AGRO EKONOMI, Vol 32, Issue 1, June 2021, Page.52-61
DOI : http://doi.org/10.22146/ae.591756
ISSN 0215-8787 (print), ISSN 2541-1616 (online)
Available at https://jurnal.ugm.ac.id/jae/

Farmers' Willingness to Pay for Livestock InsurancePrograms in Kulon Progo District

Tri Kurniaty.[1], Masyhuri[2], Jamhari[3]
[1]Student of Postgraduate, Universitas Gadjah Mada
[2,3] Department of Agricultural Socioeconomics, Faculty of Agriculture, Universitas Gadjah Mada
Jalan Flora, Bulaksumur, Depok, Sleman, Daerah Istimewa Yogyakarta
Trikurniaty@mail.ugm.ac.id

Submitted : 29 August 2020 ; Revised : 14 February 2021 ; Accepted : 31 Mei 2021

ABSTRACT
Livestock Insurance is one of the insurance products that is supported by the government with PT Jasindo as the organizer. Livestock insurance will provide the potential for cattle ranchers who can attain risky threats such as cattle deaths due to illness, accidents, losses and deaths. This study aims to determine the value of the willingness of farmers to pay the insurance and the factors affecting the willingness of farmers to pay the insurance. This research was conducted from February to March 2020 in Kulon Progo district. Location determination was done by purposive sampling based on data from the farmer following the insurance program. Primary data obtained from 53 farmers with the help of a questionnaire and analyzed by the method of contingency value (CVM) and multiple linear regression. The research shows the average value of willingness to pay insurance was IDR45,660 per head per year above the value of the insurance premium assessment. Factors that significantly influence a Farmer's Willingness to Pay (WTP) for the Insurance program are the variable number of family dependents and income, while the age, duration of raising, and education have no significant effect. Based on the value of the EWTP obtained, which was very low, the expectation of farmers is not to demand a low price.

Keywords: Contingent Valuation Method, Livestock Insurance, Willingness to Pay

How to cite : Kurniaty, T., Masyhuri and Jamhari. 2021. Farmers' Willingness to Pay for Livestock Insurance Programs in Kulon Progo District. Agro Ekonomi 32(1), 52-61

INTRODUCTION

Agricultural insurance is an agreement between a farmer and an insurance company to commit themselves to the risk coverage of farming, especially food crops, horticulture, plantations, and/or livestock (Ministry of Agriculture, 2018). (Swatika Dewa K.S et al., n.d.) state that cattle farming in Indonesia is generally a small-scale rural family business, whereas large-scale business is still very limited and is generally a growing cattle business.

Livestock farming has a variety of risk of cattle death due to accidents, natural disasters including disease outbreaks, in this regard, according to Law No.19 of 2013 concerning the

protection and empowerment of farmers and Minister of Agriculture Regulation No. 40/Permentan/SR.230/7/2015 concerning facilitation of agricultural insurance, so agricultural insurance is needed. To achieve this goal, the livestock sub-sector puts one of its main priorities in developing the cattle business.

In agricultural insurance, several factors influence the attitude of farmers to join and pay premiums. Significant influencing factors include farmers' income, farm size, land ownership, education level, age of the head of the family, the amount of savings, and access to information. (Amin et al., 2014; Enjolras et al., 2012; Falola et al., 2013; Kumar, 2013; Sadati et al., 2010); Falola 2012, Enjorlas et al. 2012, Kumar 2013, Aido 2014, Abulhasan et al. al. 2010). According to (Danso-Abbeam et al., 2014) the willingness of farmers to pay premiums is significantly influenced by marital status, educational attainment, ownership of agricultural land for agriculture, farmers' awareness of insurance. (Sai et al., 2010) explored several important factors influencing farmers using or not using agricultural insurance and provided some advice to develop agricultural insurance in China to make decisions.

Willingness to Pay (WTP) is a form of economic assessment which is carried out by looking at the willingness to pay off the farmers to deal with the risk of failure from child farming activities. The demand for insurance in Kulon Progo district is increasing, the willingness to pay is considered important to determine the amount of premium that farmers are willing to pay for insurance if the government changes policies related to insurance premiums or does not provide subsidies for insurance premiums. This study is intriguing to discuss because there is no research on the willingness of farmers to pay livestock insurance premiums, especially in Kulon Progo district.

METHODS

Site selection in this study was determined by a purposive sampling technique, which is a sampling technique with consideration and specific objectives from the researcher (Sugiyono., 2015). The research was conducted from February to March 2020 in Kulon Progo District. The proportional random sampling was used as the sampling method. There were 53 people taken as samples of this study. The number of samples in each district was proportionally calculated. The contingency value (CVM) method and multiple linear regression were used as the method of analysis of this study.

Building a Hypothetical Market

The hypothetical market illustrates an event if there is a change in the environment in the future. This research illustrates the importance of breeders using insurance for their livestock because the increasing concern of farmers to protect livestock.

Generating Bid Value (Bid)

Obtaining the Auction Value (Bid) was obtained through a survey conducted directly with a questionnaire and interviews done by the researchers. Respondents were asked questions again about whether they were willing to pay the predetermined premium.

Calculating the average WTP

Calculating the average WTP was done after carrying out the survey and obtaining the auction value. The next step was to calculate the average WTP value of each respondent. This calculation was based on the mean (mean) and middle (median) values. At this stage, there should be a lot of possibility of the emergence of values that are very far from the average (outliner). The average was calculated by using the following equation:

$$EWTP = \sum_{i=1}^{n} Wi\ (fi)$$

where :

EWTP = Alleged the average WTP of respondents

Wi = i WTP value (IDR)

fi = Relative frequency WTP of respondents-i

n = Number of respondents

i = i-respondent who is willing pay (I = 1,2,3,,,,,n)

Estimating the Bid Value Curve

Estimating the respondent's WTP curve was acquired by using the cumulative number of each WTP value chosen by each respondent. It was assumed that each individual who is willing to pay a certain amount of WTP is gaining less or more in line with the value of WTP. Estimating the bid value curve was obtained by aggregating the value of WTP with the independent variables with the equation:

$$WTP = f\ (X1 \ldots . X6)$$

where :

WTP = Value of WTP respondent

X_1-X_6 = Independent Variable (age, education, duration of farming, number of family dependents, income).

Aggregating WTP

Aggregating data was obtained at the third stage. This process involved converting sample average data to the overall population average. One way to convert this was by multiplying the sample average by the population. WTP calculation used the following equation:

$$TWTP = EWTP \times POP$$

where :

TWTP = Total value of WTP (Rp)

EWTP = Estimated value of the average WTP of respondent

Evaluation

Evaluation was used to determine the extent to which the price paid by farmers was following the received benefits. Factors affecting the WTP program are analyzed by using multiple linear regression with the following contributions:

Ln Y = 4.930 - 0.248 Ln Age + 0.016 Ln Duration Of Farming + 0.050 Education – 0.326 Ln Number of Familiy dependants + 0.475 Ln Income + e

where :

Y = WTP Insurance (rupiah)

b0 = Regression constant

b0-5 = regression coefficient of age, duration of raising, education, number of family dependents, income.

X1 = Farmer's age (years)

X2 = length of farming (years)

X3 = Education (year)

X4 = Number of family dependants (people)

X5 = Revenue (Rp / month)

RESULTS AND DISCUSSION

The respondents of this study were farmers joining the livestock insurance program in Kulon Progo district. Based on the results of this study, it can be known that the age of farmers in this study was at an average level, at the productive age of 50 years, which was 62.26%. Most respondents were male (98.11%). In this study, the majority of farmers had a long experience of raising livestock; 1 - 20 years (71.70%). At the level of education, 47.17% farmers (majority) graduated from high schools. The family income ranged from IDR1,000,000 to IDR 2,000,000 with a percentage of 48.08%. The majority of respondents were married and had an average of dependants of 1-2 people, which was as many as 49.06%. (Kwadzo et al., 2013) said that the number of family dependents can increase WTP because the greater the number of families, the higher the possibility of being dependent on agriculture. The responsibility to decrease potential losses becomes higher.

Analysis of Willingness to Pay

The contingent valuation method (CVM) was used to analyze the willingness to pay for livestock insurance in Kulon Progo district. CVM was used to determine how far farmers can pay livestock insurance premiums. The results of the survey revealed that the majority of respondents were willing to pay insurance premiums, according

to the government agreement of < IDR40,000 at 7.54%, willing to pay ≥ IDR40,000 for a while 92.45%.

The Hypothetical Market

In the hypothetical market, researchers described that farmers need to join a livestock insurance program. This was explained to the farmers to make farmers realize that their willingness to keep paying for the insurance a premium is a guarantor of the risk of breeding failure. All respondents agreed with the insurance program as a protector and guarantor in case a failure occurred. Although at the beginning taking part in this program was an obligation for farmers who receive cow breeders' assistance from the government, farmers were also willing to pay the predetermined premiums by using their funds.

WTP value

After knowing the farmer's willingness to pay the AUTS premium, the next step was to know the amount of the auction value (Bid). The WTP value offered is determined based on the percentage of premiums, starting from the lowest of 10% to the highest of 100% of IDR200,000. Based on the research, the ability of farmers to pay insurance premiums; 4 respondents were willing to pay a premium of <IDR40,000, 49 respondents were willing to pay a premium of ≥ IDR40,000 (Tabel 1.)

The Average value of WTP

The average value of farmers' Willingness to Pay (EWTP) was calculated based on the data distribution. The average value of Willingness to Pay (EWTP) for livestock insurance in Kulon Progo district was IDR45,660 per head per year. The average value of farmers' WTP for insurance premiums if the government no longer provides subsidies to the insurance program was IDR45,660 or 22.83% of the total premium, which was IDR200,000. Based on the field work result, farmers still needed subsidies from the government, of course; the WTP value given by the respondent was related to the low desire of respondents in risk management and the low concern of respondents in protecting their livestock.

Curve of WTP

The WTP curve was formed by using the cumulative sum of the WTP values given by the respondent. It can be seen from the curve line in (Figure 2) which represents the respondent's demand for willingness to pay in the AUTS program that the WTP demand curve has a negative slope which means the higher the WTP value determined, the fewer respondents were willing to pay the AUTS premium.

Aggregate Data

The aggregation value of WTP was a value of the entire population in Kulon Progo district. Based on the results of the study the total population in Kulon Progo district in 2019 was 447,246 people, then the total aggregation results were IDR20,421,252,360. The value of aggregation has a potential value that can be developed for the average value of WTP for livestock insurance in Kulon Progo district.

Analysis of Factors Affecting WTP in Kulon Progo District

Factors affecting the amount of WTP value can be determined by using multiple linear regression statistical tests. The analysis used 5 independent variables that were assumed to influence the dependent variable (WTP value) namely age, length of farming, education, number of family dependents, and income. The model is said to be valid when it passes the model determination test (R2 test, F, test, t-test) and the classical assumption test (normality, multicollinearity, and heteroscedasticity).

The model in this study had an R^2 value of 0.338, meaning that the variation of the dependent variable (WTP) was explained by the independent variables (age, length of ranching, education, number of family dependents, and income) by 33.8%, and as many as 66.2% explained by variables outside the model. The adjusted R2 value of 0.267 or 26.7% (Tabel 2). From the model above, a constant value of 4.930 can be seen with the meaning that the age, length of raising, education, number of family dependents, and income equal to zero (0) then the WTP variable will be positive at 4.930. From the results of the multiple linear regression analysis, several factors influenced the value of WTP, namely the variable number of families and income variables having a significant effect on the level of 1%, and variables of age, length of raising, and education does not significantly influence the value of WTP.

Table 1. Percentage of Willingness to Pay for livestock insurance

WTP (Rp)	Frequency	Percentage (%)
< 40,000 IDR	4	7.54
≥ 40,000 IDR	49	92.45
Total	53	100.00

Source: Primary Data (2020)

The coefficient of the number of family dependants is negative 0.326. It indicates that there was a negative relationship between the number of family dependants and the WTP variable. If the number of family dependants increases by one person, the WTP variable will decrease by IDR0.326.

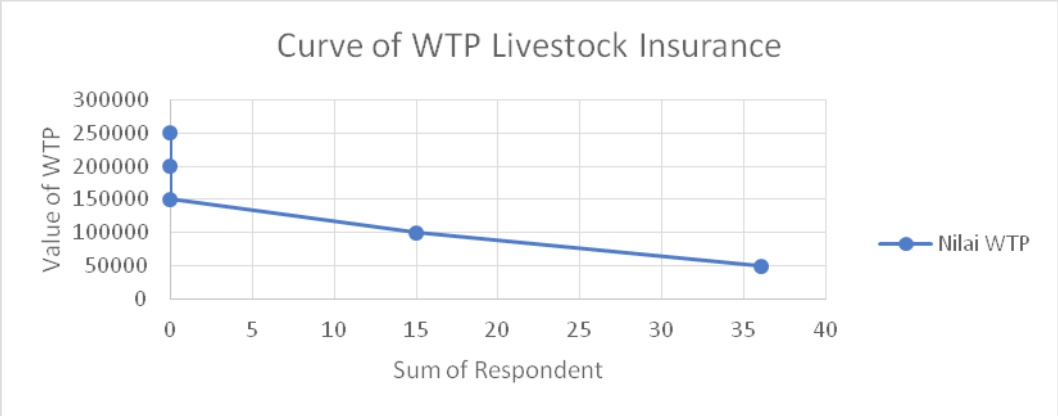

Figure 2. Curve of Number of family dependents

Table 2. Analysis of Factors Affecting WTP in Kulon Progo District

Ln Y (WTP AUTS)	Coefficient of Regression	t-Count	Value p	VIF
Constant	4.930**	2.404	0.020	
Ln Age	-248^{ns}	-911	0.367	1.677
Ln Duration of Raising	0.016 ^{ns}	1.228	0.225	1.093
Education	0.050 ^{ns}	0.650	0.519	1.725
Ln Number of family dependents	-326***	-3.426	0.001	1.210
Ln Income	0.475***	3.621	0.001	1.363
F-Count	4.793			
R^2	0.338			
Adjusted R2	0.267			
Durbin Watson	1.764			
Note				
*) sig α = 10 %				
**) sig α = 5 %				
***) sig α = 1 %				

Source: Primary Data (2020)

Therefore, the greater the number of family dependents, the smaller the farmers' WTP value for AUTS will be. The variable number of family dependants has a significant effect on insurance WTP. It is also supported by (Kwadzo et al., 2013) stating that the number of family dependents can affect WTP because the greater the number of families, the more the family will depend on agriculture, and the responsibility to reduce potential losses will also be higher.

Income

The coefficient of the income variable had a positive sign of 0.475.

It indicates a positive relationship between the income variable and the WTP variable. If the income variable increases by one rupiah, the WTP variable will increase by IDR0.475. The income variable had a significant effect on insurance WTP. (Putra, 2019) said in his research that the income variable is a variable that affects the ATUP program. The same thing was also expressed by (Annisa & Harini, 2017) that the income of visitors has a positive effect on the value of WTP.

CONCLUSION AND SUGGESTION

The results show that the average WTP (EWTP) value of 53 respondents who were willing to pay for the insurance program was IDR 45,660 per head per year. It indicates a surplus of Rp. 5,660 per head per year, this margin provides an opportunity for insurance to remain consistent. The factors that have a significant effect on the Willingness of Farmers to Pay (WTP) to the insurance program are the variables of the number of family dependents and income, while age, length of raising, and education do not have a significant effect. According to this study, findings recommended that firstly, extension courses increase the amount of farmers awareness about premium of insurance, it is hoped that farmers will not demand too low a price. Further studies on the strategic roles and functions of farmer groups need to be carried out in the implementation of livestock insurance.

REFERENCES

Amin, M. A., Abdullahi, G. A., Suryani, D., & Alias, R. (2014). Farmer's Willingness to Pay for Crop Insurance in Northwest Selangor Integrated Agricultural Development Area (IADA), Malaysia. *Journal of ISSAAS (International Society for Southeast Asian Agricultural Sciences)*, *20*(2), 19–30.

Annisa, T. M., & Harini, R. (2017). Analisis Kesediaan Membayar (WTP) untuk Mendukung Ekowisata Berkelanjutan di Kawasan Wisata Gua Pindul, Kabupaten Gunungkidul. *Jurnal Bumi Indonesia*, *6*(4), 228867.

Cao, Y., & Zhang, Y. (2011). *Hog insurance adoption and suppliers' discrimination: A bivariate probit model with partial observability*.

Danso-Abbeam, G., Addai, K. N., & Ehiakpor, D. (2014). Willingness to Pay for Farm Insurance by Smallholder Cocoa Farmers in Ghana. *Journal of Social Science for Policy Implications*, *2*(1), 163–183.

Enjolras, G., Capitanio, F., & Adinolfi, F. (2012). The Demand for Crop Insurance: Combined Approaches for France and Italy. *Agricultural Economics Review*, *13*(389-2016–23488), 5–22.

Falola, A., Ayinde, O. E., & Agboola, B. O. (2013). Willingness to Take Agricultural Insurance by Cocoa Farmers in Nigeria. *International Journal of Food and Agricultural Economics (IJFAEC)*, *1*(1128-2016–92004), 97–107.

Han, F., Yang, Z., Wang, H., & Xu, X. (2011). Estimating Willingness to Pay for Environment Conservation: A Contingent Valuation Study of Kanas Nature Reserve, Xinjiang, China. *Environmental Monitoring and Assessment*, *180*(1–4), 451–459.

Kumar, R. (2013). Crop Insurance-Tribulations and Prospects of Farmers Concerning Nuzvid, Krishna District. *International Journal of Marketing, Financial Services & Management Research-ISSN*, 2277–3622.

Kwadzo, G. T. M., Kuwornu, J. K. M., & Amadu, I. S. B. (2013). Food Crop Farmers' Willingness to Participate in Market-Based Crop Insurance Scheme: Evidence from Ghana. *Research in Applied Economics*, *5*(1), 1.

Makatita, J. (2013). Hubungan Antara Karakteristik Peternak dengan Skala Usaha Pada Usaha Peternakan Kambing di Kecamatan Leihitu Kabupaten Maluku Tengah. *Agrinimal*, *3*(2), 78–83.

Ministry of Agriculture, D. P. P. D. J. P. dan S. (2018). *Pedoman Bantuan Premi Asuransi Usaha Ternak Sapi/ Kerbau*. 283–312.

Putra, B. E. (2019). *Strategi Peningkatan Keikutsertaan Petani Pada Asuransi Usaha Tani Padi (AUTP) di Daerah Sentra Pertanian Padi Kabupaten Cianjur*.

Ramdas, M., & Mohamed, B. (2014). Impacts of Tourism on Environmental Attributes, Environmental Literacy, and Willingness to Pay: A Conceptual and Theoretical Review. *Procedia-Social and Behavioral Sciences*, *144*, 378–391.

Sadati, S. A., Ghobadi, F. R., Sadati, S. A., Mohamadi, Y., Sharifi, O., & Asakereh, A. (2010). Survey of effective factors on the adoption of crop insurance among farmers:

A case study of Behbahan County. *African Journal of Agricultural Research*, *5*(16), 2237–2242.

Sai, T., Yulian, W., & Xiaofeng, H. (2010). An Empirical Study of Agricultural Insurance—Evidence from China. *Agriculture and Agricultural Science Procedia*, *1*, 62–66.

Singh, A. S., & Hlophe, N. M. (2017). Factors Affecting Adoption of Livestock Insurance : A Case Study of Livestock Farmers in Manzini Region, Swaziland. *Research Journal of Agriculture and Forestry Sciences*, *5*(8), 6–14.

Sugiyono. (2015). *Metode Penelitian Pendekatan Kuantitatif, Kualitatif, dan R&D.* Alfabeta, Bandung.

Swatika Dewa K.S, Kumar, R., Manikmas, M. O. A., Sayaka, B., Kariyasa, K., Villa, L. M. M. De, Decena, F. L. C., & Concepcion, R. N. (n.d.). UNESCAP-CAPSA CAPSA Working Papers currently available : *Training*.