FACTORS INFLUENCING THE LEVEL OF ADOPTION OF INNOVATION IN RICE FARMING INSURANCE PROGRAM (AUTP) IN SAWAHAN VILLAGE, LENGKONG DISTRICT, NGANJUK REGENCY

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Abstract

Sawahan Village, Lengkong District has great potential in the rice farming sector, but faces challenges of climate change, decreasing land area, and low farmer participation in the Rice Farming Insurance (AUTP) program. This study aims to identify factors that influence the level of adoption of AUTP program innovations and measure the level of farmer adoption in Sawahan Village, Lengkong District, Nganjuk Regency. The factors analyzed include the area of farm land, education, farmer age, income level, length of farming, innovativeness, and level of participation in organizational groups. The study used a descriptive quantitative method with a sample of 40 farmers participating in the AUTP program. Data analysis was carried out using descriptive methods and multiple linear regression with SPSS version 26. The results showed that farmer experience, area of farm land, farmer income, farmer innovativeness, and level of participation in other programs had a significant effect on AUTP adoption, while age and education did not have a significant effect. The level of AUTP adoption is still low even though there is subsidy support and extension information because farmers still doubt the effectiveness of the program. The study concluded that a more comprehensive socialization strategy was needed through the involvement of community leaders, plot demonstrations, farmer testimonials, simplification of socialization materials, and increasing transparency of the claims process to increase adoption of the AUTP program.

Kata Kunci: Innovation adoption, Rice Farming Business Insurance, AUTP, adoption factors, sustainable agriculture

1. INTRODUCTION

Agriculture plays a strategic role in Indonesia's national economy, not only as a primary food provider, but also as a sector that absorbs a large number of workers and supports the welfare of rural communities. As an agricultural country, Indonesia faces major challenges in maintaining national food security amidst increasing population, climate change, and agricultural land degradation. Based on projections by BPS and FAO, Indonesia's population is estimated to reach more than 330 million people in 2050, placing the country as one of the six most populous countries in the world (Ministry of Agriculture, 2021). To ensure national food security, especially rice production as a strategic commodity, various innovations and policy interventions have been launched by the government, one of which is the Rice Farming Business Insurance (AUTP) program (Adriana et al., 2022).

AUTP is a government program that aims to provide financial protection to farmers from the risk of crop failure due to natural disasters, attacks by plant pests, and extreme climate change. This program was developed as a risk mitigation instrument that is expected to strengthen the sustainability of farming businesses and encourage the adoption of modern and productive agricultural practices. The AUTP scheme includes a premium subsidy of 80% by the government, while the rest is paid by farmers at IDR 36,000 per hectare per planting season (Ardiana & Agusta, 2019). The management of this insurance risk is entrusted to PT. Asuransi Jasa Indonesia (Jasindo) as the sole risk bearer. The synergy between the government and the insurance sector is expected to create an effective social safety net for farmers (Imam & Bahri Siregar, 2020).

Despite its many benefits, the adoption rate of the AUTP program in the field still shows quite high variation. A case study in Sawahan Village, Lengkong District, Nganjuk Regency shows that from 2022 to 2024, farmer participation in the AUTP program experienced significant dynamics. In 2022, only four farmers from two farmer groups participated in the program with a total land area of 3 hectares. This figure increased in 2023 with the involvement of 25 farmers from three farmer groups managing 15 hectares of land. In 2024, although the number of farmer groups shrank to one, namely Sido Mulyo, the number of its members jumped to 40 people with a land area of 10 hectares. This change reflects a pattern of internal consolidation in the structure of farmer groups and shows a positive direction in increasing farmer awareness of the importance of protecting agricultural businesses.

However, behind this trend of increasing participation, there are still various structural and cognitive obstacles that hinder the process of widespread adoption of AUTP. Some farmers are still doubtful about the effectiveness of insurance, especially in terms of claim clarity, the slow process of verifying losses in the field, and negative perceptions of bureaucracy. In addition, most farmers do not fully understand the working mechanism of AUTP and its long-term benefits. This is exacerbated by the lack of massive and ongoing socialization from the program organizers.

In the context of agricultural innovation, AUTP adoption can be analyzed through the framework of Everett Rogers' innovation diffusion theory. This theory explains that the spread and acceptance of an innovation in society is influenced by five categories of actors: innovators, early adopters, early majority, late majority, and laggards. Each category has different characteristics and determinants in accepting an innovation. In the context of AUTP, factors such as education level, age, land area, farming experience, income, level of farmer group membership, and attitude towards risk are important variables that can influence farmers' position in the innovation adoption spectrum. Therefore, understanding the farmer adoption profile and the factors that influence it is crucial in developing strategies to increase participation.

Previous literature shows that farmers' socio-economic and psychological factors play an important role in determining the success of adopting innovative programs in the agricultural sector. Research by Ardiana and Agusta (2019) shows that land area and participation in farmer groups contribute positively to farmer participation in AUTP. Emphasize that the success of partnerships with insurance institutions such as Jasindo is highly dependent on farmers' trust in the institution and the effectiveness of program communication (Imam & Bahri Siregar, 2020). However, most studies still focus on the level of participation without delving deeper into the distribution of farmers in the innovation adoption category or the relationship between factors that influence it. Therefore, an approach that integrates innovation diffusion theory and adoption rate analysis will enrich the perspective in understanding the dynamics of farmer participation.

This research is important because it offers significant theoretical and practical contributions. From a theoretical perspective, this study attempts to link the determinants of adoption with innovation diffusion categories, not just to group farmers, but to understand how each factor influences farmers' tendencies to adopt AUTP. From a practical perspective, the results of this study can be used by policy makers and insurance providers to develop more targeted intervention strategies, such as designing socialization based on adoption categories, simplifying the registration process, and improving claim services.

This study also has an aspect of novelty, namely its approach that integrates determinant factor analysis with adoption classification based on Rogers' framework and its application in the context

of AUTP which is still relatively limited in Indonesian literature. Thus, the results of this study are expected to provide a more comprehensive understanding of farmer adoption behavior and provide applicable recommendations for improving agricultural insurance policies in the future.

In order for the results obtained to be widely useful, this writing is compiled with non-expert readers in mind. The language used is kept informative but simple, so that readers from non-agricultural backgrounds can understand the urgency and context of the problem. The main objective of this study is to analyze the extent to which farmers' socio-economic factors influence the level of adoption of the AUTP program and how each farmer's position is in the category of innovation adoption, with a case study in Sawahan Village, Lengkong District, Nganjuk Regency.

2. MATERIAL AND METHOD

2.1 Location and Sample Determination

This study was designed to explore the factors that influence the level of adoption of farmer innovations towards the Rice Farming Insurance (AUTP) program in the Sido Mulyo Farmer Group, Sawahan Village, Lengkong District, Nganjuk Regency. The main focus is to assess the contribution of individual variables (age, experience, innovativeness, education, income, and land area) and organizational variables (level of participation in farmer groups) in influencing farmers' decisions to adopt AUTP. The uniqueness of this study lies in the integration of the innovation diffusion approach and the measurement of adoption levels based on innovator categories (Rogers), so that it can provide a new perspective on mapping the readiness to adopt innovation in the agricultural sector.

The study was conducted in March 2025 in Sawahan Village, Lengkong District, Nganjuk Regency. This village was selected purposively based on observation data that the Sido Mulyo Farmers Group showed a significant spike in participation in the AUTP program over the past three years. In 2024, this group recorded 40 active members with a cultivated land area of 10 hectares. This phenomenon reflects the dynamics of innovation adoption that are interesting to analyze further, especially from a socio-economic perspective and the personal characteristics of farmers.

This study uses a quantitative approach with a descriptive correlational design. The aim is to analyze the simultaneous and partial influence of several factors on the level of farmer innovation adoption in the AUTP program. By using this design, the study is not only able to detect correlations between variables, but also identify significant contributions from each factor to increasing innovation adoption. This approach is relevant to generate generalizations in the local context while opening up opportunities for developing evidence-based policy intervention strategies.

The population of the study was all members of the Sido Mulyo Farmer Group in Sawahan Village who had participated in the AUTP program in 2024. With a population of 40 people, the sampling method used was saturated sampling (census). This approach was chosen to avoid selection bias and increase the accuracy of inference, given the relatively small population. Each participant was given a random code to maintain confidentiality. Participation in the study was voluntary with verbal and written consent from all respondents.

Data collection was conducted using a combination of primary and secondary quantitative methods. Primary data were obtained through:

a. Structured questionnaires measuring variables of age, experience, income, education, innovativeness, land area, and group participation, as well as indicators of the level of adoption of AUTP innovation.
b. Field observations to understand farmers' actual practices in implementing AUTP.
c. Visual documentation (photos and videos) during the interview and observation process to validate the field context.

Secondary data include official documents from the Department of Agriculture, AUTP participation reports for the last three years, and supporting literature from scientific journals and related government regulations. The questionnaire instrument has gone through a content validation process by experts in the fields of agribusiness and agricultural innovation. A five-point Likert scale was used to measure perceptions and frequency of behavior related to AUTP.

2.2 Data Analysis Method

The analysis was conducted using SPSS version 21. The following are the stages of analysis carried out:

a. Validity Test: Using Pearson Product Moment correlation to measure the suitability of the question items to the theoretical construct. Items are considered valid if the significance value is <0.05.
b. Reliability Test: Using Cronbach's Alpha to measure the internal consistency of the instrument. The value of $\alpha \geq 0.60$ is declared reliable.
c. Classical Assumption Test: Normality Test with Normal P-P Plot graph, Heteroscedasticity Test with Scatterplot Residual and Multicollinearity Test using VIF values (<10) and Tolerance (>0.1).
d. Multiple Linear Regression Analysis to test the effect of each independent variable on the level of innovation adoption (dependent variable). The general equation used is:

$Y = \beta1X1 + \beta2X2 + \beta3X3 + \beta3X4 + \beta3X5 + \beta3X6 + \beta3X7 + e$

Where:
Y = Innovation Adoption Level
X1 = Age
X2 = Gender
X3 = Experience
X4 = Land Area
X5 = Income
X6 = Innovativeness
X7 = Group/Organization Participation Level
β1-10 = regression coefficient value
e = error rate

e. Hypothesis Testing: F test for simultaneous significance, T test for individual influence of independent variables and Determination Coefficient Test (R^2) to measure the explanatory power of the model.
f. Measurement of Innovation Adoption Level: Adoption level data is processed using the score interval of the total Likert scale answers, then classified into three categories: low (≤60%), medium (61–80%), and high (>80%).

3. RESULT AND DISCUSSION

This study aims to analyze the factors that influence the level of innovation adoption in the Rice Farming Insurance Program (AUTP) by farmers in Sawahan Village, Lengkong District, Nganjuk Regency. This study was motivated by the low participation of farmers in AUTP, even though this program has been subsidized by the government up to 80% and is designed as a form of protection against the risk of crop failure. The analysis was conducted using multiple linear regression, focusing on seven independent variables, namely age, education, experience, land area, income, innovativeness, and level of group/organization participation.

Table 1 Multiple Linear Regression Test Results

Variabel Independent	Unstandardized Coefficients			
	B	**Std. Error**	**t**	**Sig.**
Constants	0,260	3,330	0,787	0,437
Age	-0,125	0,242	-0,515	0,610
Education	-0,051	0,071	-0,728	0,472
Experience	0,282	0,216	1,308	0,002
Land Area	0,192	0,166	1,159	0,016
Income	0,275	0,107	2,580	0,015
Innovativeness	0,196	0,080	2,440	0,020
Level of Group/Organization Participation	0,218	0,073	3,012	0,005

Source: Analysis Data Processed with SPSS, 2025

In table 1, the results of the regression test show that five of the seven variables have a significant effect on the level of adoption of AUTP innovation, namely farming experience ($\beta = 0.282$; $p = 0.002$), land area ($\beta = 0.192$; $p = 0.016$), income ($\beta = 0.275$; $p = 0.015$), innovativeness ($\beta = 0.196$; $p = 0.020$), and group participation ($\beta = 0.218$; $p = 0.005$). In contrast, age and education did not show a significant effect ($p = 0.610$ and 0.472, respectively). Simultaneously, all independent variables contributed significantly to the dependent variable with an Fcount value of 11.993 and a significance of 0.000 (<0.05). The R^2 value of 0.724 indicates that 72.4% of the variation in the rate of innovation adoption can be explained by this model.

This finding supports Rogers' (2003) theory of innovation diffusion, which states that innovation adoption decisions are influenced by internal factors such as individual innovativeness, as well as external factors such as institutional support and group membership. Farmers who are more active in farmer groups tend to be more open to innovation because they are exposed to more information, experience strong social influence, and have easier access to technical support. High innovativeness also drives adoption tendencies because farmers with these characteristics are more willing to take risks in trying new technologies or programs.

Interestingly, farming experience proved to be a significant factor. Farmers with long experience tend to understand climate and crop risks, so they are more aware of the importance of protecting their business through insurance. This result is in line with research (Utami et al., 2024), which shows that experience contributes to risk perception and readiness to accept protection-based interventions. Land area also proved significant, indicating that farmers with larger production assets tend to be more concerned with risk mitigation efforts and utilize AUTP as a capital protection strategy.

The striking differences in this study appear in the education and age variables. Unlike the results of (Fajar Mustaqim et all, 2022) study which stated that education level significantly affects participation in AUTP, this study shows that both high and low formal education have no significant impact on adoption decisions. This can be explained by the characteristics of respondents who generally rely on empirical experience and the role of agricultural extension workers as a source of information, so that formal education is not the only route to access innovative information.

Likewise, age is not a significant determinant, indicating that both young and older farmers can be open or closed to innovation depending on other factors such as innovativeness and group support.

The level of farmer innovativeness, classified based on Rogers' adoption categories (Innovator, Early Adopter, Early Majority, Late Majority, and Laggard), also provides an interesting picture. The majority of respondents (75%) are in the Early Majority, Early Adopter, and Innovator categories. This shows that there is great potential for increased participation if structural and informational barriers can be overcome. This study also shows that participation in farmer groups has a significant impact on innovation adoption. This supports the study of (Sayugyaningsih et al., 2022), which shows that social dynamics within groups greatly determine the success of community-based programs such as AUTP.

However, the general adoption rate of AUTP in Sawahan Village is still relatively low. Although most farmers showed a positive attitude, doubts about the effectiveness of the program, the complexity of the claim process, and past negative experiences are obstacles. This study shows that the technical and institutional aspects of the program need to be improved in order to increase farmer confidence. The difference between the results of this study and the findings of (Utami et al., 2024), which stated that intensive extension can increase adoption, shows that the effectiveness of extension depends not only on intensity but also on the quality of communication and the relevance of the messages conveyed.

Significantly, this study highlights that to increase the adoption rate of AUTP, interventions carried out are not sufficient to rely solely on formal counseling, but must involve a community-based approach and mapping of adopter categories so that strategies can be tailored to the characteristics of each segment. The exploration of factors that influence the adoption of innovation also opens up space for the development of policy interventions based on empirical data.

Thus, this study not only strengthens the results of previous studies in several aspects, but also offers a critical correction to the general assumption about the importance of formal education and age in the adoption of agricultural innovations. This study shows that socio-community factors and practical experience are more dominant in influencing the adoption of the AUTP program, providing a new contribution to the development of an innovation diffusion approach in the Indonesian agricultural sector.

4. CONCLUSION

Based on the results of the research that has been conducted on the level of innovation adoption in the Rice Farming Insurance (AUTP) program, the following conclusions can be drawn:

1. Based on the results of the study, the factors that influence the level of innovation adoption in the Rice Farming Insurance (AUTP) program include farmer experience, area of farm land, farmer income, farmer innovation, and level of participation in other programs. Farmer experience, land area, income, and innovation have a significant effect on the decision to join this program, while the age and education factors of farmers do not show a significant effect. External factors such as government policies and ease of access to information also play an important role in increasing the level of innovation adoption by farmers in AUTP.
2. The level of innovation adoption in the AUTP program among farmers is still relatively low. Although various external supports have been available such as subsidy policies, information from extension workers, and ease of administration, many farmers still doubt the effectiveness and benefits of this program in the long term. Although external factors and innovation have been proven to have a positive effect, a more comprehensive and contextual approach is still needed in socializing the program, including building trust and showing concrete evidence of the success of the AUTP program.

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