

PAPER • OPEN ACCESS

## Farmers' knowledge, perceptions, and participation on the implementation of crop insurance program in Aceh Besar

To cite this article: Z Fadhlani *et al* 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **273** 012062

View the [article online](#) for updates and enhancements.

# Farmers' knowledge, perceptions, and participation on the implementation of crop insurance program in Aceh Besar

Z Fadhliani<sup>1,2</sup>, E Yustika<sup>1</sup>, A Nugroho<sup>1,2</sup> and A H Hamid<sup>1</sup>

<sup>1</sup> Departement of Agribusiness, Syiah Kuala University, Kopelma Darussalam, Banda Aceh, Indonesia

<sup>2</sup> Tsunami Disaster Mitigation and Research Center (TDMRC), Syiah Kuala University, Jl. Prof. Dr. Ibrahim Hasan, Gampong Pie, Banda Aceh, Indonesia

**Abstract.** The evaluation toward the implementation of crop insurance in Indonesia have been received relatively little attention. This study analyzes knowledge, perception and participation of farmers toward the implementation of the crop insurance program (AUTP) by using data from 80 subjects in Suka Makmur Subdistrict in the Regency of Aceh Besar. Utilizing a questionnaire, we display farmers' knowledge, perception, and participation reported based on frequencies. One-way ANOVA tests with the associated post-hoc tests, is performed to examine significant differences among means of knowledge, perception and participation levels with the independent variables being age, gender, education, household income, rice field area, and land ownership. The results indicate that only less than half of farmers have overall good knowledge, despite their participation in AUTP. Most of subjects respond relatively low level of participation toward AUTP. Knowledge, perception and participation levels are varied significantly based on the independent variables, but gender. In general, this study has shown farmers' low level of knowledge, perception and participation toward the implementation of AUTP crop insurance which can significantly affect the sustainability of the crop insurance program. Therefore, emphasis on the program to boost the level of knowledge, perception and participation of the farmers is needed.

## 1. Introduction

Crop insurance has been widely use in high-income country for decades. In Indonesia, crop insurance is just recently introduced covering limited regions. The Ministry of Agriculture has developed the pilot Asuransi Usaha Tani Padi (AUTP) insurance program as part of mitigation efforts in response to global climate change [1]. AUTP is an indemnity based crop insurance given to a group of farmers (kelompok tani/Poktan), where 80 % of the premium cost is subsidized by the government (farmers required to pay 20% of total premium cost). The first pilot Asuransi Usaha Tani Padi (AUTP) or rice insurance program was implemented in East Java Province and South Sumatra Province in the planting season of 2012-2013 [2]. In Aceh Province, the pilot project is administered since 2015 covering five regencies including the regency of Aceh Besar.



Although years of pilot programs and billions of expenditures in government subsidies, the evaluation toward the implementation of crop insurance in Indonesia have been received relatively little attention. Measuring farmers' behavior toward the program is necessary to observe the progress. Therefore, assessing farmers' knowledge, perception and participation of the implementation of the rice insurance program in Indonesia will be valuable to improve its effectiveness and benefits to farmers.

Past studies on crop insurance in Indonesia narrowly focused on the possibility of implementing a weather index insurance [2,3], while very few studies have analyzed knowledge, perception and participation of farmers on crop insurance program (AOTP). We also examine significant differences among means of knowledge, perception and participation levels with age, gender, education, household income, rice field area, and land ownership since voluminous literature on crop insurance [4-6] indicates that such variables is believed to be related to crop insurance knowledge, perception and participation.

## **2. Methodology**

### *2.1. Population and sample*

The present study is performed in Suka Makmur Subdistrict in the Regency of Aceh Besar. Out of twelve subdistricts in the Aceh Besar Regency, the subdistrict of Suka Makmur has the greatest number of farmers who are joining the government-subsidized crop insurance program that is introduced since 2015 in Aceh Province. The target population in this study is rice farmers joining Rice Insurance program in 2017 (400 farmers). A sample of 80 farmers was interviewed for this study during August 2017 using a questionnaire.

### *2.2. Instrument*

The questionnaire used in the survey consisted of 4 sections. Section one covers the questions investigating the socioeconomic and demographic information of the household such as age, education, and farming experience of the household. Section two places the questions about farmers' knowledge of AOTP crop insurance program in the study area. Section three covers the questions exploring farmers' perception of AOTP crop insurance program. In sections four, respondents are asked about crop insurance experiences regarding their participation on AOTP crop insurance program in the study area.

### *2.3. Data Analysis*

The data obtained from the questionnaires are numerically scored and statistically analyzed using the Statistical Package for Social Sciences (SPSS v. 23). To determine the knowledge, perception and participation of the respondents, total scores are obtained by summing the scores of all questions within each of the sections. The total scores for each section varied for the section on knowledge, responses to statements (n=8) are scored as follows: yes = 1 and no = 0, and the scores are combined to give a score range of 8-16. For the section on perception, responses to statements (n=8) are scored as follows: agree = 3, neutral = 2, disagree = 1, and the scores are combined to give a score range of 8-24. For the section on participation, responses to statements (n = 9) are scored variably depends on the statements ordered from highest (3) to lowest (1), and the scores are combined to give a score range of 9 to 27.

Results regarding knowledge, perception, and participation are reported based on frequencies. One-way ANOVA tests with the associated post-hoc tests, assuming unequal variances, are also performed to examine significant differences among means of knowledge, perception and participation levels with the independent variables being age, gender, education, household income, rice field area, and land ownership.

### 3. Results and discussion

#### 3.1. Characteristics of respondents

Descriptive statistics of the sample are presented in Table 1. The majority of farmers are female and most farmers reported to be in the age group of 40-59 years. Only few farmers earned a degree and most of them attain primary or secondary education. This situation may affect farmers' knowledge, perception, and participation regarding crop insurance since education has been marked as one expedient indicator to measure farmers' ability in using sophisticated financial insurance tools [5,7].

Farmers in the study area engage in agriculture as their main livelihood. Around 56% of farmers earn between Rp. 1.000.000 – Rp 2.000.000 monthly. These households also work in very small farms with some of them cultivate in the area of 0.5 hectare and above. Moreover, most of the respondents are tenant farmers.

**Table 1.** Characteristics of respondents

Variable	Scale	Percentage (%)
Age	less than 40	29%
	40 to 59	65%
	60 or above	6%
Gender	Male	24%
	Female	76%
Education	Elementary	28%
	Middle	25%
	High	34%
	College or university	14%
Income	less than 1 million rupiah	39%
	1 million to 2 million rupiah	56%
	more than 2 million rupiah	5%
Area of rice field	<0.5	48%
	≥0.5	53%
Land ownership	Self-owned	40%
	Rent/yield share	60%

#### 3.2. Farmers' knowledge about AUTF program

Overall level of knowledge mean frequencies (Table 2) suggests that only less than half of farmers (49.5%) have good knowledge, despite their participation in AUTF rice insurance program. Farmers' best knowledge is regarding to, "the advantage of joining AUTF crop insurance program", "the amount of premium paid by farmers", "the amount of sum insured per Ha, "the term of insurance given", and "the aim of AUTF that is to compensate crop lost because of flood, drought, pest and diseases. However, when the question is changed to whether they know or not that the aim of AUTF is to protect farmers from the risk of flood, drought, and pest and diseases, the majority of farmers show little knowledge (6.3% opt for

yes), indicating that farmers still confused and unfamiliar with the program. Lowest knowledge is also shown when farmers are asked conceptually about AOTP crop insurance program. Farmers low level of knowledge is due to the limited information they obtain. Therefore, it is imperative to implement awareness and extension program to assist the farmers getting information about the crop insurance. Extension programs educate farmers about rules and regulations of the insurance plan and provide a direct linkage between farmers and the insurance company [8].

### *3.3. Farmers' perceptions about AOTP program*

Our findings (Table 2) report that farmers still perceive a negative perception toward AOTP rice insurance program because only 43.7% (less than 50%) of the farmers agreed on some level with the positively worded statements. This situation is attributed to the poor administration of AOTP crop insurance program. Farmers argue about the delayed and unsuitable expected indemnity payment. Some even express they gain no benefit from the program since they never receive the compensation payments, although suffering from crop loss. Consequently, farmers need to find another funding (banks, cooperative enterprise, and middleman) to compensate the cost they suffer from agricultural activities.

### *3.4. Farmers' participation in AOTP program*

Response toward questions which determine participation (Table 2) informs that the majority of farmers (more than 60%) opt for negatively worded statements, indicating low participation on the implementation of AOTP crop insurance program. This condition may related to farmer's perception of no benefit received from the crop insurance, causing the farmers unwilling to convey the benefits of the program to other communities. The study also shows that most farmers are never invited to get involve in premium payment process, making farmers tend to be indifferent to all activities related to the crop Insurance program. This is in line with the statement put forward by Azwar [9] that farmers will trust a project or development program more if they feel they need to be involved both in the preparation process and its implementation so that there will be a sense of ownership of a project or development program.

**Table 2.** Knowledge, perception and participation of the respondents

Statement		Yes		No			
		N	%	N	%		
Knowledge	Do you know about AOTP crop insurance program?	8	10.0	72	90.0		
	Crop insurance is implemented to protect farmers from the risk of flood, drought, and pest and diseases.	5	6.3	75	93.8		
	The aim of AOTP crop insurance is to compensate crop lost because of flood, drought, pest and diseases.	43	53.8	37	46.3		
	The advantage of joining AOTP program is that farmers will get a payment for crop loss.	48	60.0	32	40.0		
	Farmers need to pay Rp 36.000 of premium rate	48	60.0	32	40.0		
	Farmers could make an insurance claim if they pay the Rp 36.000 premium rate and suffer the total crop damage greater than or equal to 75% of the total planted area	55	68.8	25	31.3		
	The indemnity payment received by farmers if such damage occur is Rp. 6.000.000/hectare	55	68.8	25	31.3		
	The insurance covers only for one planting season (4 months)	55	68.8	25	31.3		
		Disagree		Unsure		Agree	
		N	%	N	%	N	%
Perception	The insurance company uses a proper technique to measure the damage occurs in the field	3	3.8	51	63.8	26	32.5
	AOTP crop insurance provides coverage for the risks (flood, drought, pest and diseases) attributed to the prevalence of the problem faced by farmers	3	3.8	52	65	25	31.3
	The period of coverage is appropriate	5	6.3	48	60	27	33.8
	AOTP registration procedure is uncomplicated	5	6.3	8	10	67	83.8
	The premium rate is affordable	4	5.0	10	12.5	66	82.5
	The payment of insurance claims is made on time	48	60.0	7	8.8	25	31.3
	The amount of indemnity payment is as expected	48	60.0	7	8.8	25	31.3
	The indemnity payment sufficiently covers the loss (no need to find additional funding from banks, cooperative enterprise, and middleman)	55	68.8	6	7.5	19	23.8
		Frequent		Rare		Never	
		N	%	N	%	N	%
Participation	How often do you read information about AOTP in magazines	6	7.5	26	32.5	48	60.0
	How often have you heard information about AOTP on TV/Radio	4	5	28	35	48	60.0
		more than 2 times		2 times		less than 2 times	
		N	%	N	%	N	%
	How many times have you attended meetings with farmer groups to discuss AOTP?	25	31.3	7	8.8	48	60.0
		more than 5 times		5 times		less than 5 times	
		N	%	N	%	N	%
	How many times have you attended socialization / counseling activities to discuss AOTP?	16	20	8	10	56	70.0
		Yes		Rare		No	
		N	%	N	%	N	%
	Do you take decisions and give opinions during socialization / counseling activities?	25	31.3	7	8.8	48	60.0
	Have you ever invited by the head of the farmer group to pay the premium fee to the insurance company?	25	31.3	7	8.8	48	60.0
	Did you join the mentoring program to register as the member of AOTP?	25	31.3	7	8.8	48	60.0
		Yes		Unsure		No	
		N	%	N	%	N	%
	Are you willing to apply good farming practice to meet insurance policy	25	31.3	7	8.8	48	60.0
	Are you willing to inform other farmers about the benefit of AOTP	25	31.3	7	8.8	48	60.0

### *3.5. Socioeconomic factors associated with farmers' knowledge, perception, and participation on AUTP crop insurance*

Agricultural insurance is a fairly new tool that can be used by farmers for an effective risk management in agriculture. In this section, the factors differing farmers' knowledge, perception, and participation of crop insurance in Suka Makmur Subdistrict of Aceh Besar are presented.

ANOVA tests (Table 3) indicate that variable age, education, income, area of rice field, and land ownership ( $p < 0.05$ ) significantly differ farmers' mean knowledge scores and farmers' mean perception scores. Meanwhile, farmers' mean participation scores are significantly different ( $p < 0.05$ ) based on education, income, area of rice field, and land ownership. Although a study revealed that gender influence farmers' preference for crop insurance [10], none of the scores (knowledge, perception, and participation) are significantly different based on gender. This might be related to the respondents' characteristic of this study, where most of them are better educated female. Women fail in understanding insurance contracts is attributed to their lack of confidence and low level of literacy [10].

Our findings in Table 3 show that younger farmers have more knowledge and more favorable perception of crop insurance. Previous studies have found mixed results in terms of the effect of age on the adoption of risk management tools [11, 12]. Studies also shown that there is a linkage between education with the adoption of crop insurance [13, 14]. Better educated farmers are more likely to adopt crop insurance given their more ability to understand the scheme [6]. Not only education, income is also believed as a factor that drives insurance demand through risk aversion. Farmers with high level of education and more income would be more risk averse compared to older farmers with low level of literacy and income [11]. When farmers experience more risks, they are more likely to adopt risk management strategies such as crop insurance. As expected, our results in Table 3 indicate that farmers graduating from university, and farmers earning more income, have significantly high level of knowledge, perception and participation regarding AUTP crop insurance programs.

The results also suggest that the amount of agricultural land yields a significant association with knowledge, perception and participation in crop insurance. This result is in accordance with Sadati [11]. Larger farm will normally obtain higher indemnity payment due to the higher area insured, inducing farmers' interest in AUTP crop insurance. In addition, farmers working on their own land are also significantly more knowledgeable, having more positive perception, and having more participation in crop insurance program. This is in parallel with previous study indicating that farmers' endowments are the mainspring to opt for crop insurance [6].

**Table 3.** ANOVA model of several independent variables on farmers' knowledge levels, attitude levels and perception levels

Variables	Knowledge						Perception						Participation			
	MKL	SD	F	p	Post hoc	MPeL	SD	F	p	Post hoc	MPaL	SD	F	p	Post hoc	
Age	Less than 40	13.0	2.7	4.62	0.013	a	18.5	4.3	3.63	0.031	a	17.0	7.1	2.98	0.057	
	40 to 59	11.9	2.9		a		17.3	4.4			a	14.2	7.4			
	60 or above	9.0	0.7				12.8	1.3				9.0	0.0			
Gender	Male	11.3	2.4	1.81	0.182		16.2	3.5	1.71	0.195		12.5	6.4	2.25	0.137	
	Female	12.3	3.0				17.7	4.6				15.4	7.5			
Education	Elementary	9.9	1.6	39.09	0.000	c,d	14.2	2.6	31.98	0.000	c,d	9.7	3.4	35.9	0.000	c,d
	Middle	10.3	1.1		c,d		14.8	1.3		c,d		9.9	2.8			c,d
	High	13.5	2.6		d,e		19.3	4.4		d,e		18.2	7.1			d,e
	College or university	16.0	0.0		c,e		23.5	0.9		c,e		24.8	1.7			c,e
Income	Less than 1 million rupiah	9.9	0.5	23.24	0.000	b	14.2	1.3	22.96	0.000	b	9.0	0.0	27.2	0.000	b
	1 million to 2 million rupiah	13.6	3.0				19.7	4.5				18.7	7.3			
	More than 2 million rupiah	11.0	2.4				15.8	2.2				13.5	5.2			
Area of rice field	<0.5	10.8	2.1	15.30	0.000		15.3	3.3	18.48	0.000		11.0	5.2	24.2	0.000	
	≥0.5	13.1	3.1				19.2	4.5				18.0	7.3			
Land ownership	Self-owned	14.6	2.2	87.58	0.000		21.0	3.6	67.90	0.000		21.3	5.6	93.1	0.000	
	Rent/yard share	10.3	1.8				14.9	3.0				10.3	4.5			

MKL: mean knowledge level; MPeL: mean perception level, MPaL: mean participation level;

<sup>a</sup> p value <0.05 analysed using Post Hoc test (95% confidence interval) for comparison with group of 60 or above;<sup>b</sup> p value <0.05 analysed using Post Hoc test (95% confidence interval) for comparison with group of 1 million to 2 million rupiah;<sup>c</sup> p value <0.05 analysed using Post Hoc test (95% confidence interval) for comparison with group of high school;<sup>d</sup> p value <0.05 analysed using Post Hoc test (95% confidence interval) for comparison with group of college or university;<sup>e</sup> p value <0.05 analysed using Post Hoc test (95% confidence interval) for comparison with group of elementary and middle school



#### 4. Conclusion

Our study demonstrates a low level of knowledge, perception and participation among farmers in Suka Makmur Subdistrict toward the implementation of AUTP crop insurance. This may affect the long-term sustainability of the crop insurance program in village level, despite its role as an effective tool for risk management in agriculture. Emphasizing on program to boost the level of knowledge, perception and participation of the farmers is imperative. This can be achieved through improvement on implementation awareness and extension program of AUTP, policies and practices by government and its related agencies. Moreover, the insurers will also need to improve their services, thereby gaining and retaining the trust and loyalty from farmers. This study also reveals that knowledge, perception and participation levels are varied significantly based on age, education, household income, rice field area, land ownership. Therefore, an individualized specific education and assistantship program tailored to farmers' level of education and understanding is preferable.

#### 5. Reference

- [1] Pasaribu S M and Sudijanto A 2013 Rice crop insurance pilot project: an implementation review. *Technical report of JICA project of capacity development for climate change strategies in Indonesia* (Jakarta, Indonesia: Ministry of Agriculture - JICA)
- [2] Kawanishi M and Mimura N 2015 Assessment of insurance for paddy production: a case study in Indonesia *Clim. Dev.* **7** 257–66.
- [3] Putri I Dharmawan K and Tastrawati N 2017 Perhitungan harga premi asuransi pertanian yang berbasis indeks curah hujan menggunakan metode black scholes *E-Jurnal Mat.* **6** 161-7
- [4] Mishra A K and Goodwin B K 2006 Revenue insurance purchase decisions of farmers *Appl. Econ.* **38** 149–59
- [5] Sherrick B J, Barry P J, Ellinger P N, and Schnitkey G D 2004 Factors influencing farmers' crop insurance decisions *Am. J. Agric. Econ.* **86** 103–14
- [6] Ye T, Liu Y, Wang J, Wang M and Shi P 2016 Farmers' crop insurance perception and participation decisions: empirical evidence from Hunan, China *J. Risk Res.* 1-14
- [7] Enjolras G and Sentis P 2011 Crop insurance policies and purchases in France *Agric. Econ.* **42** 475–86.
- [8] Jayathilaka D P D M and Abeynayake N R 2013 Assessing farmers' perception, awareness and influential factors to purchase a crop insurance as a tool for risk management *Proc. 12th Agric. Res. Symp.* 394-398
- [9] Azwar A, Muljono P and Herawati T 2016 Persepsi dan partisipasi petani dalam pelaksanaan kegiatan rehabilitasi tanaman kakao di Kabupaten Sigi Provinsi Sulawesi Tengah *J. Penyul* **2** 157-67
- [10] Akter S, Krupnik J T, Rossi F, and Khanam F 2016 The influence of gender and product design on farmers' preferences for weather-indexed crop insurance *Glob. Environ. Chang.* **38** 217-29.
- [11] Sadati A S, Ghobadi R F, Mohamadi Y, Sharif O, and Asakereh A 2010 Survey of effective factors on adoption of crop insurance among farmers: A case study of Behbahan County *African J. Agric. Res.* **5** 2237-42
- [12] Torkani 2002 Final reports of plan efficiency of wheat insurance *Planning Research and Agricultural Economic Institution of Agricultural Department* (Tehran, Iran)
- [13] Goodwin B K and Kastens T L 1993 Adverse selection, disaster relief, and the demand for multiple peril crop insurance *Contract report for the Federal Crop Insurance Corporation*
- [14] Smith V H and Bacquet A E 1996 The demand for multiple peril crop insurance: Evidence from Montana wheat farms' *Am. J. Agric. Econ.* **78** 428– 438

**Acknowledgments**

We would like to thank to Suka Makmur subdistrict government officials, colleagues from Agribusiness Department, Syiah Kuala University and all parties who have contributed to this study. Special thanks to Yusuf Nawawi for his meticulous review onto this manuscript development.