

Determinant Factors for Cattle Insurance as a Risk Management Strategy

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ABSTRACT

Cattle farmers in Gunungkidul Regency face several cattle diseases such as Helminthiasis, Anthrax, Downer Cow Syndrome, and Intoxication in which these diseases mostly attack female cows. To prevent financial loss for the farmers, the government facilitates them with cattle insurance. This study aims to determine the reasons and the cattle farmers' willingness-to-pay for the cattle insurance by conducting a survey addressed to 100 cattle farmers and identifying the factors related to it. This study used a Contingent Valuation Method in estimating the cattle farmer's WTP. The various factors that influence the farmer's WTP were analyzed by using natural logarithm regression models. Based on the results of the study, it was found that the willingness-to-pay for cattle farmers who did not participate in cattle insurance are 22,600 IDR and farmers who participate in cattle insurance are 36,320 IDR. Education, household income, and farmers' interest in the insurance were positively effecting toward the farmers' willingness-to-pay. However, age and the number of families showed the negative ones toward the farmers' willingness-to-pay.

Keywords: Cattle Insurance, Cattle farmers, CVM, Willingness to Pay.

INTRODUCTION

Livestock products are increasing and the worldwide meat production will also double increase from 258 to 455 million tons (Rojas-Downing *et al.*, 2017; Wright *et al.*, 2012). This growing demand is both an opportunity and a challenge for the sustainability of the livelihoods of more than one billion cattle farmers (Escarcha *et al.*, 2018). Challenges that are faced by the farmers can be in the form of loss of their livestock due to diseases and hunger (Mekuyie *et al.*, 2018).

In Gunungkidul Regency, the diseases that are often faced by cattle farmers and require special handling are Helminthiasis, Anthrax, Downer Cow Syndrome, Bovine Ephemeral Fever, Indigestion, and Intoxication. This happens because the

cases of these diseases exist almost every year. These diseases mostly affect female cows, with the number of them attacked by the diseases in 2019 were 543 cows (Gunungkidul Agriculture and Food Department, 2020). The farmers can suffer a loss of up to 10,000,000 IDR per cow if the mother cow dies. This value is considered large for the cattle farmers if there are deaths in their livestock.

A cattle insurance issued by the government is a risk transfer which can provide compensation for the loss of livestock business so that the sustainability of it can be guaranteed (Indonesian Ministry of Agriculture, 2016). The number of farmers who participate in cattle insurance made by the government apparently is less than the target. For example, in 2016,

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Yogyakarta Province targeted 5,000 cows, but the realization was only 816 cows (Sulaiman, 2018). In Gunungkidul Regency, Yogyakarta Province, the participants were only 315 cows in 2019. This number was still low if it was compared to the number of cows that could be insured, i.e., 87,950 cows (Gunungkidul Agriculture and Food Department, 2019). Thus, this meant that the number of insured cattle was only 0.36%. Farmers do not have enough information about the mechanism behind the insurance scheme; they cannot completely understand whether it will be beneficial for them or not (Binswanger-Mkhize, 2012).

In order to increase the rate of insurance adoption, there also needs to be a better understanding of farmers' interest in joining cattle insurance. The reason for farmers' interest in joining cattle insurance needs to be researched because it can be taken into consideration by the government regarding what matters need to be considered in order to increase the interest of cattle farmers, especially farmers who have not participated in insurance. In addition, it is necessary to know the reasons for cattle farmers who are not interested in insurance which is an obstacle for them not to participate in insurance. This reason can then become material for correction so that it can be improved in disseminating insurance so that the interest of cattle farmers to join insurance increases.

In order to increase the rate of insurance adoption, there also needs to be a better understanding of how much they can afford to pay the premium for insurance (Budhathoki *et al.*, 2019) as well as whether farmers' interest in tenure insurance as assessed by farmers' participation in insurance also affects farmers' willingness to pay insurance. It is suspected that socio-economic factors can influence the farmers' willingness-to-pay (Fahad *et al.*, 2018; Khan *et al.*, 2012; Xiu *et al.*, 2012). In addition, individual decisions on insurance can be influenced by changes in premiums, changes in expected losses,

and changes in the wealth of an individual (Folland *et al.*, 2013).

Willingness to pay which is oriented to a general survey for the quantity or quality of goods or services that used to assess the responses for the component of contingent valuation analysis. CV is one of methods to obtain information about preferences or willingness to pay which is oriented to a general survey. The assessment to the responses is an important component for the contingent valuation analysis because the aim of contingent valuation (CV) is to estimate the individual's willingness to pay for the quantity or quality of goods or services (Haab and McConnel, 2002; Fahad and Wang, 2017). This approach asked the farmers directly about what the maximum value they were willing to pay for the insurance and the benefits they would receive later.

Various literature works have used livestock insurance as a risk management tool for different purposes for several years. The existing literature measured the effect of livestock insurance towards the risk of natural disasters in various countries (Biglari *et al.*, 2019; Gebrekidan *et al.*, 2019; Hänke & Barkmann, 2017; Ye *et al.*, 2017) in practice, few empirical studies have been done on the influence of livestock insurance on the household resilience of livestock herders to climate change. We advanced knowledge in this area by: a. However, scientific studies to determine the farmers' interest and willingness-to-pay for livestock insurance have not been widely conducted. In the developing countries, contingent valuation has become a tool to evaluate index-based insurance schemes' effectiveness in calculating willingness to pay (WTP) (Budhathoki, 2019). Thus, a research on the willingness-to-pay for cattle insurance is still accepted. In addition, studies on cattle insurance have not been carried out in Gunungkidul Regency, Yogyakarta Province, Indonesia, as one of the Indonesian local cattle breeding centers which is Ongole Crossbreed (Gunungkidul Agriculture and Food Department, 2019; Ditjen PKH, 2020;

Sutarno & Setiawan, 2016). This research is expected to provide valuable evidence related to the farmers' willingness-to-pay for cattle insurance and describe its factors. Therefore, the researchers attempt to examine the main factors that influence the farmers' willingness-to-pay (WTP) for cattle insurance as a risk management strategy.

METHODOLOGY

The hilly topography of the area and the high rainfall in Gunungkidul Regency lead to an increase of the number of vectors that carry diseases for cattle (Nururrozi *et al.*, 2017). Playen and Gedangsari Sub-districts are the areas with the largest cattle population in Gunungkidul and have participated in the longest livestock insurance. Hence, these districts were chosen as the objects of the study. The research employed a survey method to obtain primary and secondary data. This study sample involved 100 respondents consisting of two groups: a group of participants in cattle insurance (50 samples) and a group of non-participants (50 samples). In this study, the farmers mentioned were those who worked on the cattle business, either those who had participated in cattle insurance or not. The sample was taken by using a proportional random sampling technique from each group of the selected cattle farmers. The data collected included the number of cows, age, the latest education level, cattle farming experience, the number of family members, livestock income, household income, and risk frequency.

According to Pearce *et al.*, (2006), the preparation of the questionnaire is divided into three parts in which the first part asks a series of questions about attitudes and behaviors toward the products which are to be assessed. Second, contingency scenarios are presented and respondents are asked for monetary evaluation. The last section, there are questions about the socio-economic and demographic characteristics of the respondents. In this study, the questionnaire for respondents' households in the first part asked the

respondents' attitudes and behaviors about cattle insurance such as whether farmers took the cattle insurance or not, completed by the reasons. The second part of the study, the respondents were asked to evaluate cattle insurance products. The last part of the questionnaire, it questioned about the characteristics of cattle farmers.

This study used a Contingent Valuation Method to estimate the farmers' WTP value towards the cattle insurance premium. CV is one of methods to obtain information about preferences or willingness to pay which is oriented to a general survey. The bid value in this study was obtained through direct interviews with the respondents through questionnaires to obtain the maximum value that the respondents wanted to pay for the cattle insurance premium. To obtain the bid value, the researchers used the bidding game technique. This technique was done repeatedly by asking the respondents whether they were willing to pay a certain amount or not. The amount would be increased or decreased depending on whether the respondents were unwilling to pay the previous amount offered or not. The bidding was stopped when the respondents had met the estimated point of willingness to pay. To design the initial bid, some information from the government was used as references. The Indonesian government has set a subsidy of 80% from 200,000 IDR. Hence, the cattle farmers would only pay 40,000 IDR/year.

This study's initial bid value was 40,000 IDR. It was assumed that the government would increase or decrease the subsidy, so the bid value could be higher or lower (table 1). To make things easier, m^1 shows the initial offer; m^{2l} represents the second bid if the individual answers "no" to the first question, and m^{2h} represents the second bid if the individual responds "yes" to the first question. For the individuals who answered 'yes' to the first and 'yes' to the second bid, $m^{2h} \leq WTP < \infty$. For those who answered 'yes' to the first and 'no' to the second bid, $m^{2h} > m^l$, i.e., $m^l < WTP \leq m^{2h}$. For the respondents who

answered 'no' for the first and 'yes' for the second bid, $m^{2i} < m^1$, that is, $m^{2i} \leq WTP < m^1$. Thus, for the individuals who answered 'no' for both first and second bids, $0 < WTP < m^{2i}$ (Budhathoki *et al.*, 2019).

The calculation for WTP's average value is based on the total auction value obtained in the previous stage and divided by the number of respondents. The average WTP value is calculated by using the formula:

$$E \text{ WTP} = \sum_{i=1}^n Wi(Pfi)$$

where: **E WTP** is the alleged average respondents', **WTP (IDR)** is W_i is the i -WTP value (IDR), **Pfi** is the i -relative frequency, **n** is the number of respondents, and **i** represents the respondents ($i = 1, 2, \dots, 45$)

The factors that influence the farmer's WTP value on the cattle insurance premium were analyzed by using multiple linear regression models. The data obtained were then analyzed by using a Natural Logarithm Regression Analysis with SPSS 23 (Statistical Package for Social Science) program. The regression models in this study are:

$$\ln WTP_i = \beta_0 + \beta_1 \ln(COW) + \beta_2 \ln(AGE) + \beta_3 \ln(EDU) + \beta_4 \ln(EXP) + \beta_5 \ln(FAM) + \beta_6 \ln(INCON) + \beta_7 \ln(INCOFF) + \beta_7(D_INTEREST) + \beta_8(D_FREK) + e$$

Where **WTP_i** is the value of the Willingness to Pay (IDR), **COW** is the number of livestock (cow), **AGE** is farmer's age (Years), **EDU** is farmer's last education

level (Years), **EXP** is farmer's cattle farming experience (years), **FAM** is the number of farmer's family members (people), **INCON** is the income from cattle (IDR), **INCOFF** is the household income besides livestock (IDR), **D_INTEREST** is a dummy variable of farmer's interest in insurance with a value of 1 for participating insurance, and 0 for not participating, **D_FREK** is a dummy variable of the frequency of livestock mortality for 1 year with a value of 1 if there is 1 cow death in a year, and 0 if there is no death.

The data were analyzed with the SPSS program and the F statistical test. F statistical test was used to simultaneously determine the factors that influence the farmers' WTP on insurance. Then, the t-statistical was carried out to determine whether each factor influenced the WTP partially.

RESULTS AND DISCUSSION

The Socio-Economic Characteristics of Respondents

The identity of the respondents in this study aims to describe the socio-economic characteristics of the respondents as the samples in this study. The socio-economic characteristics are a description of the condition of individual farmers as well as the condition of the farmer's household in general. Socio-economic factors in this study are the number of cows, age, education, experience, family size, income from livestock, household income, participation, and risk frequency.

Table 1
The Bid Structure of Contingent Valuation to Explore Farmers' Willingness to Pay for Cattle Insurance

Follow up Higher Bid		Follow up Lower Bid	
Bid Value (IDR)	Subsidies (%)	Bid Value (IDR)	Subsidies (%)
200,000	0	35,000	82.5
100,000	50	30,000	85
80,000	60	25,000	87.5
60,000	70	20,000	90
50,000	75	15,000	92.5
45,000	77.5	10,000	95

Source: Primary Data, 2020

Table 2
Socio-economic Characteristics of Respondents

Variable	Definition (unit)	Mean	SD
Dependent variable			
Willingness to Pay	Farmers' willingness to pay for cattle insurance in Indonesian Rupiah (IDR)	29,460.00	12012.97
Independent variable:			
The number of cows	The number of cattle (cows)	2.03	1.087
Age	Age of farmer (years)	56.54	9.819
Education	The education level of farmers (years)	8.09	3.861
Experience	Cattle farming experience (years)	26.57	13.141
Family size	The number of family members	3.69	1.161
Income from livestock	Income from livestock in Indonesian Rupiah (IDR)	12117000.00	11843901.00
Household income	Other incomes in Indonesian Rupiah (IDR)	13397889.00	30690086.99
Participation	Farmers participating in cattle insurance (1=participating, 0=not participating)	0.51	0.502
Risk Frequency	Farmers risk in a year (1= death of 1 cow in a year, 0 = no death)	0.06	0.239

Source: Primary Data, 2020

Table 2, shows the socio-economic characteristics of the respondents. The respondents' ages are divided into two, middle with 30-50 years old (30%) and older with more than 50 years old (70%). The mean of the respondents' ages from table 2 indicates that the participants are in the old age category. The farmers' education levels are divided into four groups: not completing any education level (reading and writing skills), elementary school, junior high school, high school, and university. Table 2 shows most of the respondents graduated from elementary school. As many as 39% of respondents have less than 2-3 family members, 55% with 4-5 people, and 6% with more than five people. The average number of respondents' family members is lower than the national average number of family members, i.e., 3.9 people (BPS, 2020). Mostly, the respondents work as cattle farmers and corn farmers. Thus, the farmers could have additional income. The respondents' household income besides

livestock is 1,009,750 IDR/month, which means that it is still below the national minimum wage, i.e., 2,455,662 IDR (BPS, 2020). So that the average household income of farmers every year is 13,397,889 IDR. This is the reason why the cattle farmers work also as corn farmers.

Meanwhile, most farmers have 1-3 cows (92%) from livestock, and the others have more than three cows. The cattle farmers in this study are working on cattle breeding. Revenue from cattle is calculated from all revenues in the form of sales of male calves, the remaining value of Brood-stock in year seven, plus sales of cattle feces, less production costs, which are the sum of fixed and variable costs. The total income obtained by respondents is calculated for seven years according to the productive age of the Brood-stock, which is then averaged for each year. The results showed that the average income of farmers per year was 12,117,000 IDR. As many as 35% of farmers have more than

20 years of cattle farming experience, 53% with 20 to 40 years, and 12% with more than 40 years.

As many as 64% of 50 respondents who participated in livestock insurance stated the risk of death of livestock as their intention to buy livestock insurance, and 22% of farmers stated that they follow other farmers. Other farmers claim that livestock insurance provides them a sense of security (14%). As many as 50 respondents did not participate in cattle insurance. Those who refused to mention the reasons: they feel they do not need insurance (42%), this is because the farmer thinks that his cow will not die. Other reasons farmers refused cattle insurance are: the insurance payments are too expensive (27%), and they do not have enough money (20%). Only 7% cited the administrative complexity of cattle insurance as an excuse. The rest stated that they lacked knowledge about livestock insurance.

An Overview of Livestock Insurance in Indonesia

Since 2016, the government has implemented insurance for cattle farmers in Indonesia. The participants of cattle insurance are those who do a cattle breeding business. Cows that can take insurance are one-year-old female cows who are still productive and in healthy condition. Cattle insurance premium is the product of the premium rate and the sum insured. The latter is the value of the cow which is determined based on the acquisition cost or the estimated selling price by the insured and approved by the insurer as the maximum value of compensation in which the agreed insurance price is 10,000,000.00 IDR/cow. The insurance premium rate is set at 2%, so that the premium which is set at 2% of the sum insured is 200,000 IDR per cow per year. The amount of the cattle insurance premium subsidy from the government is 80% or 160,000 IDR/cow per year and the rest is paid independently by the cattle farmers at 20% or 40,000 IDR/cow/year (Ditjen PSP, 2020).

Analysis of Willingness to Pay for Cattle Insurance

The initial bid value starts from 40,000 IDR as the premium payment requirement. Based on the research findings, 40% of farmers who participate in cattle insurance are willing to pay 40,000 IDR. Meanwhile, 92% of farmers who do not participate in cattle insurance are willing to pay less than 40,000 IDR. There was 50% willing to pay 40,000-60,000 IDR, with the highest value of 60,000 IDR and the lowest value of 10,000 IDR. The average willingness to pay by farmers who participate in insurance is 36,320 IDR, which means that the government's subsidy is 81.8%.

The farmers who do not participate in cattle insurance are willing to pay a premium of 10,000-40,000 IDR (94%). The highest value of willingness to pay in this group is 50,000 IDR, and the lowest is 10,000 IDR. The average WTP of farmers who do not participate in insurance is 22,600 IDR, which means that the government's subsidy is 88.7%; more than farmers who take insurance. For five years, no cow deaths had been reported from these 50 respondents. Therefore, paying 40,000 IDR for insurance is still considered costly for them.

The willingness to pay for insurance found in this study shows that the average value of WTP farmers participating in insurance are higher than those who do not. However, the WTP of farmers who take insurance and farmers who do not participate in insurance is still below the actual premium, which is IDR 40,000 with a subsidy of 80%. These results are consistent with (Jensen & Barrett, 2017), where subsidies alone are unlikely to be an effective tool for generating a large proportion of the insured population unless subsidies are extremely high. This is contrary to (Budhathoki *et al.*, 2019), which observed that crop farmers in Nepal, were willing to pay insurance three times higher than the prevailing premium. It means that farmers are willing to pay higher for insurance even though agriculture income will be less due to the spending.

Table 3
Regression Analysis Result

Variables	Coefficient Regression	Estimate Coefficient		
		Standard Error	t-statistic	p-value
Constant	11.675	1.258	9.281	0.000
<i>Independent:</i>				
Ln_COW	0.125	0.078	1.609	0.111
Ln_AGE	-0.823	0.224	-3.678	0.000***
Ln_EDU	0.306	0.108	2.840	0.006***
Ln_EXP	0.008	0.059	0.140	0.889
Ln_FAM	-0.185	0.108	-1.711	0.091*
Ln_INCON	-0.023	0.031	-0.730	0.467
Ln_INCOFF	0.094	0.044	2.154	0.034**
D_PART	0.370	0.068	5.434	0.000***
D_FREK	-0.065	0.145	-0.452	0.652
R ²	= 0.509			
Adjusted R ²	= 0.454			
F-statistic	= 9.322***			

Note: ***= Significant at $\alpha = 1\%$; **= Significant at $\alpha = 5\%$, *= Significant at $\alpha = 10\%$

Source: Primary Data, 2020

Determinant Factors of Willingness to Pay for Cattle Insurance

This study used 9 independent variables categorized into different groups, as shown in Table 3. The tool for data analysis is SPSS 23.0 software. After analyzing the data, the results of multiple linear regression analysis are obtained as shown in Table 3.

Several factors that influence the farmers' WTP on cattle insurance significantly include age, number of families, non-livestock income, and participation in cattle insurance. Age has a negative relationship with the willingness to pay for cattle insurance (-0.823) and highly significant (p-value of 0.000); it indicates that young farmers are more willing to pay higher insurance than older farmers, this result support previous research Oduniyi *et al.*, (2020). Older farmers being hesitant and slow in adopting new programs, resulting in their reluctance to pay for insurance, this is also confirmed by (Kakumanu *et al.*, 2012; Sadati *et al.*, 2010). However, our results are contrary to those of Chand *et al.* (2016) and Okoffo

et al. (2016), who found older farmers are more willing to adopt crop insurance than younger farmers. Cattle farmers in Gunungkidul Regency who are older feel they do not really need insurance and feel that the process of registering and claiming insurance is complicated for them. Older farmers tend to choose something that they feel is less difficult for them.

Education is highly significant (p-value of 0.006) and has a positive relationship with the willingness to pay for cattle insurance (0.306). This means that as education increases, the willingness to pay for cattle insurance is higher, in line with Khan *et al.* (2012), research. Higher educated farmers have the ability to manage very well and carry out various risk management practices such as being involved in insurance. Farmers' education level can improve farmers' ability to understand and accept the new innovations presented to them, including innovations in farm risk management with agricultural insurance. However, the results of this study are not in accordance with previous research, Kwadz *et al.* (2013), who reported a negative

relationship between education and farmers' willingness to use insurance. This is because cattle farmers in Gunungkidul Regency who have higher education can make decisions more openly, rationally so that they are able to analyze the benefits of new innovations.

There is a negative relationship between family size and willingness to pay for cattle insurance (-0.185) and significant at a p-value of 0.091, indicating that households with large families are less willing to pay for cattle insurance than farmers with small families. A household head with more dependents is less likely to insure their livestock because he has more responsibilities to look after and prefers not to divert resources to purchase insurance. These results support the previous research of Budhathoki *et al.*, (2019); Fahad *et al.*, (2018); Oduniyi *et al.*, (2020). The number of family dependents of the farmer influences the farmer's decision to run a cattle business. This result is contrary to Arshad *et al.*, (2016); Chand *et al.*, (2016). This is because the greater the number of family members, the greater the living burden that must be fulfilled so that there is less willingness to pay for insurance.

The household income beside livestock shows a positive correlation with the willingness to pay for cattle insurance (0.094) and significant with a p-value of 0.034, meaning that the higher the farmer's income from corn farming or others, the higher the willingness to pay for cattle insurance. This result is in line with Abebe & Bogale, (2014); Ali, (2013); Ellis, (2017). Farmers who have low income may not be able to afford insurance with high value and prefer to secure their welfare. However, this is not in line with findings by Fahad *et al.*, (2018) and Budhathoki *et al.*, (2019); the more household income, the lower the premiums willing to be paid by farmers. This is because cattle farmers in Gunungkidul Regency who have income from outside livestock means that their household income increases so that

farmers can increase their expenses for insurance.

The farmer's interest is highly significant (p-value of 0.000) with a positive relationship with the willingness to pay for cattle insurance (0.370). This means that farmers who have participated in cattle insurance have a higher willingness to pay than farmers who have not. This is also indicated by the higher average value of farmers who participate in insurance than that of farmers who do not. This is because farmers who have followed insurance have better perception than farmers who have not followed insurance. Farmers who take insurance have experienced the convenience and benefits of insurance so that the willingness to pay for insurance is higher. This result is supported by the research of Chand *et al.*, (2016) and Cortner *et al.*, (2019), but contradicts the research of Khan *et al.*, (2012) and Ali, (2013).

The number of cattle owned by farmers has a positive (0.125) but was insignificant (p-value of 0.111), meaning that the number of cattle owned by breeders has no effect on willingness to pay cattle insurance. The results of the study are not in line with Xiu *et al.*, (2012) and Chand *et al.* (2016), which shows that the number of cows has a negative effect on the farmer's WTP. This is because farmers feel that the frequency of risks that occur tends to be the same even though the number of livestock owned is more so that it does not affect the willingness of farmers to pay the cattle insurance premium as a risk strategy.

Livestock experience has a positive coefficient (0.008) but not significant (p-value 0.889) which means that the farmer's experience in raising cattle has no effect on willingness to pay for cattle insurance. In line with the research of Xiu *et al.*, (2012), that experience does not affect farmers' willingness to pay. This is because farmers feel that the frequency of risks that occur tends to be the same even though the experience of farmers in raising cattle is longer so it does not affect

the willingness of farmers to pay the cattle insurance premium as a risk strategy.

Meanwhile, income from cattle has a negative coefficient (-0.023) but not significant (p-value 0.467), indicating that the amount of income received by farmers from the cattle business has no effect on the willingness of farmers to pay cattle insurance. In line with the research of Chand *et al.* (2016), where income from livestock has no effect on willingness to pay for insurance. This is because farmers tend to allocate their income for production costs rather than insurance.

The risk frequency variable has a negative coefficient (-0.065) but not significant (p-value 0.652). This means that the number of livestock deaths has no effect on the willingness to pay for insurance. This result is not in line with Fahad *et al.* (2018), where a lower frequency of disasters affects farmers' willingness to pay. This is because the number of livestock deaths experienced by respondents is not large so that it does not provide large losses continuously. The average number of deaths experienced by respondents for 5 years is almost the same, namely as many as 0 to 1 head. So that it does not cause a significant effect on the willingness to pay for cattle insurance.

CONCLUSION

The willingness to pay by farmers who do not participate in cattle insurance is lower than those who do. The average WTP of the respondents is lower than the government stipulation (40,000 IDR) with values of 22,600 IDR and 36,320 IDR, respectively. Cattle farmers who participated in livestock insurance stated the reason they participated in cattle insurance is the risk of death of livestock, follow other farmers, and livestock insurance provides them a sense of security. Respondents who did not participate in livestock insurance mention three main reasons, there are they feel they do not need insurance, the insurance payments are too expensive, and they do not have enough money. There were five factors that have significant effects on the

willingness to pay for livestock insurance. Education, household income, and farmers' interest have positive effects on the farmers' willingness to pay. Meanwhile, age and the number of families have negative effects on the farmer's willingness to pay. Willingness to pay cattle insurance premiums to farmers participating in cattle insurance is higher than non-participating cattle insurance, so the government continues to target them to participate in the cattle insurance program again and can be involved in socializing cattle insurance. The government can target farmers who have income outside the cattle business, because the income of farmers is higher than the premium so they have the ability to pay for cattle insurance. In addition, the government can also target farmers with fewer family dependents, because they are willing to pay higher cattle insurance premiums.

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