IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 14, Issue 10 Ser. I (October 2021), PP 57-65
www.iosrjournals.org

Analysis of Ideal Premium on Agricultural Insurance System Based on Resources of Risk in Order to Protect Farmers from The Threat of Loss of Income Due to Harvest Failure in Banjar District

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Abstract:
Background*: The primary forms of risk that farming households experience are weather uncertainty, pests and plant diseases, and product costs. Insurance is one of the financial mechanisms used to spread risk, such as crop failure.*
Since 2012, the Ministry of Agriculture has launched rice Farming Business Insurance , which aims to cover farmers' working capital in crop loss due to floods, droughts, or plant pest organism attacks . However, upon closer examination, there is a problem of farmers losing interest in insuring their farming activities, indicating a decline in the government's aim achievement. One reason farmers are hesitant to participate in AUTP is that they cannot agree on the value of the premium paid versus the value of the claim/benefits acquired. On this basis, it is worthwhile to examine the methodology used to determine the agricultural insurance premiums that will be levied on farmers.
Results*: According to the research findings, the possibility of crop failure occurring during each planting season in Sungai Alat Village, Astambul District, Banjar Regency is 30% due to flooding. Each growing season, the smallest percentage is 5%, caused by rats, caterpillars, maggots, and diseases such as leaf fall.*
According to the Value at Risk (VaR) analysis results, the impact of losses on the number of losses due to crop failure occurrences on each farmer will reach a maximum value of IDR 4,375,516 - per hectare per planting season. Whereas the probability of crop failure during each planting season is 30% due to flooding, the probability of crop failure during each growing season is 5% due to rats, caterpillars, maggots, and illnesses as a leaf.
The risk analysis results of rice production and the calculation of the ideal premium for agricultural insurance in Sungai Alat Village, Astambul District, obtained a total premium value of Rp. 142.466,- per hectare for each growing season. This value is smaller than the premium set by Jasindo, which is IDR 180,000. Based on this, it is necessary to arrange insurance premiums based on location and production risk. If the agricultural insurance system is to be implemented ideally, farmers can become participants in agricultural insurance without being constrained by high premium prices.
The reluctance of farmers to participate in agricultural insurance in addition to internal factors (such as age, education, number of family dependents, land area and experience in farming and work outside of farming) also external factors (intensity of crop failure, Jasindo socialization and activeness in AUTP socialization) so that an active role is needed and cooperation from the government and the private sector (Jasindo) in the form of synergistic socialization to protect farmers from the threat of loss of income due to crop failure.
Key Word*: Agricultural insurance, risk farming, paddy*

Date of Submission: 13-10-2021 Date of Acceptance: 28-10-2021

I. Introduction

The primary forms of risk that farming households experience are weather uncertainty, pests and plant diseases, and product costs (Patrick et al., 1985). Risks to production and lower output can be attributed to climate change and high plant pests and diseases. Rice productivity was reduced due to a lack of water during the dry season and the high intensity of pests and plant diseases during the rainy season.

As is the case in most Indonesian provinces where the majority of the population works as farmers, South Kalimantan continues to rely heavily on agriculture, particularly rice crops, for economic development.

Insurance is one of the financial mechanisms used to spread risk, such as crop failure. Agricultural insurance is inextricably linked to the risk transfer of farming to third parties (institutions/private enterprises or government agencies) in exchange for a fixed premium payment. Farmers confront dangers, most notably crop failure due to natural disasters or attacks by plant-disrupting organisms. Thus, agricultural insurance is critical to protecting farmers from large losses and ensuring that they have enough operational money earned from insuring their farms to finance farming the following season.

However, statistics indicate that a large number of farmers do not engage in these activities. Farmers are hesitant to join AUTP because they disagree with the value of the premium paid about the value of the claim/benefits acquired. On this basis, it is worthwhile to examine the methodology used to determine the agricultural insurance premiums levied on farmers. Premiums must be established on a sound basis to be affordable to farmers while simultaneously reflecting the value of risk compensation and providing advantages (profit) to insurance providers.

The study's overall purpose is to identify rice cultivation risks and establish the best premium for AUTP rice in Banjar Regency.

II. Material And Methods

The investigation was purposefully limited to one sub-district within Banjar Regency, namely Astambul District. The selection is still based on the subdistrict's greatest AUTP claim in 2019, which is 162.43 ha valued at Rp. 974,580,000.

Analysis Methods and Procedures: Data analysis carried out in this study consisted of qualitative analysis and quantitative analysis.

Descriptive Analysis: The descriptive analysis method is one of the approaches used in this research. This analysis method is used to describe qualitatively the sources of risk of rice farming production results and management techniques/management in managing the risks carried out by rice farmers in Sungai Alat Village, Banjar Regency. Assessment through this method approach will be known subjectively.

Risk Probability Measurement: Risk measurement is typically divided into two dimensions: risk probability estimation and risk effect estimation (Djohanputro 2008). The first risk measuring metric is the probability of occurrence, which indicates that danger will occur. The likelihood of a danger arising can be assessed using historical data on crop failure rates. The standard value approach is used to determine the probability of risk occurrence (z-score).

$$\boldsymbol{Z} = \frac{x - \bar{x}}{S}$$

Where :

Z = Risk opportunity of rice farming production
S = Standard deviation of production risk
$\tilde{x}$ = Average value of risky events
x = Risk limit that is considered still profitable and determined by the respondent farmer

If the z-score obtained is negative, then the value is left of the average value on the normal distribution curve and vice versa. If the z-score is positive, then the value is to the right of the normal z distribution curve.

Value Probability of occurrence of the risk: The probability of the occurrence of production risk can be obtained from the z distribution table (normal) by searching for the z value on the left and the top; the meeting between the z values in the contents of the table is the probability sought.

Risk Impact Analysis: Measurement of the Impact of risk with the VaR method. This analysis was conducted to measure the impact of crop failure risk on rice farming in Astambul District. The Value at Risk (VaR) method can be calculated using the following formula (Kountor 2008):

$$\boldsymbol{VaR} = \bar{\boldsymbol{x}} + z\left(\frac{S}{\sqrt{n}}\right)$$

Where :
VaR = impact of losses caused by risky events
$\tilde{x}$ = Average value of losses from risky events
Z = z value taken from the normal distribution table with = 5%
S = Standard deviation of losses due to risky events

n = number of respondents

Premium Calculation Analysis: Premiums are payments made by the insured to the insurer in exchange for the insurer assuming risk. As with general insurance, agriculture insurance rates can be calculated using the same process as property insurance premiums.

The class rating was utilized in this study, which is a method for establishing the price of insurance premium rates that are frequently used nowadays. The class rating approach is predicated on the idea that the same causes will determine the insured's future losses. The risk that production will result in crop failure is determined in this situation by the same risk source element as in prior events. The determined tariff has a significant impact on assessing remuneration and compensating incurred expenses (expense loading). As a result, precise measurements are required to calculate each of these components. The data required in this situation is the impact of rice farmers' crop failure losses. Expense Loading is indicated as a percentage of the tariff or as a specific dollar amount. The fraction of the premium used to cover losses is the pure premium if expressed in monetary terms or the projected loss ratio if expressed in percentage terms. The premium rate is calculated as follows:

Pure premium = Total Impact of losses due to risk of crop failure/number of exposure units used

After determining the pure premium value, or the portion of the premium rate that is used solely to pay compensation and loss-related costs, the next step is to determine the gross rate, which is the value of the premium rate that will be charged to farmers, the amount consisting of pure premium plus expense loading, which includes other expenses, insurance company profits, and the existing contingency margin. Typically, the expense loading is represented as a percentage of the gross rate and expense ratio. The expense ratio refers to the percentage of total revenue available for expenses and earnings.

Gross Rate = Pure premium/(1- expense ratio)

Factors influencing farmers' reluctance in the AUTP program: Logistic regression analysis is used to determine the factors that influence farmers' response to the AUTP program because the dependent variable (Farmers Participation) is categorical data. In this study, households categorized as farmers did not participate in AUTP = 0, while farmers participated in AUTP = 1.

The logistic regression model for farmer participation in the AUTP program is as follows:

$Yi = Zi =$ $Yi = Zi = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$

Where :

Y = Participation of farmers in the AUTP program
α = intercept
βi = Logistics coefficient (from 1,2,…,9)
X_1 = Activity in the group (frequency)
X_2 = Area of cultivated land (ha)
X_3 = Experience in farming (years) (1 = < 5 years; 0 = > 6 years)
X_4 = Land ownership status (1= rent; 0 = own)
X_5 = Side job (1 = none; 0 = yes)
X_6 = Deadline for registration (days)
X_7 = Maintenance of rice plants (1 = not maintained; 0 = maintained)
X_8 = Socialization of Jasindo (1 = rarely; 0 = often)
X_9 = The activity of officers in the field (1 = rarely; 0 = often)

III. Result and Discussion

Rice Farming Risk Analysis and Agricultural Insurance Development in Banjar Regency

Identify Sources of Risk Coverage

Identification of sources of risk coverage is the first step in conducting a risk analysis of production yields for rice commodities. Identifying risk sources is carried out using qualitative methods to find the main risk factors that cause rice production risks, especially crop failure. Identification of risk sources can be made by obtaining primary data, namely, directly from rice farmers in Sungai Alat Village, Astambul District, Banjar Regency through the interview method.

Rice farming activities in Sungai Alat Village, Astambul District, Banjar Regency have several main factors that cause production risk in rice plants. Farmers believe this source of risk to cause crop failure if it is not addressed by local farmers. Factors that cause the risk of rice production in Sungai Alat Village, Astambul District, Banjar Regency can be divided into plant pest organisms and nature, such as floods and high iron content.

Probability and Risk Impact Analysis

The probability value of the risk value of rice production can be measured through cross-section data in the form of data on the low productivity of rice farmers caused by the incidence of crop failure. The data taken is the percentage of low harvests caused by crop failure incidence compared to normal harvests from rice farmers taken from 60 respondents. The summary of the risk probability analysis results for rice farmers in Sungai Alat Village, Astambul District, can be seen in Table 1 below.

Table 1. Risk probability calculation results

Average	28.14%	26.35%
St. Deviation	17.90%	17.14%
X	50%	50%
Z	1.78	1.96
Values in table Z	0.038	0.02442
Risk Probability	3.8%	2.4%

The risk analysis carried out is to find the probability or risk opportunity of harvest failure events detrimental to rice farmers in Sungai Alat Village, Astambul District. The data used uses the percentage of harvest between low harvests due to risk exposure with normal harvests for each respondent. The results of calculations on existing data indicate the percentage of possible risks from the yields expected by rice farmers. Table 1 shows the low average harvest experienced by farmers in Sungai Alat Village, Astambul District, 26.35% of the normal harvest. The yield of rice productivity at low harvest shows the probability level of risk from the yield of rice production of 2.4%.

The level of opportunity or risk probability of the rice production is determined by the normal production value of the farmer, or the value at which, at the time of the harvest, the farmer does not experience a loss even though the harvest does not reach the normal yield, which is 65% of the total normal harvest for each growing season. This value was determined by the rice farmers in Sungai Alat Village, Astambul District, based on interviews with each farmer. According to local rice farmers, yields of 65% of the normal harvest each season will not harm the rice farmers, even though these farmers certainly have almost no profit from rice cultivation due to costs during cultivation activities, such as maintenance costs, medicines, and fertilizers. With this value, the possibility or chance of risk from rice production results is 2.4%. The Z value of 1.96 with a positive sign indicates that the decline in rice production is to the right of the average normal distribution. So that through table z, the number 0.02442 is obtained, which is the value of the opportunity for the risk to occur in rice production.

After analyzing the opportunity for the occurrence of risks in rice production in Sungai Alat Village, Astambul District, the next step is to find and analyze the impact of these risks. The impact of detrimental risks to farmers occurs due to the sources of risk previously mentioned, resulting in events that threaten the yield of rice risks, such as crop failure. The target value of the productivity as a reference is the same as before, which is 65% of the total normal harvest each season. Losses experienced by farmers will be measured based on the selling price of each farmer to intermediaries, which ranges from Rp. 60,000 to Rp. 65,000 per bushel. The magnitude of the detrimental impact on production targets that are not achieved can be determined using the Value at Risk (VaR) method, as shown in table 2.

Table 2. Calculation of risk impact results

Average loss	Rp 6 526 769	Rp 5,352,786.56
Standard Deviation	Rp 4 034 292	IDR 3,308,636.17
Z	1.65	-1.62
VaR	Rp 7 682 020	Rp 4,375,516.87

Rice farmers in Sungai Alat Village, Astambul District, generally cultivate Siam Saba rice varieties with low productivity results when harvest failure occurs. The average does not reach the target in each planting period. Data obtained from respondents, namely rice farmers in Sungai Alat Village, Astambul District, shows that the average loss experienced due to low production reaches IDR 5,352,786 per harvest season. The value of the z-table distribution taken at the 5% level shows the Value at Risk that occurs to each farmer, which is IDR. 4,375,516 - per hectare for each growing season. These results indicate that the level of losses due to crop failure events for each farmer will reach a maximum value of IDR 4,375,516 - per hectare per planting season.

The impact of losses suffered by farmers is caused by the lack of productivity for each harvest targeted by farmers and the price at harvest.

The calculation of the probability and impact of this risk is calculated with the assumption of multiple peril, namely the possibility and impact due to the risk of crop failure is calculated based on the total loss with all possible causes of risk, such as pest attacks and weather factors. If translated based on the source of risk coverage, the probability of the risk of crop failure in Sungai Alat Village, Astambul District can be described in table 7. Based on the calculation results, it is known that for each planting season, the probability of risk of crop failure for each planting season for the largest is 30%. It was caused by flooding, while the smallest probability for each growing season is 5% caused by pests of rats, caterpillars, maggots and diseases such as leaf fall.

Table 3. Probability of crop failure risk based on factors causing crop failure

a. Incidents of crop failure due to pest attacks and their impacts

No	% Damage	Damage	Causative factor
1	20%	on the crop, resulting in a 20% reduction in yield	Gold snails, leafhoppers, and blast disease
2	15%	on the crop, resulting in a 15% reduction in yields	Planthopper + Rat
3	5%	on the crop, so that the harvest is reduced by 5%	Rat
4	5%	on the crop, so that the harvest is reduced by 5%	Leaf caterpillars and hollows
5	5%	on the crop, so that the harvest is reduced by 5%	Stake and Leaves

b. The incidence of crop failure due to natural factors and their impacts

No	% Damage	Damage	Causative factor
1	30%	During the Taradak and Trace phases, so it is necessary to repeat the activity, the yield of the harvest is not affected; it is just that the costs increase because they have to reuse seeds and waste energy	Flood
2	30%	Occurs in crops, resulting in reduced yields by 30%	Flood
3	10%	Occurs in the crop, so the harvest is reduced by 10%	Iron (Fe) Poisoning

Ideal Premium Determination and Coverage for Agricultural Insurance: The premium calculation analysis is carried out after the data regarding the impact due to the risk of production results have been known. The calculation of premiums for rice commodities in Sungai Alat Village, Astambul District, is carried out using the same method for calculating premiums for property insurance. This method of determining premiums and coverage uses the *Yield Losses* method, according to Itturioz (2009), which is based on the amount of loss that is not limited to the type of disaster causing the loss (*Multiple Peril Crop Insurance*). In measuring premiums, the first step is to analyze the amount of pure premium needed by dividing the amount of the impact of losses due to the risk of crop failure by the number of insurance exposure units, in this case, the total area of rice farmers' land in Sungai Alat Village, Astambul District, which is 280 hectares. The amount of loss impact used is the total loss that occurs in one growing season based on the possibility of crop failure. Based on the previous risk probability calculation, it was found that the probability of the occurrence of crop failure in one growing season was 2.4%. This shows that in one planting season, 2.4% of the total rice field area in Sungai Alat Village, Astambul District, 280 hectares, will be threatened with crop failure or possibly 6.72 hectares per planting season. With the largest impact value of Rp. 4,375,516., - per hectare per planting season (through VaR calculation), the total possible loss due to crop failure in Sungai Alat Village, Astambul Subdistrict, each planting season is Rp. 29,918.034.-. The pure premium value or net premium is Rp 106,850 per hectare through the following pure premium calculation.

Pure premium = (amount of loss impact due to the risk of crop failure)/ (Number of exposure units used)
Pure premium = (Rp 29,918.034.-.)/ 280 ha = Rp 106,850.12.- per hectare

The net premium value is the portion of the premium used to pay compensation to farmers as insurance participants. Meanwhile, the total premium value that farmers will charge consists of the net premium value plus expense loading, which is part of the total premium value used for other expenses, including for the insurer's profit and expenses for future events that have an element of uncertainty. The expense loading value, which is represented as a percentage, is also called the *expense ratio.* In calculating the total premium for this agricultural insurance, the researcher assumes that the insurer requires an *expense ratio* of 25%. This assumption shows that 25% of the total premium charged to the insured or the farmer is a premium component intended to finance the insurance company's operations (*cost of operation*) and the profit share for the insurance company. So, by calculating the total premium value charged to farmers in Sungai Alat Village, Astambul District, the total premium value is Rp. 142,466- per hectare for each growing season.

Gross premium = (pure premium)/ (1-expense ratio)

Gross premium = (Rp 106,850.12.- per hectare)/(1-25%) = Rp 142,466.- per hectare

Rice farming activities are carried out by farmers, one of which is to get cash income. On average, rice farmers in Sungai Alat Village, Astambul District, receive income from rice farming, ranging from Rp. 15,312,500 to Rp. 19,687,500- per hectare for each growing season. With a total cost of between Rp 12,000,000 - Rp 12,500,000, - / ha. The premium value that farmers can pay for each growing season reaches 4.5% of the total value of farmers' profits. Premium payments can be made based on the land owned by each farmer.

Factors Affecting Farmers' Reluctance to Participate in the AUTP Program

In this study, the analysis used was logistic regression. Logistic regression is used because the dependent variable is in the form (Y=1 and Y=0). Before assessing the influence of variables, the model is assessed first. The model is declared usable through certain criteria through the *Omnibus Test of Model Coefficients, Hosmer and Lameshow Test, and Nagelkerke R Square.*

Model Rating: Based on the omnibus test of model coefficient, the significance value of the model is 0.00. The significance of the model is smaller than the level of significance = 0.05 (0.00<0.05). This shows that the model is significant, so it can be said that there is at least one independent variable that has a significant effect on the dependent variable. *Negerlkerke R Square* value is 0.53 . This means that the variables used in this logistic regression model can explain the variation in farmer decisions by 53%. Meanwhile, 47% of the other variables are explained by the error element. Table 4 shows the influence of internal and external factors on the attitude of farmers to participate in the AUTP program.

Table 4. The results of the logistic regression of factors that influence farmers' attitudes in participating in AUTP

Variable	AUTP participation: (1) not following (0) following			
	B	SE	wald	Exp(B)
Constant	0.393	0.542	0.527	1.482
Age	-0.485	0.196	0.013	1.625
Education	0.619	0.199	0.254	0.539
Number of dependents Family	-0.410	0.000	0.249	0.664
Land area	0.319	0.622	0.017	0.727
Experience ber farming	0.001	1.438	0.702	0.999
Work outside the farm	-0.009	1,229	0.014	0.991
Intensity of crop failure	0.050	0.187	0.015	1.051
Jasindo socialization	0.318	1,401	0.012	1.374
Activeness in AUTP socialization	0.393	1.166	0.028	1.625

Farmers' Internal and External Factors

The factors that influence the participation of farmers in the AUTP are divided into two, namely internal factors and external factors. Internal factors are owned or derived from farmers, and external factors are factors that cause external factors. In this study, the internal factors that influence the reluctance/involvement of farmers in the Rice Farming Insurance program include age, education, number of dependents, land area, farming experience, and work outside of farming. Meanwhile, external factors that influence farmers' reluctance/involvement in the Rice Farming Insurance program include the intensity of crop failure, the intensity of socialization from Jasindo, and the activeness of farmers in AUTP socialization.

Internal factors

1. Age (x_1): The older the farmer's ages, the lower the desire to participate in the Rice Farming Insurance program. It is suspected that the younger the farmer's age, the more open his mind will be to new things that are expected to be profitable. The older the farmer, the more closed his mind will be, and it will not be easy to accept new things. Based on the comparison of the probability of the age variable at the odds ratio or (Exp.) B with a value of 0.612 indicates that the opportunity to participate in the AUTP program for farmers who have a younger age is 0.612 times higher than farmers with older age.
2. Education (X_2) : The education referred to in this study is the level of education whose teaching and learning process is carried out in traditional schools. Education is suspected to affect the participation of farmers in the AUTP program. The higher the level of education of farmers, the mindset will be better than farmers with lower levels of education. Farmers who have a higher level of education will think that the existence of AUTP will reduce the level of losses during crop failure, so farmers with a higher level of education are likely to be interested in the AUTP program. The logistic regression analysis results show a positive coefficient value indicating that the higher the level of education, the higher the level of participation of farmers in the AUTP program. Based on the value of the odds ratio or (Exp.)B of 0.539 shows that farmers with higher education opportunities are 0.539 times higher to participate in the AUTP program than farmers with lower education.
3. Number of Family Dependents (X_3): The number of family dependents referred to here is the number of family members who live in one house, and life financing is carried out together. The smaller the number of dependents, the higher the desire to participate in the AUTP program. This is because the greater the number of family dependents, the higher the expenses. The coefficient on the logistic regression analysis showed a negative value indicating that the initial assumption was by the results of the study. A negative value indicates that the smaller the number of dependents of the farmer's family, the higher the desire to participate in the AUTP program.

   Based on the comparison of the opportunities for the farming experience variable at the odds ratio or (Exp.)B with a value of 0.644, which indicates that for farmers who have a smaller number of family dependents, the chance of participation in the AUTP program is 0.644 times greater than farmers who have larger dependents.
4. Land Area (X_4): The area of land is suspected to affect the participation of farmers in the AUTP program. The wider the farmland owned by the farmer, the higher the risk of failure, the higher the level of participation of the farmer. The area of this research area is measured in hectares. The logistic regression analysis results show a positive coefficient value indicating that the larger the land owned by farmers, the higher the desire to participate in the AUTP program.
5. Farming Experience (X_5): Farming experience is the page where farmers carry out agricultural cultivation, which is measured in units of time (years). The coefficient on the logistic regression analysis shows a positive value indicating that the longer the experience of farmers in implementing their farming, the higher the willingness of farmers to participate in the AUTP program. Based on comparing the odds of the farming experience variable at the odds ratio or (Exp.) B with a value of 0.999 shows that farmers who have longer farming experience have a 0.999 times higher chance of participating in the AUTP program than farmers with lower farming experience.

   Farmers with longer experience in farming will find it easier to implement their farming. In addition, the longer the experience, the more risks experienced by farmers and the more precautions that have been taken when problems occur in farming, both technical and non-technical problems. The AUTP program is a form of financial risk transfer to crop failure losses that farmers will experience. Farmers with longer experience will be more interested in joining this program because they know the risk of possible crop failure.
6. Work outside of farming (X_6) : Non - farm work is carried out by farmers, such as trading and construction workers. The higher the intensity of work outside the farm, the less the activities of farmers on their farms.

   The coefficient on the logistic regression analysis shows a negative value, indicating that the more jobs outside the farm, the lower the desire to participate in the AUTP program. Based on the comparison of opportunities for non-farm employment variables at the odds ratio or (Exp.)B with a value of 0.991 shows that farmers who have jobs outside of farming have the opportunity to participate in the AUTP program 0.991 times lower than farmers who only farm.

External Factors

1. Intensity of crop failure (X_7): This study's intensity of crop failure was formed in a dummy variable, namely frequent crop failures and infrequent crop failures. The intensity of crop failure is suspected to affect the participation of farmers in the AUTP program. When farmers with higher intensity experience crop failure, they will be more interested in participating in the AUTP program than farmers with lower intensity experiencing crop failure.

Based on comparing the probability of the variable intensity of crop failure at the odds ratio or (Exp.)B with a value of 1.051 shows that the chances of farmers with higher intensity of harvest failure to participate in the AUTP program are 1,051 times compared to farmers with lower intensity of crop failure.

2. Socialization from Jasindo (X_8) : AUTP information is suspected of influencing farmers' participation in the AUTP program. The more socialization of AUTP information obtained by farmers, Based on the comparison of the opportunity for the variable of socialization by Jasindo about AUTP at the odds ratio or (Exp.)B with a value of 1.374 shows the opportunity for farmers who know information related to AUTP to participate in the AUTP program 1.374 times compared to if farmers did not receive socialization related to AUTP information.
3. Activeness in AUTP Socialization (X_9): Extension workers and Jasindo carried out socialization related to AUTP. The active participation of farmers in the socialization of the AUTP program is expected to provide feedback between extension workers and farmers. So because the information obtained is quite clear, the impact will increase the participation of farmers in the AUTP program.
   Based on comparing the odds of the AUTP information variable at the odds ratio or (Exp.) B with a value of 1.625 shows that the opportunities for farmers who actively participate in the socialization related to AUTP to participate in the AUTP program are 1.625 times compared to farmers who do not participate in the socialization. This is because the participation of farmers related to AUTP is appropriate to determine the participation of farmers in the AUTP program.

ACKNOWLEDGEMENTS

The completion of this research could not have been accomplished without the support of Lembaga Penelitian dan Pengabdian Masyarakat (LPPM) of Lambung Mangkurat University for their continued support and encouragement through "Hibah Penelitian Dosen Wajib Meneliti" (PDWM) in 2021 with University PNBP Financing at the University of Lambung Mangkurat for Fiscal Year 2021 MADYA CLUSTER Number: 009 .9/UN8.2/PL/2021. We offer our sincere appreciation for the opportunities.

IV. Conclusion

Conclusion

Based on the results of the research conducted and based on the discussion, several conclusions can be drawn as follows:

1. Factors that cause the risk of rice production in Sungai Alat Village, Astambul District, Banjar Regency can be divided into plant pest organisms and nature, such as floods and high iron content.
2. The analysis results using the Value at Risk (VaR) method show that the impact of losses on the level of losses due to crop failure events on each farmer will reach a maximum value of Rp 4,375,516 - per hectare per planting season. Farmers suffer losses due to low productivity for each crop desired by farmers and the price at harvest.
3. For each planting season, the probability of crop failure risk for each growing season for the largest is 30% caused by flooding, while the smallest probability for each growing season is 5% caused by rats, caterpillars, maggots and diseases such as leaf area.
4. The calculation results of the ideal premium that will be imposed on farmers in Sungai Alat Village, Astambul District, obtained a total premium value of IDR 142,466 - per hectare for each growing season.
5. Factors that influence the reluctance of farmers to participate in the AUTP Program are influenced by internal factors such as age, education, number of dependents in the family, land area and experience in farming, and work outside of farming. In contrast, internal factors are the intensity of crop failure, Jasindo socialization and activeness in AUTP socialization.

Suggestion

1. The risk analysis results of rice production and the calculation of the ideal premium for agricultural insurance in Sungai Alat Village, Astambul District, obtained a total premium value of IDR 142.466,- per hectare for each growing season. This value is smaller than the premium set by Jasindo, which is IDR 180,000. Based on this, it is necessary to arrange insurance premiums based on location and production risk. If the agricultural insurance system is to be implemented ideally, farmers can become participants in agricultural insurance without being constrained by high premium prices.
2. The reluctance of farmers to participate in agricultural insurance, apart from internal actors as well as external factors, requires an active role and cooperation from the government and the private sector (Jasindo) in the form of synergistic socialization to protect farmers from the threat of loss of income due to crop failure.

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