

Factors Influencing the Application of Agricultural Technology in Veteran Jaya Village, Martapura District, Ogan Komering Ulu Timur Regency

Yunita¹, Rini Efrianti², Yunita Sari³, Novayanti⁴
^{1,2,3,4}University of Baturaja, South Sumatera, Indonesia

Author Corresponding Email: yunitaazh28@gmail.com

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Abstract

This study explains the problems in terms of the factors that influence the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency. This study emphasizes the role of farmer groups in the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency, especially in rain-fed rice farming. The purpose of this study was to describe the factors that influence the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency. The type of research used in this study is the quantitative descriptive method (Valeriana et al., 2020). The data obtained from the study population sample were analyzed according to the statistical method used and then interpreted. Based on the results of the analysis, it can be concluded that the factors (X1) age of farmers, (X2) length of education, (X3) land area, (X4) have a significant effect on farmers' decisions to apply agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency. The most influential factor in the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency is the experience of farming rice fields with a standard value of the partial regression coefficient of 6.049.

Keywords: Agricultural Technology, Veteran Jaya Village, Rice Farming, Farmer Age Factor, Land Area, Farming Experience, Application of Technology.

Introduction

The majority of Indonesia's population works and depends on the agricultural sector, because the agricultural sector has a positive and significant effect on economic growth (Lasaksi, P. 2023). Therefore, development in the agricultural sector really needs to be encouraged by both the government and the private sector by utilizing all available resources. The development of the agricultural sector is expected to be a driving force for the development of other sectors, including economic development. Thus, the agricultural sector has great potential to increase people's income, especially farmers. In an effort to make the agricultural sector capable of facing all changes and challenges of the development of the times, it is necessary to improve agriculture in various aspects. Farmers as one of the human resources of agriculture, have so far been considered to still have various limitations that lead to low quality of life. While at the same time, farming communities face many problems related to increasing needs as a result of the logical consequences of advances in science and technology. As a result, farming in Indonesia is still dominated by small-scale family farming businesses that are very weak in various fields (Nippi & Pananrangi, 2019).

Soekartawi (2016) stated that one of the factors causing increased production is the improvement of technology from the use of old technology to new technology, either in the form of production tools, consumption tools, or production inputs or consumer goods. The existence of

new technology can be profitable and reduce production costs if balanced with increased productivity. Technology can be expressed by the production function, so technological change can be described by changes in the production function. The role of technology changes the production function upward due to the use of new technology (upward shift of production).

Farmer groups play an important role in the implementation of agricultural technology. Farmer group institutions will play a major role in encouraging their members to actively implement good farming practices, so that they can increase production. Various agricultural technologies such as: planting time management, crop and variety rotation, water management, control of plant pests (OPT), soil and water conservation, and so on are only effective if carried out together by members of the farmer group. Because, if it is only done by farmers individually, without consolidation with other farmers, it will not provide the expected results (Nuryanti & Dewa, 2021).

This research is motivated by a research gap in previous studies. Based on research conducted by (Nuryanti & Dewa, 2021) stated that the role of farmer groups is not only as a medium for distributing government assistance, but also as an agent for implementing new technology. Then research conducted by (Apriani et al., 2019) stated that the implementation of technology application activities received a good response from farmer group members in particular, and the community in general because it was proven to increase rice productivity and farmer income so that farmer welfare increased. Then the results of research conducted by (Siregar, 2020) stated that the latest agricultural technology has developed fertilizers that are adjusted to plant needs rice and more effective and environmentally friendly pesticides. By applying the right dosage and application time, it can improve the quality and quantity of rice harvests. Finally, the application of the latest agricultural technology also includes the use of modern agricultural tools and machines. Efficient agricultural tools and machines, such as soil processing machines, planting machines, and harvesting machines, can speed up the production process, reduce labor, and improve operational efficiency.

The difference between this study and the previous one is that this study emphasizes the role of farmer groups in the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency, especially in rain-fed rice farming. Thus, the title of this study is, the role of farmer groups in the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency.

Literature Review

In addition to the theories discussed above, a review of the results of previous research is also carried out. Reviewing previous results will help examine what is discussed with various specific approaches, in addition to providing an overview of the position of the researcher with previous researchers.

Previous research will be described in the table below:

Table 1. Previous Research

No	Author	Research Title	Analysis Tols	Analysis Results
1.	Apriani et al., 2018	Level of Implementation of Integrated Crop Management Technology (Ptt) on Technical Efficiency of Rice	Linear Regression Using SPSS	The level of application of PTT rice technology in Bogor Regency is classified as moderate, where the

		Farming Business Multiple.		<p>technology component with the highest level of application is row planting distance. legowo 2:1 namely by 98.50 percent. Meanwhile, the technology component with the lowest level of application is the use of organic fertilizer or manure, only 27.00 percent. Factors influencing the level of application of PTT rice technology in Bogor Regency are non-farm income, the intensity or number of SLPTT and non-SLPTT training attended by farmers, and the employment status of farmers. The variable level of application of PTT technology affects technical efficiency, the variable is followed by farmer access to business credit and land ownership status. As for The average level of technical efficiency of rice farming in Bogor Regency is 67.40 percent or not yet efficient.</p>
2.	(Ismilaili et al., 2018)	Level of Adoption of Integrated Crop Management (PTT) Rice Paddy Innovations in Leuwiliang District, Bogor Regency	Simple linear regression analysis using SPSS	<p>The results of the study show that (1) The level of adoption of the Integrated Crop Management (PTT) innovation for rice fields in Leuwiliang District, Bogor Regency is in the high category (2) Farmers' perceptions</p>

				of the components of the PTT innovation technology for rice are in the Very High category and (3) Factors of farming experience, land ownership, availability of PTT technology information, knowledge and farmers' perceptions of PTT innovation have a significant effect on the level of adoption of age.
3.	Lasaksi, P. (2023)	Analysis of the Role of the Agricultural Sector in the Economy	Simple linear regression analysis using SPSS	The results obtained from this study and analysis are that the existence of the agricultural sector in economic development is still considered a passive sector and is merely a supporting element as an input for other sectors, especially the industrial sector and trade and services. However, this can also be an opportunity and challenge for the agricultural sector to grow rapidly and improve its competitiveness. Although the agricultural sector in a region is not a leading sector, it does not mean that the agricultural sector can be ruled out because of its important role in the process of economic growth and is closely related to food security, labor absorption, sources of industrial raw

				materials, and sources of community income which then have an impact on the economic growth of a region. So it can be concluded that: The effect of the agricultural sector on economic growth is positive and significant.
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Research Method

The type of research used in this study is a quantitative descriptive method (Valeriana et al., 2020). Data obtained from the research population sample were analyzed according to the statistical method used and then interpreted. This research will be conducted in Veteran Jaya Village, Martapura District, East Ogan Komering Ulu Regency, South Sumatra. The determination of the research location was carried out intentionally (purposive sampling) considering that Martapura District, East Ogan Komering Ulu Regency is one of the Districts with the largest number of Gapoktan. This research will be conducted in August 2024.

The sampling method used in this study is the proponent stratified random sampling method with a population of 88 farmer households.

Results and Discussion

A. General Description of Research Object

Location and Boundaries of the Research Area.

In general, the topographic conditions of Veteran Jaya Village, Martapura District, East OKU Regency include plains to undulating $\pm 63\%$, undulating to gravelly $\pm 29\%$ and hilly to undulating $\pm 8\%$. The boundaries of Veteran Jaya Village, Martapura District, East OKU Regency are:

- a. North of Banumas Village.
- b. South side of Sungai Tuha Jaya Village
- c. West of Pulau Negara Village
- d. East side of Bukit Sari Village

Population situation

In 2024, the population of Veteran Jaya Village, Martapura District, East OKU Regency will be 18,591 people, with a composition of 10,092 male people and 8,499 female people. Thus, the population of Veteran Jaya Village Veteran Jaya, Martapura District, East OKU Regency, has more males than females.

Table 1. Population by Age in Veteran Jaya Village, Martapura District, East OKU Regency in 2024

NO	GROUP		WNI		WNA			TOTAL WNI + WNA		
	AGE	LK	PR	JUMLA H	L K	P R	AMOUN T	LK	PR	T

1	0 - 9	901	841	1,742	-	-	-	901	841	1,742
2	10 - 24	730	791	1,521	-	-	-	730	791	1,521
3	25 - 39	944	498	1,442	-	-	-	944	498	1,442
4	40 - 49	880	787	1,667	-	-	-	880	787	1,667
5	50 - 59	786	685	1,471	-	-	-	786	685	1,471
6	60 - >	114	167	281	-	-	-	114	167	281
JUMLAH		4,355	3,769	8,124	0	0	0	4,355	3,769	8,124

Source: BPS Veteran Jaya Village, Martapura District, East OKU Regency, 2024

Table 4.1 shows that the majority of the population of Veteran Jaya Village, Martapura District, East OKU Regency is aged between 0-9 years, namely 1,742 people.

Population Status Based on Education

The community of Veteran Jaya Village, Martapura District, East OKU Regency has a relatively advanced level of education. This can be seen from the large number of people there who have achieved compulsory education starting from elementary school, junior high school, and high school, but there are still some who have not graduated from elementary school. Some of the people of Veteran Jaya Village, Martapura District, East OKU Regency have also continued their education to DI, DI, DIII, S1 and S2.

B. Farmer Identity Example

Income from paddy farming

Table 2. Income from Paddy Farming Business

Revanue/Season (Million)	Income	
	Farmer	%
5-10	12	34.29
11-20	23	65.71
Jumlah	35	100

Source: primary data (2024)

Income is the result received by rice farmers after deducting production costs. Most of the income of rice farmers in Veteran Jaya Village, Martapura District, East Ogan Komerung Ulu Regency per planting season is 11 to 20 million.

2. Example Farmer Training

The training attended by the sample farmers in Veteran Jaya Village, Martapura District, East Ogan Komerung Ulu Regency varied, ranging from 1-10 times to 10 times. For more details on the training attended by the sample farmers, it is presented in table 4.7.

Table 3. Identity of Sample Farmers Based on Training Attended in Veteran Jaya Village, Martapura District, East Ogan Komerung Ulu Regency.

No	Training	Number of (People)	Percentage (%)
1	1-10	3	8.571
2	> 10 times	32	91.43

Amount	35	100
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Source: Veteran Jaya Village, Martapura District, Ogan Regency.

East Komering Ulu 2024

Based on Table 4.7 above, the training attended by the example farmers in Veteran Jaya Village, Martapura District, East Ogan Komering Ulu Regency, which dominated was > 10 times, namely 32 people or 91.43%.

C. Level of Technology Application in Rice Farming

1. Seeds

According to Girisonta (1990), rice plants originating from superior seeds grow and develop accompanied by their superior characteristics, especially high production advantages. Rice seeds are paddy produced in a special way and purpose to be sown into plants. Superior seeds in the implementation of the seven agricultural practices referred to are superior varieties that have many superior variety characteristics. Compared to other superior varieties, although one of the traits may be even lose so that in general conditions the production results are high. The use of superior quality seeds can increase production efficiently and effectively. Meanwhile, according to Yandianto (2003), in the seed preparation process there are two things that must be considered, namely seed selection and nursery. Seed selection is carried out in order to obtain seeds that have superior properties. Meanwhile, nursery is carried out so that later the seeds can produce optimally and produce quality rice. Superior seeds are very necessary to achieve satisfactory results, superior seeds can indirectly increase farmers' income. Several superior seeds have been distributed according to land conditions, one of which is the Inpara 3 variety seed. The Inpara 3 variety seed is a seed recommended by the Government for use in tidal swamp land. he advantages of this variety, in addition to being in accordance with land conditions, also have other advantages, including: productivity can reach 7.5 tons/ha, resistant to brown planthoppers, leaf blight, bacteria and good quality To find out the percentage of application of seed technology by farmers in lowland rice farming can be seen in Table 4.11 below.

Table 4. Percentage of Seed Technology Application Level in Paddy Farming in Veteran Jaya Village, Martapura District, East OKU Regency.

Teknology	Implementation			
	Ya	(%)	No	(%)
Variety Inpara 3	35	100	0	0
Seed Selection	20	57,14	15	42,86
Seeding	0	0	35	100
Rate–rate		57,38		47,62

Table 4.11 above shows that the application of technology by farmers to seed technology in rice farming in the research area with a percentage in the high category of 57.38 percent, while the percentage in the low category is 47.62 percent. This shows that farmers have been able to apply seed technology but have not been done optimally, because in the seeding component farmers do not carry it out at all for reasons of saving time and labor use and anticipating the lack of water availability with the changing seasons.

D. Analysis of factors influencing the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency

Factors influencing the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency can be identified using a multiple linear regression analysis model.

The results of the data analysis carried out using SPSS software can be seen in table 4.20 below:

Table 5. Data Analysis Results

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics		
	B	Std. Error				Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF	
1 (Constant)	.065	2.968		.022	.983	-5.831	5.961						
Log_X1	2.039	.038	-.114	2.022	.000	-.115	.037	-.131	8.108	.102	.800	1.251	
Log_X2	.008	.020	-.004	3.039	.001	-.040	.038	-.072	1.004	.004	.931	1.074	
Log_X3	1.091	.045	-.248	2.035	.001	-.179	-.002	-.192	-.211	.203	.669	1.495	
Log_X4	1.003	.103	-.005	2.033	.003	-.207	.200	-.166	-.003	.003	.516	1.937	

a. Dependent Variable: Log_y

Log Y = 0.065 + 2.039X1 + 0.008 LogX2 + 1.091 LogX3 + 1.003 LogX4. From the equation above it can be concluded that

1. The constant value of 0.065 is positive. This indicates that if there are no variables of farm income (X1), training (X2), farm experience (X3), and education (X4) or have a value of zero, then the Application of Agricultural Technology in Veteran Jaya Village, Martapura District, East Ogan Komering Ulu Regency will increase by 0.065 units.
2. The regression coefficient value of rice farming income is 2.039, which means that an increase of one rupiah will cause farmers to implement agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 2.039 times.
3. The training regression coefficient value is 0.008, which means that an increase of one training unit will increase farmers' opportunities. in implementing agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 0.008 times.
4. The value of the land area regression coefficient is 1.091, which means that a one percent increase in the experience of rice farming will increase the opportunities for farmers to implement agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 1.091 times.
5. The regression coefficient value of education is 1.003, which means that an increase of one unit of education for rice farmers will increase the opportunities for farmers to implement agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 1.003 times.

1. Classical Assumption Test

This study uses several tests to determine whether there are deviations from the classical assumptions, including normality tests, multicollinearity tests, and heteroscedasticity tests. The

significance results of the normality test with the Kolmogorov-Smimov test obtained an asymp. Sig (2-tailed) value of $0.878 > 0.05$, which means that the data in this study are normally distributed. The results of the multicollinearity test of all variables show a Tolerance value greater than 0.1 (Tolerance > 0.1) and the VIF value of each variable shows less than 10 (VIF < 10), which means that there is no multicollinearity in the regression model. The results of the heteroscedasticity test using a scatter plot diagram that the points are spread randomly and do not form a particular or regular pattern. This indicates that the nuisance errors have the same variance (homoscedasticity) and it can be concluded that the estimated regression model does not experience heteroscedasticity.

2. Statistical Test

Table 6. Results of Regression Analysis of Factors Influencing the Implementation of Agricultural Technology in Veteran Jaya Village, Martapura District, East OKU Regency

Variabel	Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig
	B	Std. Error			
Konstan	.065	2.968		.022	.983
Log_X1	2.039	.038	-.114	2.022	.000**
Log_X2	.008	.020	-.004	3.039	.001***
Log_X3	1.091	.045	-.248	2.035	.001**
Log_X4	1.003	.103	-.005	2.033	.003**
R. Square	0, 882				
Adjust R. Square	0, 831				
F Hitung	123, 393				0, 000***
F Tabel	1.99				
t Tabel 1 %	1.66216				
t Tabel 5 %	1.98698				

Source: Primary Data Analysis, 2023

Information:

= has a significant effect at a 99% confidence level

= has a significant effect at a 95% confidence level

ns = no significant effect

The Adjusted R Square value is 0.882. The Adj R2 value means that 88.2% of the factors that influence the application of agricultural technology in Veteran Jaya Village, Kecamatan

Martapura OKU Timur Regency can be explained by the independent variables described in the model, such as (X1) income, (X2) training, (X3) education, and (X4) experience in rice farming. Meanwhile, the remaining 12.8% is explained by other variables outside the study, such as weather, climate, farmer age, income, technology and others.

The results of the F test show the results of simultaneous testing of all estimated parameters at a 95% confidence level indicating that the F table value $> F$ count ($123.393 > 2.13$). This can be said that the independent variables including (X1) income, (X2) training, (X3)

education, and (X4) experience in rice farming together have a significant effect on the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency. The results of the t test show that the variables (X1) income, (X2) training, (X3) education, and (X4) experience in rice farming individually have a significant effect on the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency.

The regression coefficient value of rice farming income is 2.039, which means that an increase of one rupiah will cause farmers to implement agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 2.039 times. The t-count value of the rice farming income variable is 2.022 and the t-table at a 5% is 1.98698 so that t-count (2.056) > t-table (1.98698) and the Sig. value is 0.000 < α 0.05. The level of income greatly influences decision making in accepting new innovations. This is in accordance with Lionberger's opinion in Mardikanto et al, (1996) which states that farmers with a high level of income the higher it usually will be the faster it will respond to innovation. The results of Siswandi's research (2016), and Elly et al (2021) stated that the income of rice farming affects farmers in implementing agricultural technology.

Table 4.15 shows the t-value of the training variable of 3.039 and the t-table at a 5% is 1.98698 so that the t-count (3.039) > t-table (1.98698) and the Sig. value of 0.002 \leq 0.05 means that partially the training factor has a significant influence on the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency. The training regression coefficient value is 0.008, which means that an increase in one training unit will increase the chances of farmers in applying agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 0.008 times.

The variable of Rice Farming Experience has a calculated t value > t table, which means that land area has a significant effect on farmers' decisions in implementing agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency at a 99% confidence level. The regression coefficient value of land area is 1.091, which means that a one percent increase in Rice Farming Experience will increase farmers' opportunities in implementing agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 1.091 times. With a long rice farming experience, farmers will be more skilled in overcoming challenges that may occur in ongoing farming, according to research conducted by (Marphy & Priminingtyas, 2019); (Farry Primandita, (Suwanto, 2018); (Rumiati, Suwanto, 2020); (Sri et al, 2016).

The t-value of the farmer education variable (X4) is 2.033 and the t-table at a 5% is 1.98698 so that the t-count (2.033) > t-table (1.98698) and the Sig. value is 0.000 < 0.05, meaning that education has a real influence on farmers' decisions to implement agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency. The regression coefficient value of education is 1.003, which means that an increase in one unit of education for rice farmers will increase the chances of farmers implementing agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency by 1.003 times. Income level greatly influences decision making in accepting new innovations. This is in accordance with Lionberger's opinion in Mardikanto et al, (1996) which states that farmers with higher income levels will usually respond faster to innovation. The results of the research by Siswandi (2016), and Elly et al (2021) stated that education influences farmers in their decisions to implement agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency. The results of the research by Bishu et al. (2018) and Sargazi et al. (2013) stated that farmers with higher education tend to have the capacity to implement agricultural technology that higher than farmers with low incomes.

Conclusion

The application of technology by farmers in rice farming in the research area is in the high category, which is 72.5 percent, meaning that most of the sample farmers in this study have implemented or applied farming in a way that has been recommended by the East OKU Regency government, but the application of technology by these farmers has not been maximized, so there needs to be increased cooperation and better coordination between farmers, agricultural extension officers and related agencies in order to get maximum results in the future. Based on the results of the analysis, it can be concluded that factors (X1) farmer age, (X2) length of education, (X3) land area, (X4) have a significant effect on farmers' decisions to apply agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency.

The most influential factor in the application of agricultural technology in Veteran Jaya Village, Martapura District, East OKU Regency is the experience of rice farming with a standard partial regression coefficient value of 6,049. For this reason, farmers should be more active in activities or meetings, such as socialization and discussion in order to know, understand and get coherent and correct information about the programs to be carried out and farmers who have income from farming should not hesitate to apply agricultural technology.

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