FACTORS AFFECTING FARMERS IN THE IMPLEMENTATION OF INTEGRATED AGRICULTURAL SYSTEMS IN LANGKAK VILLAGE

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Abstract

This research aims to determine the factors that influence farmers in implementing an integrated agricultural system in Langkak village, Kuala Coast sub-district, Nagan Raya regency. This research was carried out from October to December 2022. The analytical method used in this research was the logistic regression analysis method and to determine the Y value using dummy variable data, namely 1 = decision to implement integrated agriculture, 0 = decision not to implement integrated agriculture. This research took 30 farmers as samples using a saturated method based on consideration of who took part in the socialization in the 2022 PPK Ormawa program in Langkak village. The data collection techniques used in this research were interviews and observation. Based on data processing, it shows that the variables age, education, land area, length of farming, and income have a big impact on farmers' decisions to implement an integrated farming system. Although simultaneously only the variables age and length of farming have a significant effect, apart from that they do not have a significant effect on farmers' decisions to implement an integrated farming system.

Keywords: *agriculture; integrated; application; village; step*

1. INTRODUCTION

The agricultural sector is one of the important role holders in the process of increasing the community's economy. The high market demand for vegetable and animal needs makes farmers increase their production to meet the market demand that will be provided, the importance of the agricultural sector for society means that a lot of workers are still needed. From the economic perspective of society, it can be observed that there is a uniqueness to the agricultural sector, if the economic character is specialized in being producers and consumers, so that it can be called a farming household, economic agents also act as producers and consumers (Juliantari 2018). The uniqueness of the agricultural sector with the need for labor influences the interest in working farmers, especially in Aceh. Aceh is a province located on the tip of the island of Sumatra with an area of 58,377 km2 (BPS ACEH 2022). Many Acehnese people work as laborers, even though the potential of the region in Aceh is very large to be used as business opportunities, especially in the fields of agriculture and plantations. This situation means that there are many factors that are not supported by the government, both in terms of financial assistance and the like to support the community. However, there are many ways to solve this problem. One way to offset funding for farming is to form a farmer group in each region. This can increase farmers' interest in programs that develop agriculture.

The farming program aims to improve the welfare of farmers and make things easier for farmers. One program that is very effective is implementing an integrated farming system. Integrated agriculture is a combination of four sub-sectors including agriculture, plantations, animal husbandry and fisheries, aimed at reducing waste in certain conditions and becoming a solution for farmers to increase productivity (KKN-UPM Buayan 2021 and Juliantari 2018). This can be a great opportunity if implemented. Nagan Raya Regency is the target place for implementing an integrated agricultural system, with an area of 3,545km2 and an agricultural area of 16,300.00 hectares and a plantation area of 49,401.14 hectares, which is divided into 10 sub-districts and 222 villages (BPS NAGAN RAYA 2022). This is the best alternative for the community to be able to develop integrated agriculture, especially in Langkak village, Kuala Coast sub-district, Nagan Raya regency.

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Langkak Village is one of the villages that is suitable for the development of an integrated agricultural system because of the potential of natural resources that support it, including in the agricultural, plantation, livestock and fisheries sectors. Langkak village is one of the research targets for agricultural students, carrying out the Ormawa PPK program with the theme "assisting young farmers in Lelek village in institutional formation and increasing integrated agriculture-based competencies" aims to form an institution in order to minimize the capital of farmers and planters thereby reducing costs, by The existence of this institution is a model for other farmers and planters to implement integrated agriculture. Integrated Agriculture is a form of innovation that implements an agricultural system in which there are several subsectors that are related to each other, thus having a positive impact, especially on farmers. The response of local farmers in Langkak Village to the socialization and implementation of activities carried out by the PPK ORMAWA BEM FP UTU team was very influential in the implementation of the agricultural activities they usually carry out. Where, they also take part to contribute to the activities that we carry out. However, not all farmers want to participate in contributing to these activities. Then it can be said that the integrated agricultural innovation that we are implementing in Langkak Village is not yet complete for farmers to decide whether they want to implement it.

A person's decision to carry out an innovation is not easy. because there are many factors that influence when implementing it, for each characteristic farmers prefer to carry out their original habits rather than change their safety zone, act and decide on a decision that is not profitable for farmers, they will not change any concept of their habits unless they make a profit.(Anne Charina 2018) according to (Yosini Daliana 2018), that decisions regarding farmer group programs are influenced by knowledge, technology, education, land area, awareness and attitudes. Based on the description above, the author is interested in carrying out research with the title "Factors that Influence Farmers in implementing an integrated agricultural system in the village of Langkak sub-district. Kuala coast district. Nagan Raya" This research was conducted with the aim of finding out what factors can influence farmers in implementing an integrated agricultural system.

2. RESEARCH METHODS

Location and time of research
This research was conducted in Langkak Village, Kuala Pesisir District, Nagan Raya Regency from July to December 2022.

Data Types and Sources
This type of research is pre-survey research and data sources used primary data and secondary data:

Primary data
Primary data is data collected directly from farmers using a cross section conducted through interviews and observations. The data collected includes: farmer characteristics (name, age, education level, land area, length of farming, and income, as well as other important matters related to research.

Secondary data
Secondary data is data obtained from agencies such as the keucik office and BPS NAGAN RAYA.

Population and Sample
According to Sugiyono (2015) the sample is part of the number and characteristics possessed by the population. The technique for determining the number of samples used in this study is the saturated sampling technique. Saturated sampling technique is the determination of the sample if all members of the population are used as samples. Sampling was carried out by purposive sampling or in a saturated manner, namely the samples were selected based on certain considerations that were adjusted to the research objectives. The entire population was selected in Langkak Village based on the farmers who participated in the socialization of the Ormawa PPK team with the theme "assisting of young farmers in Lelek village in institutional formation and competency improvement based on integrated agriculture." This village has potential in agriculture and plantations so that it can form a group of farmers who are

interested in implementing integrated agriculture with the consideration of farmers and gardeners who are still doing work as farmers and gardeners.

Data analysis technique

In this study, cross section data is used, cross section data is data combined from all farmers and planters in Langkak village at the same time. In describing the data obtained, the researcher used a quantitative method, namely an analysis of data in numerical form, then processed using SPSS version 20 statistical software. The data translation model used in this study is the binary logistic regression analysis equation, with a formula in the form of assistance to the group. target. In determining the value of Y using a binary logistic regression model (Binary Logistics), also known as the logit model. Logistic regression is called a dichotomous response regression model with the dependent variable (application) worth 0 and 1 where in this study:

Y = 1 ; If farmers implement integrated farming

Y = 0 ; If farmers do not implement integrated farming

The initial model of the logistic regression equation in this study is:

$P(x1) = 1/(1+e^{\wedge}(\beta0+\beta1x1+\beta2x2+\beta3x3+\beta4x4+\beta5x5))$

According to Ratnawaty Siata (2016), the model above is a probability model for an event which is influenced by these equation factors which are nonlinear in terms of parameters, then to make the model linear, a transformation process called a logit transformer needs to be carried out. The application of the above model for this research is as follows:

$Ln((P(xi)|(1-P(xi)))=\beta0+\beta1x1+\beta2x2+\beta3x3+\beta4x4+\beta5x5$

$Zi = \beta0+\beta1x1+\beta2x2+\beta3x3+\beta4x4+\beta5x5$

$Y = b0 + b1x1 + b2x2 + b3x3 + b4x4 + b5x5$

Where:

Y : 1 decision to implement integrated agriculture

Y : 0 decisions not to implement integrated agriculture

B0 : constant

x1 : Age

x2 : Education

x3 : Land Area

x4 : Farming Time

x5 : Acceptance

e : error

Variable Boundaries

1. Age
   Age is the age of a person from birth to now (years)
2. Education
   Is the learning of one's knowledge, skills and habits (years)
3. Land area
   Land area is how much land is developed by farmers in the village of Langkat (hectares)
4. Farming for a long time
   Is one experience in cultivating farmer talent and farming profits (years)
5. Reception
6. Is the amount of results obtained from each business undertaken (Rp)

Initial Hypothesis

Age, education, land area, length of farming, and income have a positive effect on farmers who implement integrated farming in Langkak Village, Kec. Kuala Pesisir, Kab. Nagan Raya

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3.   RESULTS AND DISCUSSION

In this research, the tool used to determine the factors that influence farmers in implementing integrated agriculture is the logistic regression test with SPSS software. Where the dependent variable (Y) in this study consists of 2 categories, namely "Applying" which was given (Code 1) and "Not Applying" which was given (Code 0). The independent variables (X) in this study consisted of age (X1), education (X2), land area (X3), length of farming (X4), acceptance (X5). Based on the results of data processing using SPSS, namely the SPSS Logistic Regression test, the results are obtained in table 1.

Table 1. Factors that influence farmers in implementing integrated farming systems \in the Variables in the Equation test

Variables in the Equation

		B	SE	Wald	df	Sig.	Exp(B)
Step 1a	X1	,159	,078	4,142	1	,042	1,173
	X2	,335	,242	1,909	1	, 167	1,398
	X3	-.093	,855	,012	1	,913	,911
	X4	-,313	,136	5,318	1	,021	,732
	X5	,000	,000	,029	1	,865	1,000
	Constant	-7,275	4,271	2,901	1	.089	,001

a. Variable(s) entered on step 1: X1, X2, X3, X4, X5.
Source: SPSS Output Ver 20, (2023)

From table 1, it shows that the Sig column indicates the significant influence of the independent variable on the dependent variable. There is a significant effect if the Sig value is <0.05. It can be seen that the variables that influence farmers' decisions in implementing integrated farming from the five variables, the two that have a significant influence, are age (X1) with a sig value of 0.042 and length of farming (X4) with a sig value of 0.021. Meanwhile, the variables education (X2), land area (X3) and income (X5) do not have a significant effect.

Effect of age (X1) on farmers' decisions in implementing integrated agriculture

The results of the logistic regression explanation show that the age variable does not have a significant influence on farmers' decisions in implementing integrated agriculture with a sig value of $(0.042) < a$ value = 0.05. The Exp(B) value of 1.173 indicates that if there is an increase in the age variable (X1), the opportunity for farmers to implement integrated agriculture will also increase by 1.173. which means that understanding related to integrated agricultural systems is easier for young farmers to understand. This is in line with research (Resti A, 2019) that younger farmers are more responsive to new information and technology. However, all farmers have the same opportunities in implementing integrated agriculture because age does not affect farmers in implementing it.

The effect of education (X2) on farmers' decisions in implementing integrated agriculture

The results of the logistic regression explanation show that the education variable does not have a significant effect on farmers' decisions in implementing integrated agriculture with a sig value of (0.167) > a value = 0.05, an Exp(B) value of 1.398 indicates that if there is an increase in the education variable (X2), then there is no relationship between the contribution of education in implementing integrated agriculture of 1.398. Due to the implementation of integrated agriculture, there is no large influence on the education variable, all farmers can implement an integrated agricultural system without any educational status for each individual farmer. According to Nur Rahmawati (2018), in her research, education is a variable that is not significant for the sustainability of rice farming because it has a P-value

of 0.985 which is greater than α = 10 percent, which shows that education is not significant. The Exp (B) value of the education variable is 1.010 with a coefficient value of 0.010, which means that adding one level of education category has a tendency to increase the level of certified seed selection by 1.010 times. According to Sitty Muawiyah Panurat (2014), based on her research, the results of the regression analysis show that formal education has no effect on farmers' interest with an insignificant contribution of α 6.85 percent. Because farmers need non-formal education more. According to the same research as Asda Rauf (2021), formal education has no effect on implementing the Jajar Legowo planting system, because farmers do not have to be highly educated to implement the Jajar Legowo planting system.

The influence of land area (X3) on farmers' decisions in implementing integrated agriculture

The results of the logistic regression explanation show that the land area variable does not have a significant effect on farmers' decisions in implementing integrated agriculture with a sig value of (0.913) > a value = 0.05. The Exp(B) value of 0.911 indicates that if there is an increase in the land area variable (X3), it reduces the opportunity for farmers to implement integrated agriculture by 0.911. Because sometimes farmers also think about whether or not their land can implement an integrated farming system. However, observations in the field illustrate that all land owned by farmers in Langkak Village has the opportunity to implement an integrated agricultural system. Where, the farmers of Langkak Village do not all have agricultural land which is only in one area, but there are also agricultural lands in other locations. This is why the area of land in the application of integrated agriculture is not significant. Similar research according to Faoeza Hafiz Saragih (2020) The variable land area has no significant effect on Ciherang farming income. This is due to the large land area does not guarantee high production and can also get high revenue. There are several farmers who have large areas of land but the production produced is not comparable, this could be due to farmers being inefficient in carrying out their farming activities.

Effect of length of farming (X4) on farmers' decisions in implementing integrated farming

The results of the elaboration of logistic regression show that the variable length of farming has a significant effect on farmers' decisions in implementing integrated farming with a sig value of (0.021) < a value = 0.05. the Exp(B) value of 0.732 indicates that if there is an increase in the length of farming variable (X4), then the opportunity for farmers to implement integrated farming will also increase by 0.732. Due to the increasing number of lessons and experiences of farmers in carrying out activities in agricultural activities so that it affects this variable and shows that the length of farming has an effect on the application of integrated agriculture. Opportunities for farmers to decide on integrated farming are greater because they have more experience in the world of agriculture, so that integrated farming is easier to implement. In line with research by Asda Rauf (2021) showing that the length of farming variable has a significant positive effect on farmers' decisions, farmers' decisions are increasing in implementing the Jajar Legowo planting system in West Limboto District.

The influence of acceptance (X5) on farmers' decisions in implementing integrated agriculture

The results of the elaboration of logistic regression show that the acceptance variable has no significant effect on farmers' decisions in implementing integrated agriculture with a sig value of (0.865) > a value = 0.05. The Exp(B) value of 1,000 indicates that if there is an increase in the acceptance variable (X5), then all farmers have the opportunity to implement integrated farming of 1,000. Because Langkak Village already has a farmer group, where all farmer members have their respective roles in implementing integrated agriculture, so the acceptance variable does not really have a contribution or role in its implementation. Farmers have various fields and sub-sectors with different commodities so they have the opportunity to unite all sub-sectors in one system.

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Parameter Significance Test

Parameter significance test was carried out to find out whether the parameter estimates obtained had a significant effect on the model parameter significance tests were carried out simultaneously and partially.

Simultaneous test

Simultaneous tests were carried out to determine the significance of the parameters of the model simultaneously (overall). This test can be carried out with the G test with the following hypothesis:

Ho : $\beta 1 = \beta 2 \dots \beta p = 0$ (There is no effect between the independent variables on the dependent variable)

H1: There are at least one $\beta j \neq 0$. With $j = 1, 2 \dots p$ (There is an influence between the independent variables on the dependent variable).

Ho is accepted if $G < X2(a,v)$ and H0 is rejected if $G \geq X2(a,v)$.

To see the level of variation in the data, use the Nagelkerke R Square as in Table 2 and the calculation results are obtained using the SPSS 20 program in the appendix

Table.2 Summary models

Summary models

Step	-2 log likelihoods	Cox & Snell R Square	Nagelkerke R Square
1	25.655a	,342	,474

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Source: SPSS Output Ver 20, (2023)

Based on the table above, the Nagelkerke R Square value is 0.474, so it can be concluded that there is a simultaneous influence between the dependent variable and the independent variable of 47.4%, the rest is explained by other variables outside this model.

4. CONCLUSION

Based on the results obtained, it can be concluded that the variables are age (X1), education (X2), land area (X3), length of farming (X4) and income (X5). The only variables that have a significant effect are age (X1) and length of farming (X4). And other variables have no significant effect. In the Summery Model test based on the Nagelkerke R Square value of 0.433, it can be concluded that there is a simultaneous influence between the dependent variable and the independent variable of 47.4%. In this model, the rest is explained by other variables outside this research.

SUGGESTION

1. For the local government, it would be possible to provide training to farmers in Nagan Raya district, educating them on how to implement an agricultural system that can be implemented where it can benefit farmers.
2. It would be advisable for Langkak village officials to form more than one farmer group, so that an integrated agricultural system is easier to form and implement for farmers.

3. For future researchers who will research the same topic, it would be best to add several other variables outside this research, because in this research the independent variable is not fully able to explain the influence on the dependent variable.

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