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Farmers' Perceptions of the Implementation of Organic Rice Development in Bantaeng Regency

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Abstract

This research aims to analyze farmers' perceptions of the implementation of organic rice development, identify factors that influence farmers' perceptions of the implementation of organic rice development in Bantaeng Regency, and analyze factors that influence farmers' perceptions of the implementation of organic rice farming in Bantaeng Regency. This research starts from October to November 2024 using quantitative methods. The data collection method uses the library or literature study method, observation, questionnaires and in-depth documentation using a questionnaire that has been tested for validity and reliability, while the data analysis method uses a Likert scale and multiple linear regression. The results of the analysis using multiple linear regression tests show that the level of farmers' perception of the implementation of organic rice development in Bantaeng Regency is relatively high, with an aggregate average of 69.60%. Meanwhile, the factors that influence farmers' perceptions of the implementation of organic rice development in Bantaeng Regency are innovation characteristics.

Keywords:Perception, Farmers, Organic Rice.

INTRODUCTION

Organic rice farming has become a trend in Indonesia in recent years, along with increasing public awareness of the importance of healthy and environmentally friendly food products. Organic farming systems avoid the use of synthetic chemical fertilizers

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and chemical pesticides, instead relying on natural ingredients and sustainable agricultural practices, such as organic fertilization, integrated pest control, and crop rotation Andoko, (2015).

In Indonesia, the government has launched an organic rice farming development program since 2001 through the Regulation of the Minister of Agriculture Number 64/Permentan/OT.140/10/2006 concerning the Development of Organic Agriculture. This program aims to improve the welfare of farmers, preserve the environment, and provide healthy food products for consumers (Ministry of Agriculture, 2006). However, the adoption of organic rice farming in Indonesia is still not optimal, with organic rice land area only reaching around 0.17% of the total national rice land area in 2020 (Central Statistics Agency, 2021). In addition, the Organic Rice/Rice SPO in Indonesia refers to the best operational methods that can be carried out by organic rice/rice production actors in accordance with SNI 01-6729-2010 Organic Food System (Wasito, 2016).

South Sulawesi is the largest food crop producing area in the Eastern Region of Indonesia. The title as a national rice barn strengthens South Sulawesi's position as a potential producer of food crops. In addition to rice as a mainstay food crop commodity, other food crops produced in South Sulawesi are corn, cassava, sweet potato and cassava. Bantaeng is one of the districts in the area as an agricultural producer, especially in terms of rice production. The area of rice fields in several districts in South Sulawesi province can be seen in the following table:

Table 1. Land area and rice production in South Sulawesi Province by district/city in 2022 - 2023.

Regency/City	Harvest Area (Ha)		Production(Tons)		Development relative	
	2022	2023	2022	2023	Absolute	(%)
Selayar Islands	1.588	1.579	6.711	6.426	-285	-4,24
Bulukumba	42.400	42.683	208.838	215.958	7.120	3,41
Bantaeng	10.468	9.642	56.206	47.147	-9.059	-16,12
Jeneponto	27.387	25.283	127.923	112.692	-15.231	-11,91
Takalar	27.147	27.726	112.390	126.551	14.161	12,62
Gowa	50.069	48.550	231.035	231.656	621	0,27
Sinjai	22.680	22.492	103.064	108.420	5.356	5,20

Source: Central Statistics Agency of South Sulawesi Province, 2024

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In Table 1, it can be seen that Bantaeng Regency with a level of development of rice production in 2023 has a declining rate of rice production development compared to 2022, which is -16.12%. The rate of decline is the highest compared to several districts/cities around the district. Bantaeng Regency with an area of about 395.83 km², Bantaeng has a diverse topography, ranging from lowlands to mountains, which allows various types of plants to grow (BPS Bantaeng Regency, 2022). The agricultural sector is the backbone of the region's economy, with a contribution of 30% to the Bantaeng Regency Gross Regional Domestic Product (GDP) (Bantaeng Regency Agriculture Office, 2023).

In recent years, there has been a paradigm shift in agricultural practices in Bantaeng Regency. Conventional agriculture that relies on chemical inputs is starting to be challenged along with increasing awareness of the negative impact of excessive chemical use on the environment and health Fitria (2024). Alternatively, natural agriculture began to be introduced and promoted among local farmers.

Natural agriculture, also known as organic farming or agroecology, is an agricultural production system that relies on ecological processes, biodiversity, and cycles adapted to local conditions, without using inputs that have adverse effects (IFOAM, 2020). This method emphasizes the use of natural ingredients, crop rotation, biological pest control, and other environmentally friendly practices. The introduction of natural agriculture in Bantaeng Regency is inseparable from the initiative of the local government and non-governmental organizations (NGOs), namely the Butta Toa Natural Farmers Union (SPA Butta Toa) which focuses on sustainable agriculture. Training programs and demonstrations of natural agricultural plots have been carried out in various sub-districts since 2018 (Bantaeng Regency Agriculture Office, 2023). However, the transition from conventional farming to natural farming is not an easy and quick process. Farmers' responses to this innovation varied, ranging from very enthusiastic to skeptical and rejected.

The implementation of organic rice farming in Bantaeng Regency still faces various challenges, one of which is the response of farmers to this system. Farmers have an important role in the successful implementation of organic farming because they are the main actors in cultivation activities. Therefore, understanding farmers' perceptions of the implementation of organic rice farming is important to identify the factors that encourage or hinder the adoption of this system. Farmers generally argue that organic farming systems can improve the condition of land that has been degraded by using organic matter as a means of production. They also believe that organic farming is an

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environmentally friendly alternative to reduce dependence on synthetic means of production Roswita and Riza, (2019).

Understanding farmers' perceptions of the implementation of organic rice farming in Bantaeng Regency is important to determine the right strategies and policies in encouraging the development of organic agriculture in the area. The results of the research of Juliantika., (2020) show that the performance of organic and inorganic rice farming is land cultivation, nurseries, planting, pest and disease control, fertilization, irrigation, and harvesting. By identifying the factors that influence farmers' perceptions, governments and other relevant parties can design appropriate programs and interventions to increase farmers' interest in and participation in implementing organic farming systems.

In addition, this research can also provide valuable information for parties interested in developing organic rice farming in Bantaeng Regency, such as research institutions, universities, and non-governmental organizations. The information can be used as a basis for designing effective strategies and programs to support the adoption of organic farming among farmers. For example, by designing training and extension programs tailored to the needs and challenges faced by farmers, or by developing incentive and marketing schemes that are more profitable for organic farmers. Efforts to increase the success of the organic rice sector are certainly inseparable from farmers' perception of the organic rice system.

Bantaeng Regency is one of the rice production centers in South Sulawesi Province. This study aims to analyze the factors that affect farmers' perception of the implementation of organic rice development in Bantaeng Regency.

RESEARCH METHODS

This research was conducted in Pajukukang District, Bantaeng Regency. This research was conducted from October to November 2024. In this study, the total population is 525 farmers, so the number of samples determined in the study is 41 organic rice farmers, using the purposive sampling method. The data source is primary data, taken through direct interviews using questionnaires.

To test the factors that affect farmers' perception of the implementation of organic rice development in Bantaeng district, the tool used is multiple linear regression. With the following formula:

$$Y = a + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \beta5X5 + \beta6X6 + \beta7X7 + \beta8X8 + \beta9X9$$

Information:

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Y = Perception Variable
α = Constant
β1 = Regression Coefficient
X1 = Age variable
X2 = Experience Variable
X3 = Experience Variable
X4 = Income Variable
X5 = Land Area Variable
X6 = Information Access Variable
X7 = Extension Role Variable
X8 = Group Role Variable
X9 = Innovation Characteristic Variable

To test the effect hypothesis together, the F Test and the Stimulant Test were used with the following formulation Sugioyo (2011):

$$Fcount = \frac{R2/k}{(1-R2)(n-k-1)}$$

Information:
R = Coefficient of determination
k = Number of independent variables n
= Number of members of the sample
Hypothesis formulation tested :

1. H0 : bi = 0 This means that there is no significant influence between the variable X (independent) as a whole and the variable Y (dependent).
2. H0 : bi ≠ 0 This means that there is a significant influence between the variable X (independent) as a whole and the variable Y (dependent). The testing criteria are as follows:

1. If Fcalculate > FTabel : then H0 is rejected which means that the independent variable (X) as a whole has a significant influence on the dependent variable (Y).
2. If Fcalculate < FTabel : then H0 is accepted which means that the independent variable (X) simultaneously has no significant influence on the dependent variable (Y).

To test the influence of the independent variable (X) individually/partially on the dependent (Y), the t-test is used with the formula:

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$$Thcount = \frac{bi}{se\ bi}$$

Information:

Bi = 1st regression coefficient, with the free degree n-k-l

Se(bi) = Root variance (bi)

Hypotheses tested:

1. H0 : bi = 0 : This means that the independent variable (X) has no real effect on the implementation of organic rice development in Bantaeng Regency.
2. H0 : bi ≠ 0 : This means that it has a real effect on the implementation of organic rice development in Bantaeng Regency.

The testing criteria are:

1. If the calculation > tTable: then H0 is minus, which means that the independent variable (X) as a whole has a significant influence on the dependent variable (Y).
2. If the calculation < tTable: then H0 is accepted which means that the independent variable (X) simultaneously has no significant influence on the dependent variable (Y).

RESULTS AND DISCUSSION

Analysis of farmers' perceptions of the implementation of organic rice development in Bantaeng Regency

Perception in this study consists of three categories, namely, economic perception, technical perception and social perception. The following is presented the results of the analysis of farmers' perceptions of the implementation of organic rice development in Bantaeng Regency as follows:

Table 2. Distribution of Respondents Based on Farmers' Perceptions

Perception Criteria	Score obtained	Maximum Score	Percentage	Average	Category
Economic Perception	281	410	68,54	3,43	Tall
Technical Perception	291	410	70,98	3,55	Tall
Social Perception	284	410	69,27	3,46	Tall
Sum	856	1230			

Source : Primary Data Analysis, 2025

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Based on Table 2 above, it can be seen that the analysis of the level of farmers' perception is explained as follows:

Perception Economically

The economic perception reflects farmers' views on the extent to which organic rice development is able to provide financial benefits. Based on the results of the analysis, a score of 281 was obtained out of a total maximum score of 410, with a percentage of 68.54% and an average score of 3.43 which is classified as high. When depicted with the following continuum line:

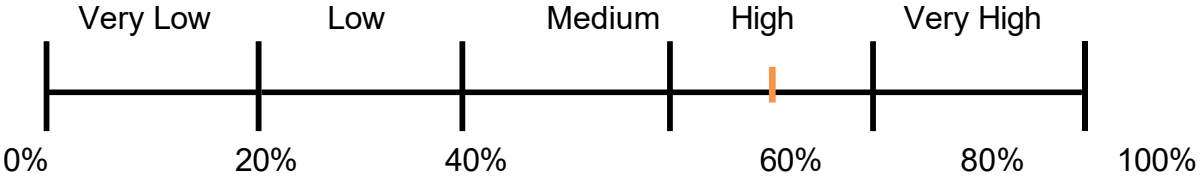


Figure 1. A continuum line of perception levels economically

Based on figure 1, it can be seen that the level of economic perception of the respondents is not yet at a very high level, these results show that most farmers are starting to feel the economic benefits of organic farming practices, although there are still doubts especially in terms of sustainable income and high initial input costs.

Technical Perception

Technical perception refers to farmers' assessment of their operational feasibility and technical ability in managing an organic rice farming system. The results of the calculation showed that technical perception obtained a score of 291 out of a maximum score of 410, with a percentage of 70.98% and an average of 3.55 which was included in the high category. When depicted with the following continuum line:

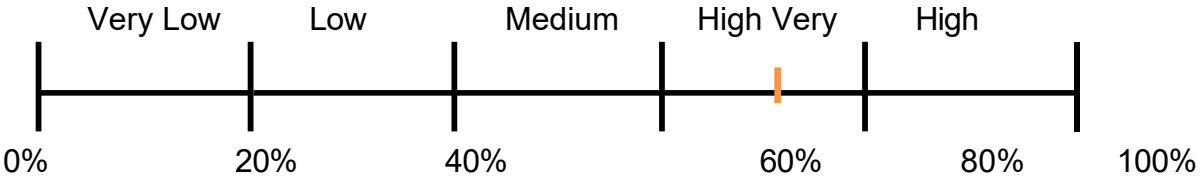


Figure 2. Continuum Line Levels of Perception Technically

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Based on figure 2, it can be seen that the level of perception of the respondents is technically in the high category. This indicates that farmers in Bantaeng Regency have good enough confidence and technical readiness in implementing organic farming practices. This assessment is supported by the view that organic systems not only maintain environmental sustainability but also produce healthier and safer products because they are free of synthetic chemicals.

Social Perception

Social perception describes the extent to which farmers respond to the social influences of their environment in adopting organic farming systems, such as perceptions of peer support, community acceptance, and evolving social norms. The results of the analysis showed a score of 284 out of a maximum score of 410, with a percentage of 69.27% and an average score of 3.46, which is also classified as high. When depicted with the following continuum line:

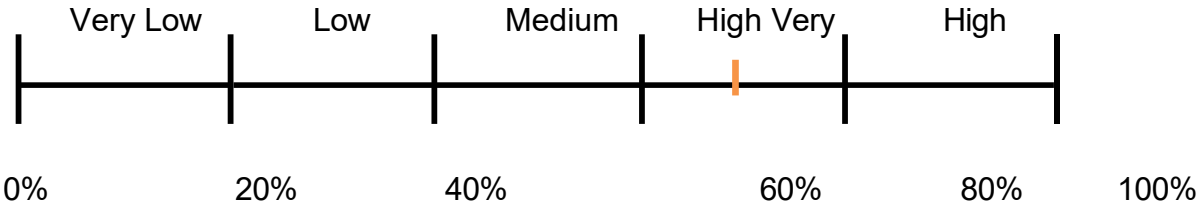


Figure 3. Continuum Line of Perception Level

Based on figure 3, it can be seen that the level of social perception of the respondents is in the high category. This shows that socially, farmers are beginning to feel acceptance and support from the surrounding environment for organic farming systems, even though they are not evenly distributed overall. This significant social influence factor is one of the important indicators in encouraging organic farming more broadly.

This is reinforced by Nasution's (2020) research which explains that social support and interaction between farmers contribute positively to increasing the motivation and success of farmers in adopting sustainable farming systems.

Based on the results of the analysis of the three dimensions of perception, namely economic, technical, and social perceptions, it can be concluded that overall the level of farmers' perception of the implementation of organic rice development in Bantaeng Regency is relatively high, with an aggregate average of 69.60%. These findings indicate that farmers have shown a relatively positive attitude towards the implementation of organic farming systems, especially from a technical point of view. Although the economic

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and social aspects are still in the sufficient category, both show an increasing tendency along with the increase in information, education, and hands- on practical experience in the field. Therefore, an approach that focuses on strengthening the technical capacity of farmers and socio-economic institutional support is expected to accelerate the process of sustainable adoption of organic agriculture in this area

Analysis of factors that affect farmers' perception of the implementation of organic rice development in Bantaeng Regency

The analysis of factors that affect farmers' perception of the implementation of organic rice development in Bantaeng district in this study includes age, education, experience, income, land area, access to information, the role of extension workers, the role of groups, and innovation characteristics.

Coefficient of Determination

To find out what factors affect farmers' perceptions, they must first know the value of the determination coefficient which explains the percentage of variable X is able to explain variable Y with the value of Adjusted R Square, because the independent variable in this study is more than two variables (Priyanto, 2012).

Table 3. Output Model Summary Results

Type	R	R Square	Adjusted R Square	Std. Error of the Estimate	PRESS	Durbin-Watson
1	.702a	.493	.346	1.537	123.002	1.769

Source: Primary Data Analysis, 2025

Based on Table 3, it can be seen that the R value in multiple linear regression shows a multiple correlation value between all independent variables (age, education, experience, income, land area, access to information, role of extension workers, group roles, and innovation characteristics) and the bound variable (farmer perception). The R value ranges from 0 to 1, if it is close to 1 then the relationship is closer, but if it is close to 0 then the relationship is weaker (Priyanto, 2012). The SPSS Output result shows that the correlation value (R) is 0.702, meaning that the multiple correlation value is very strong because the value is close to 1. Thus, it can be concluded that there is a very strong relationship between all independent variables (age, education, experience, income,

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land area, access to information, the role ofextension workers, group roles, and innovation characteristics) and the bound variables (farmer perception).

R *Square* (R2) or the square of R, which indicates the coefficient of determination. This number will be changed in the form of a percentage, which means the percentage of the contribution of the influence of the independent variable on the dependent variable. The R^2 value of 0.493 means that the percentage of contribution influenced by the variables of age, education, experience, income, land area, access to information, the role of extension workers, the role of groups, and the characteristics of innovation on farmers' perception is 49.3%, while the rest is influenced by other variables that are not included in this model.

Adjusted R Square is a pre-adjusted *R Square*, the value is 0.346. This value also shows the contribution of the influence of independent variables on dependent variables. *Adjusted R Square* is usually used to measure the contribution of influence if in regression more than two independent variables. *The Standard Error of the Estimate*, is a measure of prediction error, the value is 1.537. This means that errors that can occur in predicting farmers' perceptions are 1,537.

Regression Coefficient Test Together (F Test)

The F test or regression coefficient together is used to find out whether together independent variables have a significant effect on the dependent variables. To find out whether independent variables (age, education, experience, income, land area, access to information, role of extension workers, group roles, and innovation characteristics) together affect dependent variables (farmer perception).

The following are presented the results of the regression coefficient test together (F Test) in Table 4.

Table 4. Regression Coefficient Test NEW ERA

Type	Sum of Squares	Df	Mean Square	F	Sig.
Regression	71.174	9	7.908	3.348	.006b
Residual	73.216	31	2.362		
Total	144.390	40			

Source : Primary Data Analysis, 2025

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Based on Table 4, it is possible to test the hypothesis presented in this assessment that it is suspected that age, education, experience, income, land area, access to information, the role of extension workers, group roles, and the characteristics of innovation together. It is known that the value of Fis calculated (3.348) and FTable at α = 0.05 (2.30), then the hypothesis test is Fcalculated > FTable (3.348 > 2.30) then H0 is rejected and the significance of 0.000 < 0.05 means that H0 is rejected, meaning that age, education, experience, income, land area, access to information, the role of extension workers, group roles, and the characteristics of innovation together affect perception. farmers to the implementation of organic rice development in Bantaeng Regency. For the value of Fthe Table can be seen in Appendix 3, with a significance level of 0.05.

Partial Regression Coefficient Test (T Test)

The T test or partial coefficient test is used to find out whether or not the independent variable has a significant effect on the dependent variable. In this study, it is to find out whether or not independent variables (age, education, experience, income, land area, access to information, role of extension workers, group roles, and innovation characteristics) have a significant effect on dependent variables (farmer perception). T Table is searched at a significant 0.05/2= 0.025 (2- sided test) with a degree of freedom df 1 (number of variables -1) = 9 and df 2 (n-k- 1) or 41-9-1=31. The result obtained for T Table is -2,040/2,040. Partial regression coefficient test (T test) in Table 5.

Table 5. Partial Regression Coefficient Test (T Test) Coefficient

Variable	B	Std. Error	Beta	T	Sig.
(Constant)	13.196	7.772		1.698	.100
Age	-.354	.326	-.164	-1.087	.285
Education	.344	.347	.134	.992	.329
Experience	.187	.330	.077	.566	.576
Income	.286	.285	.148	1.005	.323
Luas_lahan	-.304	.257	-.175	-1.182	.246
Akses_informasi	.235	.595	.054	.395	.695
Peran_penyuluh	.093	.269	.045	.345	.732
Peran_kelompok	-.540	.305	-.248	1.773	.086

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Karakteristik_inovasi	1.115	.345	.495	3.227	.003

Source: Primary Data Analysis, 2025

Based on Table 5, it can be known that the coefficient B is the value of the constant Y (if the value of the variable X = 1) because the lowest value in the data measurement is 1 and the values of the regression coefficient of the variable X which indicate the increase or decrease of the variable Y based on the variable X and these values are included in the multiple linear regression equation (Priyanto, 2012), the equation is:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \beta 7X7 + \beta 8X8 + \beta 9X9$$

$$Y = 13.196 - 0.354\ X1 + 0.344\ X2 + 0.187\ X3 + 0.286\ X4 - 0.304\ X5 + 0.235\ X6 + 0.093\ X7 - 0.540\ X8 + 1.115\ X9$$

The results of the equation can be explained in detail as follows:

1) The value of the constant (α) is 13,196. This means that if age (X1), education (X2), experience (X3), income (X4), land area (X5), access to information (X6), role of extension workers (X7), group role (X8), and innovation characteristics (X9) are 0, then the value of farmer perception (Y) is positive, which is 13,196.
2) The value of the regression coefficient of the age variable (X1) is negative, which is -0.354. This means that if the age increases by 1 point, then the farmer's perception will decrease by 0.354 assuming other independent variables have a fixed value. The negative value coefficient means that there is a negative relationship between age and farmers' perceptions, the older the farmer's perception of the implementation of organic rice development.
3) The value of the regression coefficient of the educational variable (X2) is negative, which is 0.344. This means that if education increases by 1 point, then farmers'
4) ive, which is 0.187. This means that if the experience increases by 1 point, then the farmer's perception will also increase by 0.187 assuming other independent variables are still valued. The positive value coefficient means that there is a positive relationship between experience and farmer perception, the higher the experience, the higher the farmer's perception of the implementation of organic rice development.
5) The value of the regression coefficient of the income variable (X4) has a positive value, which is 0.286. This means that if income increases by 1 point, then farmers' perception will increase by 0.286 assuming other independent variables have a fixed

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value. The positive value coefficient means that there is a positive relationship between income and farmer perception, the higher the income, the higher the farmer's perception of the implementation of organic rice development.

6) The value of the regression coefficient of the land area variable (X5) has a negative value, which is -0.304. This means that if the land area increases by 1 point, then the perception of farmers will decrease by 0.304 assuming other independent variables have fixed values. The negative value coefficient means that there is a negative relationship between the land area and the perception of farmers, the more land area, the lower the farmers' perception of the implementation of organic rice development.
7) The value of the regression coefficient of the information access variable (X6) is positive, which is 0.235. This means that if access to information increases by 1 point, then farmers' perception will increase by 0.235 assuming other independent variables have a fixed value. The positive value coefficient means that there is a positive relationship between access to information and farmers' perception, the
8) r the role of extension workers, the higher the farmers' perception of the implementation of organic rice development.
9) The value of the regression coefficient of the group role variable (X8) is negative, which is - 0.540. This means that if the role of the group increases by 1 point, then the perception of farmers will decrease by 0.540 assuming that other independent variables have a fixed value. The negative value coefficient means that there is a negative relationship between the role of the group and the perception of farmers, the lower the role of the group, the lower the perception of farmers towards the implementation of organic rice development.
10) The value of the regression coefficient of the innovation characteristic variable (X9) has a positive value, which is 1.115. This means that if the characteristics of innovation increase by 1 point, then the perception of farmers will increase by 1.115 assuming other independent variables have a fixed value. The positive value coefficient means that there is a positive relationship between the characteristics of innovation and the perception of farmers, the higher the characteristics of innovation, the higher the perception of farmers towards the implementation of organic rice development.

The influence of each variable on farmers' perception of the implementation of organic rice development can be found by comparing the calculated T value obtained

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with the T value of the Table at a certain level of error and can also be seen by comparing the significant level. If the value of -Tis calculated < -TTable or the value of Tis calculated > TTable and the significance is < 0.05, then H0 is rejected, meaning that there is a real influence partially between variable X onalysis of nine independent factors was carried out using linear regression. The results of the analysis show that only one variable, namely the characteristics of innovation, has a significant positive effect on farmers' perceptions. This means that farmers' positive perceptions are largely influenced by the extent to which they judge that organic farming innovations are easy to implement, fit local conditions, and provide long-term benefits. Other factors such as age, education, experience, and income do not provide statistically significant influences, although they cannot be completely ignored in the context of policy implementation.

Partially, eight of the nine variables had no significant effect on farmers' perceptions. However, simultaneously, all variables together affected farmers' perceptions with a significance value of 0.006 (smaller than 0.05), which suggests that the overall model has a fairly good explainability. The Adjusted R Square value of 0.346 shows that 34.6% of the variation in farmers' perceptions can be explained by these nine factors. The role of farmer groups even shows almost significant negative influences, indicating the existence of potential internal obstacles within the group that need to be addressed. Meanwhile, access to information and the role of extension workers are still weak also show that knowledge dissemination channels are not optimal in shaping farmers' perceptions evenly and deeply.

These findings are reinforced by several previous studies that state that the characteristics of innovation are a key factor in the adoption of agricultural technology. Rogers (2003) in his theory of innovation diffusion emphasizes that perceptions of relative advantage, compatibility, complexity, and ease of testing greatly influence the acceptance of innovation.

CONCLUSION

Based on the results of the analysis and discussion that has been described, the conclusions on farmers' perceptions of the implementation of organic rice farming in Bantaeng Regency are as follows:

1. The level of farmers' perception, namely economic perception, technical perception, and perception of the implementation of organic rice farming in Bantaeng district is classified as social in the High category (69.76%). This means that farmers are starting to be confident in the implementation of organic rice farming.

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2. Factors that affect farmers' perception of the implementation of organic rice farming
   a. Internal factors such as age, education, land area, income, experience, and access to information do not affect the implementation of organic rice farming.
   b. External factors are the characteristics of innovation, while the role of groups and the role of extension workers do not affect the implementation of organic rice farming.

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