of 26.7 0C - 29.3 0C and the average humidity varies between 51.5% - 93.8%.

Characteristics of Respondents

Characteristics of respondents are internal factors that characterize or identify an individual, usually influencing the individual in making decisions and the independence of the individual. In detail, the characteristics of the respondents analyzed are as follows :

Table 1. Demographic Distribution of Respondents in Telaga District

No.	Characteristics	Category	Number (people)	Percentage (%)
1.	Age range (years)	41-56	44	73,3
		>57	16	26,7
		Total	**60**	**100**
2.	Level of education	Not in school	4	6,7
		primary school	29	48,3
		Junior high school	17	28,3
		Senior High School	10	16,7
		Total	**60**	**100**
3.	Length of farming (years)	7-10	5	8,3
		11-16	22	36,7
		17-23	33	55,0
		Total	**60**	**100**
4.	Number of Family Dependents (person)	1-3	29	48,3
		4-5	28	46,7
		6-7	3	5,0
		Total	**60**	**100**
5.	Land Area (Ha)	0-0,5	22	36,7
		0,56-1,1	24	40,0
		>1,2	14	23,3
		Total	**60**	**100**

Source: Primary data processed, 2021

The profiles of respondents in Table 1 are the results of data collection in the form of questionnaires and questions and answers to find the information needed in this study. The characteristics measured are the selected characteristics and are considered to be able to provide information about the income and production results of lowland rice farmers. The results showed that the respondent's age of 44 or 73.3% was in the medium category (41-56 years), the education level was 29 or 48.3 graduated from elementary school, 33 or 55.0% was in the old category (17-23 years).), 24 or 40.0% of the land area is in the small category (0.56-1.1), and 29 or 48.3% of family dependents are in the (1-3 people) category.

Rice Farming Income Analysis

Economic analysis needs to be carried out in each farming unit that will be carried out, this is important to provide an overview that the farming carried out in Telaga district, Gorontalo regency is profitable or vice versa. The purpose of farming rice or other agricultural commodities is to seek the maximum profit, by keeping production costs as low as possible. Every business certainly has risks, as is the case with rice farming, the risk of crop failure can be reduced or avoided with cultivation technology as recommended as previously discussed.

Table 2. Analysis of Average Rice Farming Income per Hectare in Telaga district, Gorontalo regency

No.	Analysis	Value (Rp) / season	Value (Rp) / Hectare
1.	Reception		
	A. Production (kg)	1.298	1.410
	B. Price (Rp)	5.000	5.434
	Total Revenue (TR) (A×B)	**6.834.081**	**7.428.348**
2.	Production cost		
	A. Variable Cost (VC)		
	1. Local Seeds	499.750	543.206
	2. Fertilizer (Urea))	172.620	187.630
	3. Pesticides (Spontaneous)	77.000	83.695
	4. Labor:		
	a. Tillage	434.064	471.808
	b. Matching	10.476	11.386
	c. planting	356.417	387.409
	d. Fertilization 1	18.810	20.445
	e. Fertilization 2	18.810	20.445
	f. Pest and disease control	14.702	15.980
	g. Harvest	390.833	424.818
	Total Variable Cost (TVC)	1.993.482	2.166.822
	B. Fixed Cost (FC)		
	1. Tool depreciation value:		
	a. Hoe	20.042	21.784
	b. Machete	23.750	25.815
	c. Sprayer	49.357	53.648
	d. Hand Traktor	795.000	864.130
	2. Rent land	95.000	103.260
	3. Land tax	53.950	58.641
	Total Fixed Cost (TFC)	1.037.099	1.127.278
	Total Cost (TC) = (TVC+TFC)	**3.030.581**	**3.294.109**
3.	Revenue (TR-TC)	**3.834.500**	**4.134.239**
4.	RC Ratio (TR/TC)		**2,25**

Source: Primary data processed, 2021

From Table 2, it can be seen, the level of farmer's income, in general, is influenced by several components, namely the amount of production, selling prices, and costs incurred by farmers in their agriculture. The income analysis of the respondent farmers is used to influence the income of the rice farmers by reducing the income with the total cost or expenditure.

In a study conducted in Telaga District, the average production obtained by each farm is smaller than the average farmer production per hectare with a difference of

0.0112%. So that the income obtained by farmers per farm is less than the income of farmers per hectare, which is 59.42%. This can be seen from the different respondent's farmer's land areas, so the income received is also different. The average variable costs incurred by rice farmers in Telaga district, Gorontalo regency with a land area that varies from 0.25 Ha. to 3 Ha.. The variable cost per farm is less than the average farmer production per hectare with 17.33% difference. This is because the hectare costs incurred by farmers for seeds, fertilizers, pesticides, and labor are higher. Fixed costs per farm are smaller than the average farmer production per hectare with a difference of 9.01%. The hectare costs incurred by farmers for the use of the tool, it is divided by the length of use. The use of the tools varies, for the hand tractor itself, the duration of use is up to 8 years, while for the hoe, machete, and sprayer, the duration of use is only up to 9 months.

The income in this study is the income received by the respondent farmers from the difference between the total revenue and the total costs incurred during one planting season. The total income obtained by respondent farmers in Telaga District with the average production obtained by each farm is smaller than the average production of farmers per hectare with a difference of 29.97%. The size of the income is influenced by the amount of production. Respondents who have high production will get a large income and vice versa for the amount of production they want, the income received will be smaller.

Analysis of Revenue to Cost ratio (R/C ratio), which is a comparison of the total amount of revenue with the total amount of production. The results showed that the amount of R/C obtained was 2.25, meaning that R/C ratio > 1, so each purchase was Rp. 1000.00 will get additional revenue of Rp. 2.250/ha.. This shows that the lowland rice farming in Telaga District is economically feasible to cultivate. This is because the land area in the area is quite large but the income is still low. The low income of farmers is influenced by many factors, starting from the level of knowledge of farmers is still low because the average level of education in elementary school graduates (SD) and even some who have never attended education so that farmers do their farming only by relying on experience, not involving modern technology.

The Effect of Production Inputs on Paddy Rice Farming Production

Production factors are production inputs such as land area, labor, seeds, and fertilizers. Processing (management) will affect production. The term production factors are often also called production sacrifice because production factors or inputs are sacrificed to produce products.

Table 3. Regression Coefficient of Effect of Use of Production Inputs on Production of Paddy Rice Farming

Variabel	Regression Coefficient	T_{value}	P_{value}	Information
X1	9.425	5.969	0,001	S
X2	7.248	4.663	0,001	S
X3	0.757	0.515	0.608	NS
X4	2.573	2.321	0.024	S
X5	3.301	5.990	0,001	S
R^2	: 0.80			
Constant (sig.)	: 7,476 (0,027)			
F_{count} (sig)	: 43.192 (0,001)			
F_{table}	: 2,24			
T_{table}	: 1,979			

Source: Primary data processed, 2021

Note: S = significant; NS = not significant; X1 = Land area; X2 = Seeds; X3 = Fertilizer; X4 = Pesticides; X5 = Labor

Based on the results of the analysis of the Regression Coefficient of the Effect of Use of Production Inputs on the Production of Rice Field Farming with (Sig. 0.000). The calculated F-value is 43,192 while the F-table is known to be df1 = 5 and df2 = 54 with a 95% confidence level, so the F-table is 2.24. Therefore, F-count 43,192 > F-table 2.24 or 0.001 < 0.05. From the calculation results in Table 3, it shows there is a simultaneous influence of production factor variables such as land area, seeds, fertilizers, pesticides, and labor on the production of lowland rice farming. An R^2 value of 0.800 which means that it shows that the production of lowland rice farming is influenced by the land area, seeds, fertilizers, pesticides, and labor, which is 80%, while the remaining 20% is influenced by other factors outside the variables studied.

Production Factor Optimization

To determine the level of optimization of the use of production inputs, the Marginal Product Value (NPM) approach is compared to the unit price of production inputs, where the Marginal Product Value (NPM) is the product of the Marginal Product (PM) and the product price per unit. average product per unit) and the unit price of production input is the average price of production input per unit. The level of optimization of the use of production inputs can be achieved if the ratio between the value of the marginal product and the unit price of the production input has a value equal to one. The closer to the value of one, it is said that the use is relatively more optimum and if the value is less than one, it means that it is no longer optimum. The values of y and x are taken based on their averages and the value of product elasticity (bi) is taken from the regression coefficient value in the Cobb Douglas equation which is the value of product elasticity so that the value of bi can be seen directly from the regression coefficient value. Furthermore, by using the above calculation, the marginal product value (NPM) for each production input can be obtained.

Table 4. Marginal Product Value Ratio

Input Production	Average Production	Elasticity (bi)	NPM	PX (Rp)	NMP /PX	Inf.	Optimal Value
Land area	0,92 Ha	9.425	51,222,826	200,000,000	0,25	not optimal	0,23
Seed	33 Kg	7.248	1,098,181	15,000	73,21	not optimal yet	2,41
Urea Fertilizer	96 Kg	0.757	40,885	1,800	22.71	not optimal yet	2,18
Pesticide	1 Liter	2.573	1,286	70,000	0,01	not optimal	0,01
Labor	81,24 HOK	3.301	2,031	50,000	0,04	not optimal	3,24

Source: Primary data processed, 2021

Efficiency is defined as an effort to use the smallest input to get the maximum production. From the Table 4, it can be explained as follows:

1. Land area production input (X1)

The optimization level of land area production input obtained a value of 0.25 <1. This means that the use of land area production inputs is not optimal. So, it is necessary to reduce the production input of land area by 0.23 ha. to achieve the optimal level of land area. to provide maximum profit for rice farmers.

In this study, land use for farming activities is not optimal, because, during the rainy season with water levels that can cause rice plants to be submerged, it is recommended that farmers not carry out rice farming activities because it will cause low production. As stated by Utami and Harianto (2021), and Khodijah (2015), the climatic factors and high humidity will cause a decrease in production, harvest area, and low productivity. Land use for farming activities is not optimal because of the rental price of the land itself. Moreover, farmers in the Telaga sub-district on average are sharecroppers or farmers who only rent land, and also for the area of farmers' land that is rented less than 1 hectare. The area of agricultural land tenure is an important to factor in the production process of farming, and agricultural businesses. In farming, for example, ownership or control of narrow land is often less than optimal than larger land. The narrower the business area, the less optimal farming is done. Unless a farming business is carried out in an orderly manner with good administration and the right technology. The optimal level there was in the application of technology. Because on a narrower land area, the application of technology tends to be excessive (this is closely related to the conversion of land area to hectares), and makes the business inefficient (Daniel, 2004).

2. Seed production input (X2)

The optimization level of Seed production input obtained a value of 73.21 >1. This means that economically the use of seed production inputs is not yet optimal. Therefore, it is necessary to add 2.41 kg. of seed production input to maximize farmer production. To achieve optimal levels of seed used. To provide maximum profit for rice farmers.

The seeds used by farmers at the research site are seeds from the previous cropping season the quality of the seeds is inadequate and the use of seeds is not optimal for lowland rice production. This is in line with the theory of Riefqi *et al.* (2017), which states that the use of quality seeds in cultivation will increase effectiveness and efficiency because the plant population that will grow can be predicted in advance. Thus it can be estimated the number of seeds to be planted and embroidery seeds.

3. Urea fertilizer production input (X3)

The optimization level of urea fertilizer production input obtained a value of 22.71 >1. This means that economically the allocation of inputs for fertilizer production is not optimal. Therefore, it is necessary to add 2.18 kg. of urea fertilizer production input to achieve the optimal level of urea fertilizer use to provide maximum benefits for lowland rice farmers.

According to the results of the study, the use of fertilizers was not optimal due to the average use of fertilizers by farmers as much as 285 kg./ha. the use of fertilizers was not by the dose. According to Riefqi *et al*. (2017), states that the recommended use of urea fertilizer is 200-250 kg./ha. in two fertilizations in one growing season to get maximum results. The use of this type of macro fertilizer. This is because farmers in the research location generally still have the perception that the more production inputs are given, the higher the products produced. When in fact plants absorb nutrients (fertilizer) according to their needs, excessive application will hurt the environment and increase production costs incurred.

4. Pesticide production input (X4)

Pesticide production input optimization level obtained a value of 0.01 <1. This means that economically the allocation of pesticide production inputs is not optimal. Therefore it is necessary to reduce pesticides by 0.01 liters to achieve optimal levels of pesticide use to provide maximum benefits for lowland rice farmers.

The use of pesticides that have not been optimal is due to the excessive use of pesticides by farmers in the research location. This is in line with the research of Neonbota and Kune (2016) which states that the use of pesticides that are not by farming guidelines such as in measuring doses and doses can cause the farming to be not optimal. Pesticides are chemical substances used to kill or control various pests. In the use of pesticides must pay attention to the dose and size. Pesticides are essentially poisons if they are used too much will be harmful. Farmers in Indonesia use pesticides to help with intensification programs to overcome the problem of pests and diseases that attack. Pesticides can quickly reduce the population of pests that attack plants so that the decline in agricultural yields can be reduced (Yuantari *et al*., 2013)

5. Labor production input (X5)

The optimization level of labor production input is 0.04 <1. This shows economically that the use of labor is not optimal. Therefore, it is necessary to reduce the production input of labor by 3.24 HOK To achieve the optimal level of use of labor to provide maximum profit.

The non-optimal use of labor at the research site is caused by many farming activities carried out with a piece-work system to the number is excessive and there are still many unproductive workers to the work carried out tends to be ineffective and not optimal. This is in line with the research of Muhyidin (2010), in which the labor variable is not optimal due to many unproductive workers.

Overall, the average workforce both outside the family and within the family devoted to rice farming for farmers per planting season in Telaga District is 81.24 HOK. Meanwhile, according to Zahasfana *et al*. (2017), the outpouring of good labor from inside and outside the family which should be used in rice farming per hectare and per growing season is 78.15 HOK.

CONCLUSION

The average income of lowland rice farmers for one planting season in Telaga district, Gorontalo regency is Rp. 37,217,960 ha./MT.. The analysis show that the Revenue of Cost Ratio for lowland rice farming is 2.14. Thus, lowland rice farming is feasible to cultivate, Land Area (X1), Seed (X2), Fertilizers (X3), Labor (X4), and Pesticides (X5) simultaneously have a significant effect on income, and only the fertilizer variable (X3) has no significant effect on the income of lowland rice farming in Gorontalo regency. The use of production factors in the form of land area, pesticides, and labor is not optimal because the optimization value is NMPxi < 1, which means its use needs to be reduced. The use of production factors in the form of seeds and urea fertilizer is not optimal because the optimization value is NMPxi > 1, which means that its use needs to be increased/added to provide maximum benefits for lowland rice farmers. It is hoped that the government will provide material and non-material assistance in the form of training or counseling. Efforts are needed to empower the farmer groups and agricultural extension workers, to support production optimization and solve problems so that farmers will get better incomes than before.

It is hoped that farmers will adjust the use of production factors, namely land, seeds, fertilizers, pesticides, and labor. Regarding standards, and farmers can maintain and increase production yields from lowland rice farming. For the optimization level of the use of production inputs that have not been or are not appropriate, it is necessary to add and subtract so that their use is efficient and can increase farmers' income. The results of this study are expected to be used as comparison materials and research references, and as comparison materials to further deepen further research.

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