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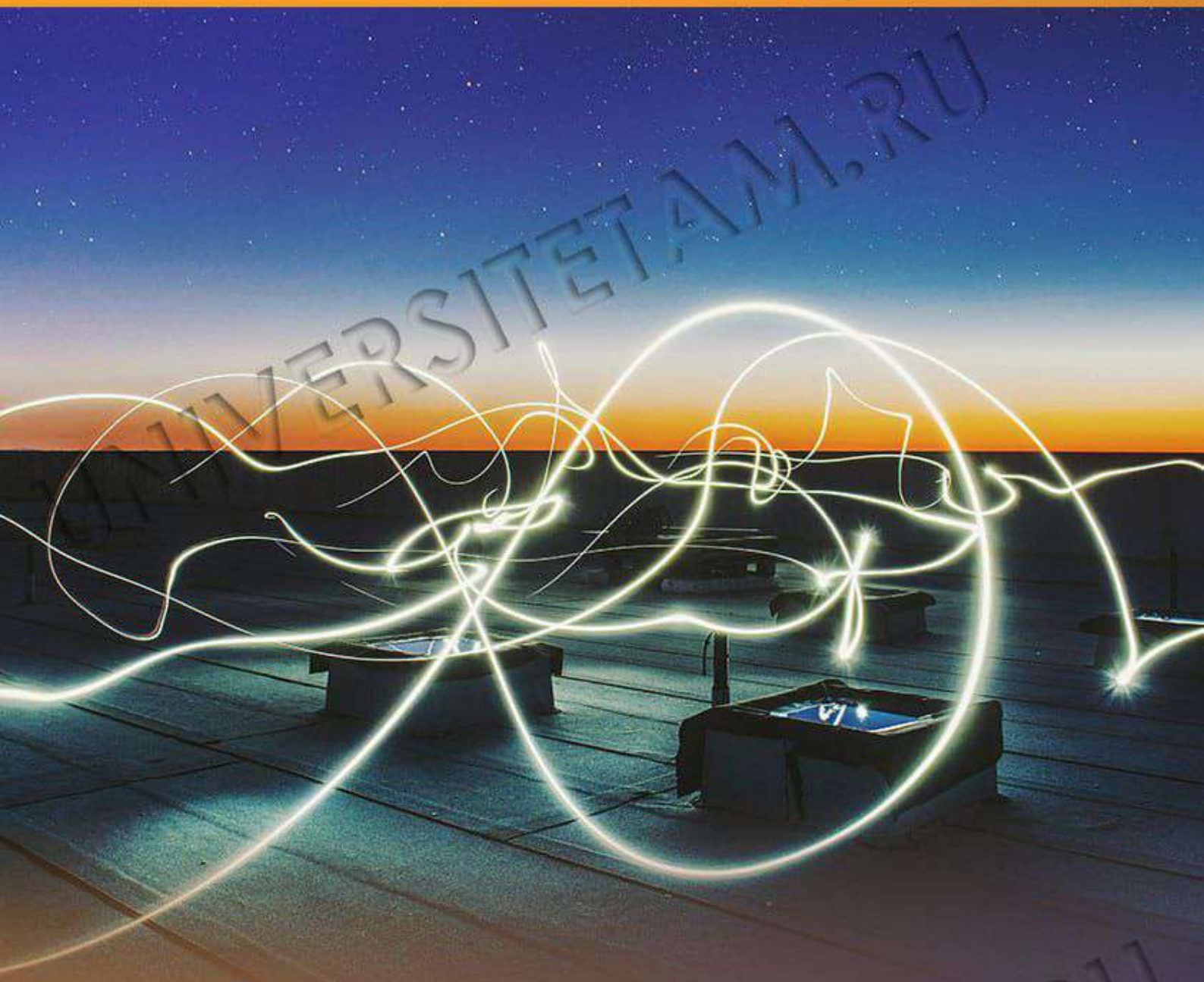

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UNIVERSITAS MUHAMMADIYAH MALANG

PREFACE: the 1st ICoN-BEAT 2019

On behalf of the organizing committee of the 1st International Conference on Bioenergy and Enviromentally Sustainable Agriculture Technology (ICoN-BEAT 2019) and conjunction with the 2nd Congress Indonesian Agriculture Private University Association (APTSIPI - *Asosiasi Perguruan Tinggi Swasta Ilmu Pertanian Indonesia*). It is an honor and delight to welcome all participants to this conference which be held at the Campus III, University of Muhammadiyah Malang (UMM), Indonesia on November 7th to 8th, 2019. The conference theme is "Bioenergy and Environmentally Sustainable Agriculture Technologies: Toward Food, Energy and Water Sovereignty".

This conference has been organized by Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang. Two main topics have been discussed, i.e. bioenergy and other renewable energy, and environmentally sustainable agriculture. We are perceived confidently that this conference will provide positive influence and contribute to develop the academic field.

Supporting two main topics, the 1st ICoN - BEAT invited five experts in the fields of energy, environment and agriculture from Indonesia, Malaysia, and Thailand. The speakers are Mr. Arfie Thahar (Research and Development Division of the Indonesian Palm Oil Plantation Fund Management Agency, Jakarta), Assoc. Prof. Dr. Maizirwan Mel (Department of Biotecnology Engineering, International Islam University, Malaysia), Asst. Prof. Dr. Khwunta Khwamee (Department of Earth Science, Faculty of Natural Resources, Price of Songkla University, Thailand), Mr. Paulus Tjakrawan (Executive Chairman of the Indonesian Biofuel Entrepreneurs Association, Jakarta), and Assoc. Prof. Dr. Tatang Hernas Soerawidjaja (Chairman of the Indonesian Bioenergy Association, Indonesian Research Council Commission, and Department of Chemical Engineering - Bandung Institute of Technology).

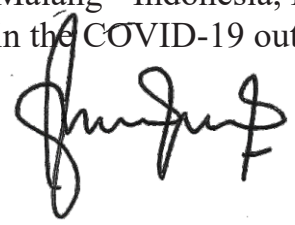
A pride because the number of participants who already send the paper about 116 presenters. After a rigorous selection process, the Scientific & Editorial Board of the 1st ICoN - BEAT 2019 decided to publish 51 papers in E3S Web of Conferences, an open-access proceedings in environment, energy and earth sciences, managed by EDP Sciences, Paris, France and indexed on Scopus, Scimago, Conference Proceedings Citation Index-Science (CPCI-S) of Clarivate Analytics's Web of Science, and DOAJ (Directory of Open Access Journals).

The Proceeding of the 1st ICoN - BEAT 2019, consists of 51 selected papers, amount 38 papers were the results of joint research by Indonesian and overseas scholars. In the collaboration research, 71 institutions were involved 20 of which were from abroad Indonesia. The overseas institutions are from: Australia, Austria, Czech, Estonia, Eswani, Georgia, Germany, India, Japan, Latvia, Lithuania, Madagascar, Malaysia, the Netherlands, P.R. China, Sweden, Taiwan - ROC, Thailand, the United Kingdom, and Uzbekistan. Each of the papers submitted in E3S Web of Conferences was reviewed by at least two experts using the double-blind system. The published papers have passed all necessary improvement requirements in accordance to the Web of Conferences standard, reviewer's comments, SI (*Système International d'Unités*), similarity tests by Turnitin program (with the highest threshold of 20 %), 90 % of references must be at least dated from 15 years, and reflected on Google, as well as editing procedure by professional editors from four countries (Estonia, Indonesia, Lithuania, and Malaysia).

Last but not least, I personally would like to thank you the official committees, organizing partners, and scientific & editorial board. Special thanks as well to our co-host partners: i) APTSIPI, ii) ILUNET (*Ikatan Alumni Energi Terbarukan*) University of Darma Persada, Jakarta, iii) Konsorsium Bioteknologi Indonesia, iv) Merdeka University of Madiun, v) University of Veteran Bangun Nusantara, Sukoharjo, vi) C- BIORE (Center of Biomass and Renewable Energy), vii) ITENAS (*Institut Teknologi Nasional*), viii) ILCAN (Indonesian Life Cycle Assessment Network), ix) *Rumah Paper Kita* as editing and proofreading services for supporting the 1st ICoN - BEAT 2019.

Finally, I would like to express my gratitude feeling for your participations, and please prepare yourself to gain the treasure of knowledge from the passionate experts. Then share the valuable enlightenment for a better future. It is my pleasure to see many of you in the 1st ICoN - BEAT 2019, and see you again in the 2nd ICoN - BEAT 2021.
Stay safe and stay healthy in COVID-19 pandemic.

With warmest regards
Malang - Indonesia, Dec 12, 2020
in the COVID-19 outbreak



Dr. Ir. Listiari Hendraningsih, M.P.
Conference Chair

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E3S Web of Conferences
Volume 226 (2021)
The 1st International Conference on Bioenergy and Environmentally Sustainable Agriculture Technology (ICoN BEAT 2019)
Malang, East Java, Indonesia, November 7-8, 2019

R. Hendroko Setyobudi, A. Winaya, J. Burlakovs, M. Mel and O. Anne (Eds.)

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Factors that Influence Farmer's Behavior Towards Risk

Muhamad Nurdin Yusuf*, *Agus* Yuniawan Isyanto, and *Sudradjat* Sudradjat

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Abstract. The research was carried out with the aim to find out the behavior of farmers towards risk and the factors that influence it. The research sample was 100 paddy farmers in flood-prone area paddy fields in Pangandaran District, West Java Province, Indonesia. Farmer's behavior towards risk was analyzed using quadratic utility functions, while the factors that influence farmer's behavior towards risk were analyzed using logistic regression. The results showed farmers 87 was risk neutral, while 13 farmer risk takers were farmers. Education, familys size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

Keywords: Land area, logistic regression, risk taker, quadratic utility.

1 Introduction

The impact of global climate change has an effect on paddy production in Indonesia in the form of flooding which results in crop failure or a decrease in paddy production [1]. Climate change has occurred in Indonesia with indications of an increase in temperature and changes in rainfall patterns. Agriculture is very vulnerable to the effects of climate change with an indication of the high level of danger in decreasing paddy production as a result of increasing temperatures and changes in rainfall patterns. The average decline in paddy production is 1.37 % yr^{-1} which has the potential to cause a decline in national food production [2].

The threat of flooding in paddy fields can lead to reduced harvest area and paddy production [3]. Production is related to the nature of farming which is always dependent on nature supported by risk factors [4]. The risk of failure in farming comes from the use of new technology, prices of agricultural production, capital, government policies and individual behavior of farmers in dealing with outsiders [5], as well as climate change and weather that are not in accordance with crop needs [6]. The main risks farming include flooding [7].

Farmer's behavior towards risk consists of risk averter, risk neutral, and risk taker. Farmer behavior is the basis of farmers' decision making in carrying out their farming [1]. Farmer's behavior towards risk has an important role in influencing the productivity of agricultural products which has an impact on production efficiency [8]. Factors that

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influence farmer behavior towards risk are the area of planting, age, education, experience, family size, income and productivity risk [8].

2 Research methodology

Amount ten villages in Padaherang and Kalipucang Subdistricts in Pangandaran District were taken purposively as a sample area with consideration of being areas that have flood-prone rice fields. From each village a sample of ten farmers was taken, so that the total number of samples was 100 farmers.
Farmer's behavior towards farming risk was analyzed using the quadratic utility Equation (1):

$$U = \tau_1 + \tau_2 M + \tau_3 M^2 \quad (1)$$

Where:
U : utility for expected income (in util)
τ_1 : intercept
M : expected income at the balance point (rupiah value from certainty equivalent (CE)
τ_2 : indifference income coefficient (CE)
τ_3 : farmer risk coefficient

The risk preference coefficient shows the farmer's attitude to risk, namely:
$\tau_3 = 0$: Risk neutral
$\tau_3 < 0$: Risk averse
$\tau_3 > 0$: Risk taker

The factors that influence farmers' behavior towards risk are analyzed using ordinal logit regression with the following Equation (2):

$$P_i = F(Y_i) = F(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_8 D_8 + \beta 9 D9 + \beta_{10} D) \quad (2)$$

Y_i values are calculated using the following Equation (3):

$$Y_i = Log\,[P_i/(1-P_i)] = (\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} D + e) \quad (3)$$

Where:

Y_i = Opportunities for farmers to make decisions, where:
Y_1 = 1 for the farmer who are risk averse
Y_2 = 2 for the farmer who are risk neutral
Y_3 = 3 for the farmer who are risk taker
α = Intercept
β_i = Parameter regression coefficient (i = 1, 2, 3,….10)
X_1 = Age (year)
X_2 = Education (year)
X_3 = Family size (person)
X_4 = Experience (year)
X_5 = Land area (ha)
X_6 = Farm income (IDR)
X_7 = Production risk
X_8 = Price risk
X_9 = Income risk
D = Membership in groups (1 if being a member of a group, 0 if not)
e = error term

3 Results and discussion

3.1 Farmer's behavior towards risk

Farmer's behavior towards risk in paddy farming in flood-prone paddy fields can be seen in Table 1.

Table 1. Farmer's behavior towards risk

Farmer's behavior towards risk	Number of people	Percentage
Risk Neutral	87	87.00
Risk Taker	13	13.00
Total	100	100.00

Table 1 shows that most farmers (87 %) are risk neutral, while the rest (13 %) are risk takers. There are no risk averse farmers. According to [9], the absence of risk avers farmers show that there are no farmers who are willing to sacrifice their income or potential income to reduce opportunities for loss or low income. According to [1], farmers will try to avoid failure and not get big profits by taking risks. Such behavior is called safety first, which is characteristic of most farmers.

Farmers who are risk neutral are farmers who have a rational attitude in facing risks [9]. Risk neutral farmers tend to cultivate based on hereditary habits. They only seek income that can meet their family's needs [10]. If there is additional capital for risk neutral farmers, then they might add input to get higher income [11]. The availability of capital for farmers is a risk factor that is considered to affect farmers to the farming they are doing [12].

Risk taker farmers are farmers who are willing to allocate and use their production factors to the maximum, even though there are risks that must be faced with the aim of obtaining optimal results. [8] states that conceptually farmers are able to reduce production risk and price risk by improving their productivity, the use of diversification, the use of appropriate cropping patterns, strengthening farmer institutions, and bargaining position of farmers can increase farmers' production and income [7].

3.2 Factors that influence farmer's behavior toward risk

The results of the analysis of factors that influence farmer behavior on risk in paddy farming in flood-prone paddy fields can be seen in Table 2.

Table 2. Factors that influence farmer's behavior towards risk

Variabel	B	Wald	Exp(B)
Age	0.788	0.020	2.199
Education	7.139	3.452**	1.260E3
Family size	4.983	4.303*	145.958
Experience	-0.149	0.003	0.861
Land area	0.687	0.279	1.988
Farm income	2.896	4.313*	18.103

(Continued on next page)

Table 2. Continued

Variabel	**B**	**Wald**	**Exp(B)**
Production risk	1.029	0.407	2.799
Price risk	-0.834	1.016	0.434
Income risk	-0.134	0.014	0.875
Group	1.795	0.946	6.020
Constant	-69.854	3.703**	0.000
Model Summary			
-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square	Chi-square
19.158	0.441	0.819	18.307*

*,** = significant at 5 %, 10 %

Table 2 shows that age is not significant influence farmers' behavior towards risk. This shows that the difference in age of farmers does not affect the behavior of farmers in dealing with risk. Education significantly influences farmer's behavior towards risk. The results of this study are in accordance with the results of research from [13]. The higher the level of education of farmers, the more courageous farmers face risks [5, 7]. According to [13], the level of education of farmers who are still low makes the main cause of the majority of farmers who choose safety first (zero risk) behavior in developing their farming.

Family size significantly influences farmer's behavior towards risk. The results of this study are in accordance with the results of research by [14]. According to [9], family size affects the outpouring of time that can be allocated for farming. According to [14], the more number of members of the farmer's family, the higher the capacity of the workforce owned by the farmer in facing the risk.

Experience does not significantly influence farmers' behavior towards risk. The longer the farmer's experience, the more careful it will be in carrying out farming so that it tends to be more neutral to risk. The results of this study are in accordance with the results of research from [7].

Land area does not significantly affect farmer's behavior to risk. The results of this study are consistent with the results of a study from [5] which shows that the addition or reduction of land area will not reduce risk aversion or that farmers are neutral towards risk.

Revenue significantly influences farmer's behavior towards risk. The greater the income the farmer receives from the farming that is carried out, the farmer will be more courageous in accepting the risk. The results of this study are in accordance with the results of research from [8, 14, 5]. According to [8], the higher the farm income received by farmers, the farmers will be more willing to accept the risk.

Production risk does not significantly influence farmer's behavior towards risk. According to [7], the magnitude of the risk of production faced by farmers due to the uncertainty of results as a result of natural factors and income as a result of price fluctuations, causes farmers to tend to reject the possibility of accepting the risks and uncertainties of the business. According to [15], efforts to handle production risk can be done by implementing a diversification and agricultural insurance program.

Price risk does not significantly influence farmer's behavior towards risk. According to [16], farmers' household attitudes in carrying out production activities can be seen from variations in prices as a measure of price risk. According to [17], the behavior of farmers who accept price risk is caused by the expectation of expected price reductions compared to the actual prices that make farmers continue to carry out farming as long as they provide benefits. According to [18], the behavior of farmers does not dare to risk due to fluctuations

in production and selling prices which will have an impact on farmers' income.

Income risk does not significantly influence farmer behavior towards risk. The higher the income risk faced by farmers, the more farmers will behave neutrally against risk. Membership in groups does not significantly influence farmers' behavior towards risk. According to [19], group membership is one of the efforts of farmers to reduce the risk of farming by cooperating with each other, exchanging information in managing their farming with fellow farmers.

4 Conclusion

Amount 87 farmers are risk neutral and 13 farmers are risk takers. Education, family size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

References

1. C. Gardebroek, M.D. Chavez, A.O. Lansink, J. Agric. Econ. **61**,1:60–75(2010). https://doi.org/10.1111/j.1477-9552.2009.00222.x
2. Ruminta, Handoko, T. Nurmala. Jurnal Agro. **5**,1:48–60(2018). [in Bahasa Indonesia]. https://journal.uinsgd.ac.id/index.php/ja/article/download/1607/pdf_16
3. Shahab. E. Saqib, Mokbul. M. Ahmad, Sanaullah. P, Irfan. A Rana, Int. J. Disaster Risk Reduc. **18:**107–114(2016). https://www.researchgate.net/profile/Shahab_E_Saqib/publication/304305997_An_Empirical_Assessment_of_Farmers%27_Risk_Attitudes_in_Flood-Prone_Areas_of_Pakistan/links/5bf55cd2299bf1124fe32898/An-Empirical-Assessment-of-Farmers-Risk-Attitudes-in-Flood-Prone-Areas-of-Pakistan.pdf?origin=publication_detail
4. C. Gardebroek, Eur. Rev. Agric. Econ. **33**,4:485–510(2006). https://doi.org/10.1093/erae/jbl029
5. M.P. Lucas, I.M. Pabuayon., Asian J. Agric. Dev. **8**,2:61–77(2011). https://tind-customer-agecon.s3.amazonaws.com/9fdd6f1e-7e97-4413-a5f2-ffb38a8fea0c?response-content-disposition=attachment%3B%20filename%2A%3DUTF-8%27%27AJAD_2011_8_2_5Lucas.pdf&response-content-type=application%2Fpdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Expires=86400&X-Amz-Credential=AKIAXL7W7Q3XHXDVDQYS%2F20200908%2Feu-west-1%2Fs3%2Faws4_request&X-Amz-SignedHeaders=host&X-Amz-Date=20200908T165030Z&X-Amz-Signature=20ca172c04b02c087149aa1ba32cc86309bf574faede65f1910b98ade0e76e34
6. T. Tiedemann, U.L. Lohman, J. Agric. Econ. **64**,1:73–96(2012). https://doi.org/10.1111/j.1477-9552.2012.00364.x
7. J.N. Nmadu, G.P. Eze, A.J. Jirgi. British J. Econ. Manag. Trade, **2,**2:92–108(2012). https://www.journaljemt.com/index.php/JEMT/article/download/30022/56339
8. R. Darma, T.N.A. Rahmadanih, R. Amandaria. Int. J. Agric. Syst. **2**,1:77–89(2014). http://pasca.unhas.ac.id/ojs/index.php/ijas/article/download/24/23
9. E.D. Oruonye, IJFSE. **3**,4:113–117(2013). http://www.ijfse.com/uploadedfiles/IJFSEArchive/IJFSE2013/3(4)/01.pdf
10. M.C. Plaxedes, P. Mafongoya, Clim. Risk Manag. **16**:145–163(2017). https://doi.org/10.1016/j.crm.2017.02.001

11. Y. Ferrianta, M.F. Makki, Suprijanto, Rifiana. Int. J. Agric. Manag. Dev. **5**,2:133–139(2014). https://www.researchgate.net/publication/272667859_Risk_Analysis_and_Strategy_of_Rice_Farmers_in_Swampland_in_the_Face_of_Climate_Change_Impact_Case_in_South_Kalimantan_Province-Indonesia/fulltext/57a79def08aee07544c1d003/Risk-Analysis-and-Strategy-of-Rice-Farmers-in-Swampland-in-the-Face-of-Climate-Change-Impact-Case-in-South-Kalimantan-Province-Indonesia.pdf?origin=publication_detail
12. A.D. Brauw, P. Eozenou. J. Dev. Econ. **111:**61–74(2014). https://www.researchgate.net/profile/Patrick_Eozenou/publication/266617635_Measuring_risk_attitudes_among_Mozambican_farmers/links/5435ad990cf2643ab9867e0d/Measuring-risk-attitudes-among-Mozambican-farmers.pdf?origin=publication_detail
13. C.A. Kalu, J.A. Mbanasor. NAPReJ, **1**,1:1–10(2016). https://econpapers.repec.org/scripts/redir.pf?u=https%3A%2F%2Fdoi.org%2F10.22004%252Fag.econ.292052;h=repec:ags:naprej:292052
14. M.M. Haque, S. Bremer, S. Aziz, J.P. Sluijs, Clim. Risk Manag. **16:**43–58(2017). https://dx.doi.org/10.1016/j.crm.2016.12.002
15. S. Dadzie, N. Kwesi, H. de Graft. A, Int. J. Agric. For. **2**,2:29–37(2012). https://www.researchgate.net/profile/Samuel_Dadzie/publication/241699647_Attitudes_Toward_Risk_and_Coping_Responses_The_Case_of_Food_Crop_Farmers_at_Agona_Duakwa_in_Agona_East_District_of_Ghana/links/0046351caa436af152000000/Attitudes-Toward-Risk-and-Coping-Responses-The-Case-of-Food-Crop-Farmers-at-Agona-Duakwa-in-Agona-East-District-of-Ghana.pdf?origin=publication_detail
16. S.R. Fajri, E. Fauziyah. J. Hort. Indonesia, **9**,3:188–196(2018). [in Bahasa Indonesia] https://journal.ipb.ac.id/index.php/jhi/article/download/26496/17128/
17. C. Mulwa, P. Marenya, D.B. Rahut, M. Kassie, Clim. Risk Manag. **16**:208–221(2017). https://reader.elsevier.com/reader/sd/pii/S2212096317300062?token=8C6D3F91A4BEF28A0A8335A476A7B6B75EB4D84ED7742D9C358F0465D68675FD002D8C4A371BC054A01FAF3CD18289A8
18. A. Ali, O. Erenstein, Clim. Risk Manag. **16**:1–12(2017). https://www.researchgate.net/profile/Olaf_Erenstein/publication/311879490_Assessing_farmer_use_of_climate_change_adaptation_practices_and_impacts_on_food_security_and_poverty_in_Pakistan/links/58b71affaca27261e51a4134/Assessing-farmer-use-of-climate-change-adaptation-practices-and-impacts-on-food-security-and-poverty-in-Pakistan.pdf?origin=publication_detail
19. A. Tripathi, A.K. Mishra. Clim. Risk Manag. **16**:1–37(2017). https://www.researchgate.net/publication/310815962_Knowledge_And_Passive_Adaptation_to_Climate_Change_an_Example_From_Indian_Farmers/fulltext/583a4d6308ae3a74b49ea7e4/Knowledge-And-Passive-Adaptation-to-Climate-Change-an-Example-From-Indian-Farmers.pdf?origin=publication_detail

PAPER NAME

e3sconf_icon-beat2019_00030.pdf

WORD COUNT

2592 Words

CHARACTER COUNT

14492 Characters

PAGE COUNT

6 Pages

FILE SIZE

186.1KB

SUBMISSION DATE

Apr 4, 2023 12:37 PM GMT+7

REPORT DATE

Apr 4, 2023 12:37 PM GMT+7

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Factors that Influence Farmer's Behavior Towards Risk

Muhamad Nurdin Yusuf*, *Agus* Yuniawan Isyanto, and *Sudradjat* Sudradjat

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Abstract. The research was carried out with the aim to find out the behavior of farmers towards risk and the factors that influence it. The research sample was 100 paddy farmers in flood-prone area paddy fields in Pangandaran District, West Java Province, Indonesia. Farmer's behavior towards risk was analyzed using quadratic utility functions, while the factors that influence farmer's behavior towards risk were analyzed using logistic regression. The results showed farmers 87 was risk neutral, while 13 farmer risk takers were farmers. Education, familys size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

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1 Introduction

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Y_i values are calculated using the following Equation (3):

$$Y_i = Log\,[P_i/(1-P_i)] = (\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} D + e) \quad (3)$$

Where:

Y_i = Opportunities for farmers to make decisions, where:
Y_1 = 1 for the farmer who are risk averse
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α = Intercept
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D = Membership in groups (1 if being a member of a group, 0 if not)
e = error term

3 Results and discussion

3.1 Farmer's behavior towards risk

Farmer's behavior towards risk in paddy farming in flood-prone paddy fields can be seen in Table 1.

Table 1. Farmer's behavior towards risk

Farmer's behavior towards risk	Number of people	Percentage
Risk Neutral	87	87.00
Risk Taker	13	13.00
Total	100	100.00

Table 1 shows that most farmers (87 %) are risk neutral, while the rest (13 %) are risk takers. There are no risk averse farmers. According to [9], the absence of risk avers farmers show that there are no farmers who are willing to sacrifice their income or potential income to reduce opportunities for loss or low income. According to [1], farmers will try to avoid failure and not get big profits by taking risks. Such behavior is called safety first, which is characteristic of most farmers.

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3.2 Factors that influence farmer's behavior toward risk

The results of the analysis of factors that influence farmer behavior on risk in paddy farming in flood-prone paddy fields can be seen in Table 2.

Table 2. Factors that influence farmer's behavior towards risk

Variabel	B	Wald	Exp(B)
Age	0.788	0.020	2.199
Education	7.139	3.452**	1.260E3
Family size	4.983	4.303*	145.958
Experience	-0.149	0.003	0.861
Land area	0.687	0.279	1.988
Farm income	2.896	4.313*	18.103

(Continued on next page)

Table 2. Continued

Variabel	B	Wald	Exp(B)
Production risk	1.029	0.407	2.799
Price risk	-0.834	1.016	0.434
Income risk	-0.134	0.014	0.875
Group	1.795	0.946	6.020
Constant	-69.854	3.703**	0.000
Model Summary			
-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square	Chi-square
19.158	0.441	0.819	18.307*

*,** = significant at 5 %, 10 %

Table 2 shows that age is not significant influence farmers' behavior towards risk. This shows that the difference in age of farmers does not affect the behavior of farmers in dealing with risk. Education significantly influences farmer's behavior towards risk. The results of this study are in accordance with the results of research from [13]. The higher the level of education of farmers, the more courageous farmers face risks [5, 7]. According to [13], the level of education of farmers who are still low makes the main cause of the majority of farmers who choose safety first (zero risk) behavior in developing their farming.

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Land area does not significantly affect farmer's behavior to risk. The results of this study are consistent with the results of a study from [5] which shows that the addition or reduction of land area will not reduce risk aversion or that farmers are neutral towards risk.

Revenue significantly influences farmer's behavior towards risk. The greater the income the farmer receives from the farming that is carried out, the farmer will be more courageous in accepting the risk. The results of this study are in accordance with the results of research from [8, 14, 5]. According to [8], the higher the farm income received by farmers, the farmers will be more willing to accept the risk.

Production risk does not significantly influence farmer's behavior towards risk. According to [7], the magnitude of the risk of production faced by farmers due to the uncertainty of results as a result of natural factors and income as a result of price fluctuations, causes farmers to tend to reject the possibility of accepting the risks and uncertainties of the business. According to [15], efforts to handle production risk can be done by implementing a diversification and agricultural insurance program.

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in production and selling prices which will have an impact on farmers' income.

Income risk does not significantly influence farmer behavior towards risk. The higher the income risk faced by farmers, the more farmers will behave neutrally against risk. Membership in groups does not significantly influence farmers' behavior towards risk. According to [19], group membership is one of the efforts of farmers to reduce the risk of farming by cooperating with each other, exchanging information in managing their farming with fellow farmers.

4 Conclusion

Amount 87 farmers are risk neutral and 13 farmers are risk takers. Education, family size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

References

1. C. Gardebroek, M.D. Chavez, A.O. Lansink, J. Agric. Econ. **61**,1:60–75(2010). https://doi.org/10.1111/j.1477-9552.2009.00222.x
2. Ruminta, Handoko, T. Nurmala. Jurnal Agro. **5**,1:48–60(2018). [in Bahasa Indonesia]. https://journal.uinsgd.ac.id/index.php/ja/article/download/1607/pdf_16
3. Shahab. E. Saqib, Mokbul. M. Ahmad, Sanaullah. P, Irfan. A Rana, Int. J. Disaster Risk Reduc. **18:**107–114(2016). https://www.researchgate.net/profile/Shahab_E_Saqib/publication/304305997_An_Empirical_Assessment_of_Farmers%27_Risk_Attitudes_in_Flood-Prone_Areas_of_Pakistan/links/5bf55cd2299bf1124fe32898/An-Empirical-Assessment-of-Farmers-Risk-Attitudes-in-Flood-Prone-Areas-of-Pakistan.pdf?origin=publication_detail
4. C. Gardebroek, Eur. Rev. Agric. Econ. **33**,4:485–510(2006). https://doi.org/10.1093/erae/jbl029
5. M.P. Lucas, I.M. Pabuayon., Asian J. Agric. Dev. **8**,2:61–77(2011). https://tind-customer-agecon.s3.amazonaws.com/9fdd6f1e-7e97-4413-a5f2-ffb38a8fea0c?response-content-disposition=attachment%3B%20filename%2A%3DUTF-8%27%27AJAD_2011_8_2_5Lucas.pdf&response-content-type=application%2Fpdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Expires=86400&X-Amz-Credential=AKIAXL7W7Q3XHXDVDQYS%2F20200908%2Feu-west-1%2Fs3%2Faws4_request&X-Amz-SignedHeaders=host&X-Amz-Date=20200908T165030Z&X-Amz-Signature=20ca172c04b02c087149aa1ba32cc86309bf574faede65f1910b98ade0e76e34
6. T. Tiedemann, U.L. Lohman, J. Agric. Econ. **64**,1:73–96(2012). https://doi.org/10.1111/j.1477-9552.2012.00364.x
7. J.N. Nmadu, G.P. Eze, A.J. Jirgi. British J. Econ. Manag. Trade, **2,**2:92–108(2012). https://www.journaljemt.com/index.php/JEMT/article/download/30022/56339
8. R. Darma, T.N.A. Rahmadanih, R. Amandaria. Int. J. Agric. Syst. **2**,1:77–89(2014). http://pasca.unhas.ac.id/ojs/index.php/ijas/article/download/24/23
9. E.D. Oruonye, IJFSE. **3**,4:113–117(2013). http://www.ijfse.com/uploadedfiles/IJFSEArchive/IJFSE2013/3(4)/01.pdf
10. M.C. Plaxedes, P. Mafongoya, Clim. Risk Manag. **16**:145–163(2017). https://doi.org/10.1016/j.crm.2017.02.001

11. Y. Ferrianta, M.F. Makki, Suprijanto, Rifiana. Int. J. Agric. Manag. Dev. **5**,2:133–139(2014). https://www.researchgate.net/publication/272667859_Risk_Analysis_and_Strategy_of_Rice_Farmers_in_Swampland_in_the_Face_of_Climate_Change_Impact_Case_in_South_Kalimantan_Province-Indonesia/fulltext/57a79def08aee07544c1d003/Risk-Analysis-and-Strategy-of-Rice-Farmers-in-Swampland-in-the-Face-of-Climate-Change-Impact-Case-in-South-Kalimantan-Province-Indonesia.pdf?origin=publication_detail
12. A.D. Brauw, P. Eozenou. J. Dev. Econ. **111:**61–74(2014). https://www.researchgate.net/profile/Patrick_Eozenou/publication/266617635_Measuring_risk_attitudes_among_Mozambican_farmers/links/5435ad990cf2643ab9867e0d/Measuring-risk-attitudes-among-Mozambican-farmers.pdf?origin=publication_detail
13. C.A. Kalu, J.A. Mbanasor. NAPReJ, **1**,1:1–10(2016). https://econpapers.repec.org/scripts/redir.pf?u=https%3A%2F%2Fdoi.org%2F10.22004%252Fag.econ.292052;h=repec:ags:naprej:292052
14. M.M. Haque, S. Bremer, S. Aziz, J.P. Sluijs, Clim. Risk Manag. **16:**43–58(2017). https://dx.doi.org/10.1016/j.crm.2016.12.002
15. S. Dadzie, N. Kwesi, H. de Graft. A, Int. J. Agric. For. **2**,2:29–37(2012). https://www.researchgate.net/profile/Samuel_Dadzie/publication/241699647_Attitudes_Toward_Risk_and_Coping_Responses_The_Case_of_Food_Crop_Farmers_at_Agona_Duakwa_in_Agona_East_District_of_Ghana/links/0046351caa436af152000000/Attitudes-Toward-Risk-and-Coping-Responses-The-Case-of-Food-Crop-Farmers-at-Agona-Duakwa-in-Agona-East-District-of-Ghana.pdf?origin=publication_detail
16. S.R. Fajri, E. Fauziyah. J. Hort. Indonesia, **9**,3:188–196(2018). [in Bahasa Indonesia] https://journal.ipb.ac.id/index.php/jhi/article/download/26496/17128/
17. C. Mulwa, P. Marenya, D.B. Rahut, M. Kassie, Clim. Risk Manag. **16**:208–221(2017). https://reader.elsevier.com/reader/sd/pii/S2212096317300062?token=8C6D3F91A4BEF28A0A8335A476A7B6B75EB4D84ED7742D9C358F0465D68675FD002D8C4A371BC054A01FAF3CD18289A8
18. A. Ali, O. Erenstein, Clim. Risk Manag. **16**:1–12(2017). https://www.researchgate.net/profile/Olaf_Erenstein/publication/311879490_Assessing_farmer_use_of_climate_change_adaptation_practices_and_impacts_on_food_security_and_poverty_in_Pakistan/links/58b71affaca27261e51a4134/Assessing-farmer-use-of-climate-change-adaptation-practices-and-impacts-on-food-security-and-poverty-in-Pakistan.pdf?origin=publication_detail
19. A. Tripathi, A.K. Mishra. Clim. Risk Manag. **16**:1–37(2017). https://www.researchgate.net/publication/310815962_Knowledge_And_Passive_Adaptation_to_Climate_Change_an_Example_From_Indian_Farmers/fulltext/583a4d6308ae3a74b49ea7e4/Knowledge-And-Passive-Adaptation-to-Climate-Change-an-Example-From-Indian-Farmers.pdf?origin=publication_detail

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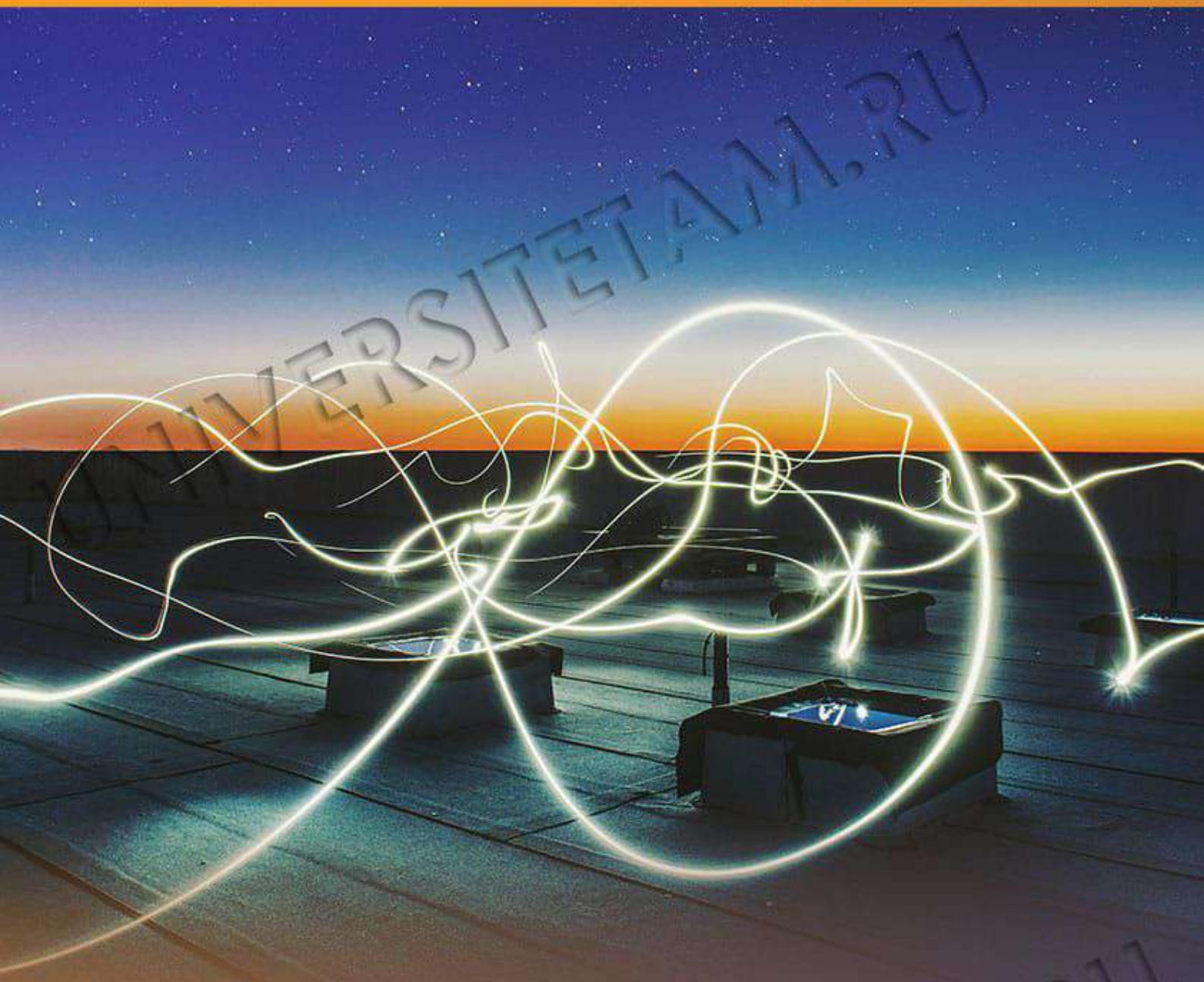

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UNIVERSITAS MUHAMMADIYAH MALANG

PREFACE: the 1st ICoN-BEAT 2019

On behalf of the organizing committee of the 1st International Conference on Bioenergy and Enviromentally Sustainable Agriculture Technology (ICoN-BEAT 2019) and conjunction with the 2nd Congress Indonesian Agriculture Private University Association (APTSIPI - *Asosiasi Perguruan Tinggi Swasta Ilmu Pertanian Indonesia*). It is an honor and delight to welcome all participants to this conference which be held at the Campus III, University of Muhammadiyah Malang (UMM), Indonesia on November 7th to 8th, 2019. The conference theme is "Bioenergy and Environmentally Sustainable Agriculture Technologies: Toward Food, Energy and Water Sovereignty".

This conference has been organized by Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang. Two main topics have been discussed, i.e. bioenergy and other renewable energy, and environmentally sustainable agriculture. We are perceived confidently that this conference will provide positive influence and contribute to develop the academic field.

Supporting two main topics, the 1st ICoN - BEAT invited five experts in the fields of energy, environment and agriculture from Indonesia, Malaysia, and Thailand. The speakers are Mr. Arfie Thahar (Research and Development Division of the Indonesian Palm Oil Plantation Fund Management Agency, Jakarta), Assoc. Prof. Dr. Maizirwan Mel (Department of Biotecnology Engineering, International Islam University, Malaysia), Asst. Prof. Dr. Khwunta Khwamee (Department of Earth Science, Faculty of Natural Resources, Price of Songkla University, Thailand), Mr. Paulus Tjakrawan (Executive Chairman of the Indonesian Biofuel Entrepreneurs Association, Jakarta), and Assoc. Prof. Dr. Tatang Hernas Soerawidjaja (Chairman of the Indonesian Bioenergy Association, Indonesian Research Council Commission, and Department of Chemical Engineering - Bandung Institute of Technology).

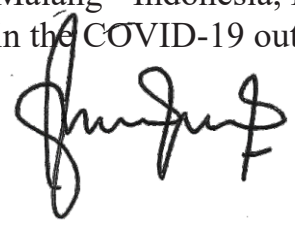
A pride because the number of participants who already send the paper about 116 presenters. After a rigorous selection process, the Scientific & Editorial Board of the 1st ICoN - BEAT 2019 decided to publish 51 papers in E3S Web of Conferences, an open-access proceedings in environment, energy and earth sciences, managed by EDP Sciences, Paris, France and indexed on Scopus, Scimago, Conference Proceedings Citation Index-Science (CPCI-S) of Clarivate Analytics's Web of Science, and DOAJ (Directory of Open Access Journals).

The Proceeding of the 1st ICoN - BEAT 2019, consists of 51 selected papers, amount 38 papers were the results of joint research by Indonesian and overseas scholars. In the collaboration research, 71 institutions were involved 20 of which were from abroad Indonesia. The overseas institutions are from: Australia, Austria, Czech, Estonia, Eswani, Georgia, Germany, India, Japan, Latvia, Lithuania, Madagascar, Malaysia, the Netherlands, P.R. China, Sweden, Taiwan - ROC, Thailand, the United Kingdom, and Uzbekistan. Each of the papers submitted in E3S Web of Conferences was reviewed by at least two experts using the double-blind system. The published papers have passed all necessary improvement requirements in accordance to the Web of Conferences standard, reviewer's comments, SI (*Système International d'Unités*), similarity tests by Turnitin program (with the highest threshold of 20 %), 90 % of references must be at least dated from 15 years, and reflected on Google, as well as editing procedure by professional editors from four countries (Estonia, Indonesia, Lithuania, and Malaysia).

Last but not least, I personally would like to thank you the official committees, organizing partners, and scientific & editorial board. Special thanks as well to our co-host partners: i) APTSIPI, ii) ILUNET (*Ikatan Alumni Energi Terbarukan*) University of Darma Persada, Jakarta, iii) Konsorsium Bioteknologi Indonesia, iv) Merdeka University of Madiun, v) University of Veteran Bangun Nusantara, Sukoharjo, vi) C- BIORE (Center of Biomass and Renewable Energy), vii) ITENAS (*Institut Teknologi Nasional*), viii) ILCAN (Indonesian Life Cycle Assessment Network), ix) *Rumah Paper Kita* as editing and proofreading services for supporting the 1st ICoN - BEAT 2019.

Finally, I would like to express my gratitude feeling for your participations, and please prepare yourself to gain the treasure of knowledge from the passionate experts. Then share the valuable enlightenment for a better future. It is my pleasure to see many of you in the 1st ICoN - BEAT 2019, and see you again in the 2nd ICoN - BEAT 2021.
Stay safe and stay healthy in COVID-19 pandemic.

With warmest regards
Malang - Indonesia, Dec 12, 2020
in the COVID-19 outbreak



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E3S Web of Conferences
Volume 226 (2021)
The 1st International Conference on Bioenergy and Environmentally Sustainable Agriculture Technology (ICoN BEAT 2019)
Malang, East Java, Indonesia, November 7-8, 2019

R. Hendroko Setyobudi, A. Winaya, J. Burlakovs, M. Mel and O. Anne (Eds.)

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Factors that Influence Farmer's Behavior Towards Risk

Muhamad Nurdin Yusuf*, *Agus* Yuniawan Isyanto, and *Sudradjat* Sudradjat

Department of Agribusiness, Faculty of Agriculture, Galuh University, Jl. R. E. Martadinata No.150, Ciamis 46274, Indonesia

Abstract. The research was carried out with the aim to find out the behavior of farmers towards risk and the factors that influence it. The research sample was 100 paddy farmers in flood-prone area paddy fields in Pangandaran District, West Java Province, Indonesia. Farmer's behavior towards risk was analyzed using quadratic utility functions, while the factors that influence farmer's behavior towards risk were analyzed using logistic regression. The results showed farmers 87 was risk neutral, while 13 farmer risk takers were farmers. Education, familys size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

Keywords: Land area, logistic regression, risk taker, quadratic utility.

1 Introduction

The impact of global climate change has an effect on paddy production in Indonesia in the form of flooding which results in crop failure or a decrease in paddy production [1]. Climate change has occurred in Indonesia with indications of an increase in temperature and changes in rainfall patterns. Agriculture is very vulnerable to the effects of climate change with an indication of the high level of danger in decreasing paddy production as a result of increasing temperatures and changes in rainfall patterns. The average decline in paddy production is 1.37 % yr^{-1} which has the potential to cause a decline in national food production [2].

The threat of flooding in paddy fields can lead to reduced harvest area and paddy production [3]. Production is related to the nature of farming which is always dependent on nature supported by risk factors [4]. The risk of failure in farming comes from the use of new technology, prices of agricultural production, capital, government policies and individual behavior of farmers in dealing with outsiders [5], as well as climate change and weather that are not in accordance with crop needs [6]. The main risks farming include flooding [7].

Farmer's behavior towards risk consists of risk averter, risk neutral, and risk taker. Farmer behavior is the basis of farmers' decision making in carrying out their farming [1]. Farmer's behavior towards risk has an important role in influencing the productivity of agricultural products which has an impact on production efficiency [8]. Factors that

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influence farmer behavior towards risk are the area of planting, age, education, experience, family size, income and productivity risk [8].

2 Research methodology

Amount ten villages in Padaherang and Kalipucang Subdistricts in Pangandaran District were taken purposively as a sample area with consideration of being areas that have flood-prone rice fields. From each village a sample of ten farmers was taken, so that the total number of samples was 100 farmers.
Farmer's behavior towards farming risk was analyzed using the quadratic utility Equation (1):

$$U = \tau_1 + \tau_2 M + \tau_3 M^2 \quad (1)$$

Where:
U : utility for expected income (in util)
τ_1 : intercept
M : expected income at the balance point (rupiah value from certainty equivalent (CE)
τ_2 : indifference income coefficient (CE)
τ_3 : farmer risk coefficient

The risk preference coefficient shows the farmer's attitude to risk, namely:
$\tau_3 = 0$: Risk neutral
$\tau_3 < 0$: Risk averse
$\tau_3 > 0$: Risk taker

The factors that influence farmers' behavior towards risk are analyzed using ordinal logit regression with the following Equation (2):

$$P_i = F(Y_i) = F(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_8 D_8 + \beta 9 D9 + \beta_{10} D) \quad (2)$$

Y_i values are calculated using the following Equation (3):

$$Y_i = Log\,[P_i/(1-P_i)] = (\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} D + e) \quad (3)$$

Where:

Y_i = Opportunities for farmers to make decisions, where:
Y_1 = 1 for the farmer who are risk averse
Y_2 = 2 for the farmer who are risk neutral
Y_3 = 3 for the farmer who are risk taker
α = Intercept
β_i = Parameter regression coefficient (i = 1, 2, 3,….10)
X_1 = Age (year)
X_2 = Education (year)
X_3 = Family size (person)
X_4 = Experience (year)
X_5 = Land area (ha)
X_6 = Farm income (IDR)
X_7 = Production risk
X_8 = Price risk
X_9 = Income risk
D = Membership in groups (1 if being a member of a group, 0 if not)
e = error term

3 Results and discussion

3.1 Farmer's behavior towards risk

Farmer's behavior towards risk in paddy farming in flood-prone paddy fields can be seen in Table 1.

Table 1. Farmer's behavior towards risk

Farmer's behavior towards risk	Number of people	Percentage
Risk Neutral	87	87.00
Risk Taker	13	13.00
Total	100	100.00

Table 1 shows that most farmers (87 %) are risk neutral, while the rest (13 %) are risk takers. There are no risk averse farmers. According to [9], the absence of risk avers farmers show that there are no farmers who are willing to sacrifice their income or potential income to reduce opportunities for loss or low income. According to [1], farmers will try to avoid failure and not get big profits by taking risks. Such behavior is called safety first, which is characteristic of most farmers.

Farmers who are risk neutral are farmers who have a rational attitude in facing risks [9]. Risk neutral farmers tend to cultivate based on hereditary habits. They only seek income that can meet their family's needs [10]. If there is additional capital for risk neutral farmers, then they might add input to get higher income [11]. The availability of capital for farmers is a risk factor that is considered to affect farmers to the farming they are doing [12].

Risk taker farmers are farmers who are willing to allocate and use their production factors to the maximum, even though there are risks that must be faced with the aim of obtaining optimal results. [8] states that conceptually farmers are able to reduce production risk and price risk by improving their productivity, the use of diversification, the use of appropriate cropping patterns, strengthening farmer institutions, and bargaining position of farmers can increase farmers' production and income [7].

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Income risk does not significantly influence farmer behavior towards risk. The higher the income risk faced by farmers, the more farmers will behave neutrally against risk. Membership in groups does not significantly influence farmers' behavior towards risk. According to [19], group membership is one of the efforts of farmers to reduce the risk of farming by cooperating with each other, exchanging information in managing their farming with fellow farmers.

4 Conclusion

Amount 87 farmers are risk neutral and 13 farmers are risk takers. Education, family size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

References

1. C. Gardebroek, M.D. Chavez, A.O. Lansink, J. Agric. Econ. **61**,1:60–75(2010). https://doi.org/10.1111/j.1477-9552.2009.00222.x
2. Ruminta, Handoko, T. Nurmala. Jurnal Agro. **5**,1:48–60(2018). [in Bahasa Indonesia]. https://journal.uinsgd.ac.id/index.php/ja/article/download/1607/pdf_16
3. Shahab. E. Saqib, Mokbul. M. Ahmad, Sanaullah. P, Irfan. A Rana, Int. J. Disaster Risk Reduc. **18:**107–114(2016). https://www.researchgate.net/profile/Shahab_E_Saqib/publication/304305997_An_Empirical_Assessment_of_Farmers%27_Risk_Attitudes_in_Flood-Prone_Areas_of_Pakistan/links/5bf55cd2299bf1124fe32898/An-Empirical-Assessment-of-Farmers-Risk-Attitudes-in-Flood-Prone-Areas-of-Pakistan.pdf?origin=publication_detail
4. C. Gardebroek, Eur. Rev. Agric. Econ. **33**,4:485–510(2006). https://doi.org/10.1093/erae/jbl029
5. M.P. Lucas, I.M. Pabuayon., Asian J. Agric. Dev. **8**,2:61–77(2011). https://tind-customer-agecon.s3.amazonaws.com/9fdd6f1e-7e97-4413-a5f2-ffb38a8fea0c?response-content-disposition=attachment%3B%20filename%2A%3DUTF-8%27%27AJAD_2011_8_2_5Lucas.pdf&response-content-type=application%2Fpdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Expires=86400&X-Amz-Credential=AKIAXL7W7Q3XHXDVDQYS%2F20200908%2Feu-west-1%2Fs3%2Faws4_request&X-Amz-SignedHeaders=host&X-Amz-Date=20200908T165030Z&X-Amz-Signature=20ca172c04b02c087149aa1ba32cc86309bf574faede65f1910b98ade0e76e34
6. T. Tiedemann, U.L. Lohman, J. Agric. Econ. **64**,1:73–96(2012). https://doi.org/10.1111/j.1477-9552.2012.00364.x
7. J.N. Nmadu, G.P. Eze, A.J. Jirgi. British J. Econ. Manag. Trade, **2,**2:92–108(2012). https://www.journaljemt.com/index.php/JEMT/article/download/30022/56339
8. R. Darma, T.N.A. Rahmadanih, R. Amandaria. Int. J. Agric. Syst. **2**,1:77–89(2014). http://pasca.unhas.ac.id/ojs/index.php/ijas/article/download/24/23
9. E.D. Oruonye, IJFSE. **3**,4:113–117(2013). http://www.ijfse.com/uploadedfiles/IJFSEArchive/IJFSE2013/3(4)/01.pdf
10. M.C. Plaxedes, P. Mafongoya, Clim. Risk Manag. **16**:145–163(2017). https://doi.org/10.1016/j.crm.2017.02.001

11. Y. Ferrianta, M.F. Makki, Suprijanto, Rifiana. Int. J. Agric. Manag. Dev. **5**,2:133–139(2014). https://www.researchgate.net/publication/272667859_Risk_Analysis_and_Strategy_of_Rice_Farmers_in_Swampland_in_the_Face_of_Climate_Change_Impact_Case_in_South_Kalimantan_Province-Indonesia/fulltext/57a79def08aee07544c1d003/Risk-Analysis-and-Strategy-of-Rice-Farmers-in-Swampland-in-the-Face-of-Climate-Change-Impact-Case-in-South-Kalimantan-Province-Indonesia.pdf?origin=publication_detail
12. A.D. Brauw, P. Eozenou. J. Dev. Econ. **111:**61–74(2014). https://www.researchgate.net/profile/Patrick_Eozenou/publication/266617635_Measuring_risk_attitudes_among_Mozambican_farmers/links/5435ad990cf2643ab9867e0d/Measuring-risk-attitudes-among-Mozambican-farmers.pdf?origin=publication_detail
13. C.A. Kalu, J.A. Mbanasor. NAPReJ, **1**,1:1–10(2016). https://econpapers.repec.org/scripts/redir.pf?u=https%3A%2F%2Fdoi.org%2F10.22004%252Fag.econ.292052;h=repec:ags:naprej:292052
14. M.M. Haque, S. Bremer, S. Aziz, J.P. Sluijs, Clim. Risk Manag. **16:**43–58(2017). https://dx.doi.org/10.1016/j.crm.2016.12.002
15. S. Dadzie, N. Kwesi, H. de Graft. A, Int. J. Agric. For. **2**,2:29–37(2012). https://www.researchgate.net/profile/Samuel_Dadzie/publication/241699647_Attitudes_Toward_Risk_and_Coping_Responses_The_Case_of_Food_Crop_Farmers_at_Agona_Duakwa_in_Agona_East_District_of_Ghana/links/0046351caa436af152000000/Attitudes-Toward-Risk-and-Coping-Responses-The-Case-of-Food-Crop-Farmers-at-Agona-Duakwa-in-Agona-East-District-of-Ghana.pdf?origin=publication_detail
16. S.R. Fajri, E. Fauziyah. J. Hort. Indonesia, **9**,3:188–196(2018). [in Bahasa Indonesia] https://journal.ipb.ac.id/index.php/jhi/article/download/26496/17128/
17. C. Mulwa, P. Marenya, D.B. Rahut, M. Kassie, Clim. Risk Manag. **16**:208–221(2017). https://reader.elsevier.com/reader/sd/pii/S2212096317300062?token=8C6D3F91A4BEF28A0A8335A476A7B6B75EB4D84ED7742D9C358F0465D68675FD002D8C4A371BC054A01FAF3CD18289A8
18. A. Ali, O. Erenstein, Clim. Risk Manag. **16**:1–12(2017). https://www.researchgate.net/profile/Olaf_Erenstein/publication/311879490_Assessing_farmer_use_of_climate_change_adaptation_practices_and_impacts_on_food_security_and_poverty_in_Pakistan/links/58b71affaca27261e51a4134/Assessing-farmer-use-of-climate-change-adaptation-practices-and-impacts-on-food-security-and-poverty-in-Pakistan.pdf?origin=publication_detail
19. A. Tripathi, A.K. Mishra. Clim. Risk Manag. **16**:1–37(2017). https://www.researchgate.net/publication/310815962_Knowledge_And_Passive_Adaptation_to_Climate_Change_an_Example_From_Indian_Farmers/fulltext/583a4d6308ae3a74b49ea7e4/Knowledge-And-Passive-Adaptation-to-Climate-Change-an-Example-From-Indian-Farmers.pdf?origin=publication_detail

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e3sconf_icon-beat2019_00030.pdf

WORD COUNT

2592 Words

CHARACTER COUNT

14492 Characters

PAGE COUNT

6 Pages

FILE SIZE

186.1KB

SUBMISSION DATE

Apr 4, 2023 12:37 PM GMT+7

REPORT DATE

Apr 4, 2023 12:37 PM GMT+7

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Factors that Influence Farmer's Behavior Towards Risk

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Abstract. The research was carried out with the aim to find out the behavior of farmers towards risk and the factors that influence it. The research sample was 100 paddy farmers in flood-prone area paddy fields in Pangandaran District, West Java Province, Indonesia. Farmer's behavior towards risk was analyzed using quadratic utility functions, while the factors that influence farmer's behavior towards risk were analyzed using logistic regression. The results showed farmers 87 was risk neutral, while 13 farmer risk takers were farmers. Education, familys size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

Keywords: Land area, logistic regression, risk taker, quadratic utility.

1 Introduction

The impact of global climate change has an effect on paddy production in Indonesia in the form of flooding which results in crop failure or a decrease in paddy production [1]. Climate change has occurred in Indonesia with indications of an increase in temperature and changes in rainfall patterns. Agriculture is very vulnerable to the effects of climate change with an indication of the high level of danger in decreasing paddy production as a result of increasing temperatures and changes in rainfall patterns. The average decline in paddy production is 1.37 % yr^{-1} which has the potential to cause a decline in national food production [2].

The threat of flooding in paddy fields can lead to reduced harvest area and paddy production [3]. Production is related to the nature of farming which is always dependent on nature supported by risk factors [4]. The risk of failure in farming comes from the use of new technology, prices of agricultural production, capital, government policies and individual behavior of farmers in dealing with outsiders [5], as well as climate change and weather that are not in accordance with crop needs [6]. The main risks farming include flooding [7].

Farmer's behavior towards risk consists of risk averter, risk neutral, and risk taker. Farmer behavior is the basis of farmers' decision making in carrying out their farming [1]. Farmer's behavior towards risk has an important role in influencing the productivity of agricultural products which has an impact on production efficiency [8]. Factors that

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influence farmer behavior towards risk are the area of planting, age, education, experience, family size, income and productivity risk [8].

2 Research methodology

Amount ten villages in Padaherang and Kalipucang Subdistricts in Pangandaran District were taken purposively as a sample area with consideration of being areas that have flood-prone rice fields. From each village a sample of ten farmers was taken, so that the total number of samples was 100 farmers.
Farmer's behavior towards farming risk was analyzed using the quadratic utility Equation (1):

$$U = \tau_1 + \tau_2 M + \tau_3 M^2 \quad (1)$$

Where:
U : utility for expected income (in util)
τ_1 : intercept
M : expected income at the balance point (rupiah value from certainty equivalent (CE)
τ_2 : indifference income coefficient (CE)
τ_3 : farmer risk coefficient

The risk preference coefficient shows the farmer's attitude to risk, namely:
$\tau_3 = 0$: Risk neutral
$\tau_3 < 0$: Risk averse
$\tau_3 > 0$: Risk taker

The factors that influence farmers' behavior towards risk are analyzed using ordinal logit regression with the following Equation (2):

$$P_i = F(Y_i) = F(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_8 D_8 + \beta 9 D9 + \beta_{10} D) \quad (2)$$

Y_i values are calculated using the following Equation (3):

$$Y_i = Log\,[P_i/(1-P_i)] = (\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} D + e) \quad (3)$$

Where:

Y_i = Opportunities for farmers to make decisions, where:
Y_1 = 1 for the farmer who are risk averse
Y_2 = 2 for the farmer who are risk neutral
Y_3 = 3 for the farmer who are risk taker
α = Intercept
β_i = Parameter regression coefficient (i = 1, 2, 3,….10)
X_1 = Age (year)
X_2 = Education (year)
X_3 = Family size (person)
X_4 = Experience (year)
X_5 = Land area (ha)
X_6 = Farm income (IDR)
X_7 = Production risk
X_8 = Price risk
X_9 = Income risk
D = Membership in groups (1 if being a member of a group, 0 if not)
e = error term

3 Results and discussion

3.1 Farmer's behavior towards risk

Farmer's behavior towards risk in paddy farming in flood-prone paddy fields can be seen in Table 1.

Table 1. Farmer's behavior towards risk

Farmer's behavior towards risk	Number of people	Percentage
Risk Neutral	87	87.00
Risk Taker	13	13.00
Total	100	100.00

Table 1 shows that most farmers (87 %) are risk neutral, while the rest (13 %) are risk takers. There are no risk averse farmers. According to [9], the absence of risk avers farmers show that there are no farmers who are willing to sacrifice their income or potential income to reduce opportunities for loss or low income. According to [1], farmers will try to avoid failure and not get big profits by taking risks. Such behavior is called safety first, which is characteristic of most farmers.

Farmers who are risk neutral are farmers who have a rational attitude in facing risks [9]. Risk neutral farmers tend to cultivate based on hereditary habits. They only seek income that can meet their family's needs [10]. If there is additional capital for risk neutral farmers, then they might add input to get higher income [11]. The availability of capital for farmers is a risk factor that is considered to affect farmers to the farming they are doing [12].

Risk taker farmers are farmers who are willing to allocate and use their production factors to the maximum, even though there are risks that must be faced with the aim of obtaining optimal results. [8] states that conceptually farmers are able to reduce production risk and price risk by improving their productivity, the use of diversification, the use of appropriate cropping patterns, strengthening farmer institutions, and bargaining position of farmers can increase farmers' production and income [7].

3.2 Factors that influence farmer's behavior toward risk

The results of the analysis of factors that influence farmer behavior on risk in paddy farming in flood-prone paddy fields can be seen in Table 2.

Table 2. Factors that influence farmer's behavior towards risk

Variabel	B	Wald	Exp(B)
Age	0.788	0.020	2.199
Education	7.139	3.452**	1.260E3
Family size	4.983	4.303*	145.958
Experience	-0.149	0.003	0.861
Land area	0.687	0.279	1.988
Farm income	2.896	4.313*	18.103

(Continued on next page)

Table 2. Continued

Variabel	**B**	**Wald**	**Exp(B)**
Production risk	1.029	0.407	2.799
Price risk	-0.834	1.016	0.434
Income risk	-0.134	0.014	0.875
Group	1.795	0.946	6.020
Constant	-69.854	3.703**	0.000
Model Summary			
-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square	Chi-square
19.158	0.441	0.819	18.307*

*,** = significant at 5 %, 10 %

Table 2 shows that age is not significant influence farmers' behavior towards risk. This shows that the difference in age of farmers does not affect the behavior of farmers in dealing with risk. Education significantly influences farmer's behavior towards risk. The results of this study are in accordance with the results of research from [13]. The higher the level of education of farmers, the more courageous farmers face risks [5, 7]. According to [13], the level of education of farmers who are still low makes the main cause of the majority of farmers who choose safety first (zero risk) behavior in developing their farming.

Family size significantly influences farmer's behavior towards risk. The results of this study are in accordance with the results of research by [14]. According to [9], family size affects the outpouring of time that can be allocated for farming. According to [14], the more number of members of the farmer's family, the higher the capacity of the workforce owned by the farmer in facing the risk.

Experience does not significantly influence farmers' behavior towards risk. The longer the farmer's experience, the more careful it will be in carrying out farming so that it tends to be more neutral to risk. The results of this study are in accordance with the results of research from [7].

Land area does not significantly affect farmer's behavior to risk. The results of this study are consistent with the results of a study from [5] which shows that the addition or reduction of land area will not reduce risk aversion or that farmers are neutral towards risk.

Revenue significantly influences farmer's behavior towards risk. The greater the income the farmer receives from the farming that is carried out, the farmer will be more courageous in accepting the risk. The results of this study are in accordance with the results of research from [8, 14, 5]. According to [8], the higher the farm income received by farmers, the farmers will be more willing to accept the risk.

Production risk does not significantly influence farmer's behavior towards risk. According to [7], the magnitude of the risk of production faced by farmers due to the uncertainty of results as a result of natural factors and income as a result of price fluctuations, causes farmers to tend to reject the possibility of accepting the risks and uncertainties of the business. According to [15], efforts to handle production risk can be done by implementing a diversification and agricultural insurance program.

Price risk does not significantly influence farmer's behavior towards risk. According to [16], farmers' household attitudes in carrying out production activities can be seen from variations in prices as a measure of price risk. According to [17], the behavior of farmers who accept price risk is caused by the expectation of expected price reductions compared to the actual prices that make farmers continue to carry out farming as long as they provide benefits. According to [18], the behavior of farmers does not dare to risk due to fluctuations

in production and selling prices which will have an impact on farmers' income.

Income risk does not significantly influence farmer behavior towards risk. The higher the income risk faced by farmers, the more farmers will behave neutrally against risk. Membership in groups does not significantly influence farmers' behavior towards risk. According to [19], group membership is one of the efforts of farmers to reduce the risk of farming by cooperating with each other, exchanging information in managing their farming with fellow farmers.

4 Conclusion

Amount 87 farmers are risk neutral and 13 farmers are risk takers. Education, family size and income significantly influence farmer's behavior towards risk; while age, experience, land area, production risk, price risk, income risk and group did not significantly influence farmer's behavior towards risk.

References

1. C. Gardebroek, M.D. Chavez, A.O. Lansink, J. Agric. Econ. **61**,1:60–75(2010). https://doi.org/10.1111/j.1477-9552.2009.00222.x
2. Ruminta, Handoko, T. Nurmala. Jurnal Agro. **5**,1:48–60(2018). [in Bahasa Indonesia]. https://journal.uinsgd.ac.id/index.php/ja/article/download/1607/pdf_16
3. Shahab. E. Saqib, Mokbul. M. Ahmad, Sanaullah. P, Irfan. A Rana, Int. J. Disaster Risk Reduc. **18:**107–114(2016). https://www.researchgate.net/profile/Shahab_E_Saqib/publication/304305997_An_Empirical_Assessment_of_Farmers%27_Risk_Attitudes_in_Flood-Prone_Areas_of_Pakistan/links/5bf55cd2299bf1124fe32898/An-Empirical-Assessment-of-Farmers-Risk-Attitudes-in-Flood-Prone-Areas-of-Pakistan.pdf?origin=publication_detail
4. C. Gardebroek, Eur. Rev. Agric. Econ. **33**,4:485–510(2006). https://doi.org/10.1093/erae/jbl029
5. M.P. Lucas, I.M. Pabuayon., Asian J. Agric. Dev. **8**,2:61–77(2011). https://tind-customer-agecon.s3.amazonaws.com/9fdd6f1e-7e97-4413-a5f2-ffb38a8fea0c?response-content-disposition=attachment%3B%20filename%2A%3DUTF-8%27%27AJAD_2011_8_2_5Lucas.pdf&response-content-type=application%2Fpdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Expires=86400&X-Amz-Credential=AKIAXL7W7Q3XHXDVDQYS%2F20200908%2Feu-west-1%2Fs3%2Faws4_request&X-Amz-SignedHeaders=host&X-Amz-Date=20200908T165030Z&X-Amz-Signature=20ca172c04b02c087149aa1ba32cc86309bf574faede65f1910b98ade0e76e34
6. T. Tiedemann, U.L. Lohman, J. Agric. Econ. **64**,1:73–96(2012). https://doi.org/10.1111/j.1477-9552.2012.00364.x
7. J.N. Nmadu, G.P. Eze, A.J. Jirgi. British J. Econ. Manag. Trade, **2,**2:92–108(2012). https://www.journaljemt.com/index.php/JEMT/article/download/30022/56339
8. R. Darma, T.N.A. Rahmadanih, R. Amandaria. Int. J. Agric. Syst. **2**,1:77–89(2014). http://pasca.unhas.ac.id/ojs/index.php/ijas/article/download/24/23
9. E.D. Oruonye, IJFSE. **3**,4:113–117(2013). http://www.ijfse.com/uploadedfiles/IJFSEArchive/IJFSE2013/3(4)/01.pdf
10. M.C. Plaxedes, P. Mafongoya, Clim. Risk Manag. **16**:145–163(2017). https://doi.org/10.1016/j.crm.2017.02.001

11. Y. Ferrianta, M.F. Makki, Suprijanto, Rifiana. Int. J. Agric. Manag. Dev. **5**,2:133–139(2014). https://www.researchgate.net/publication/272667859_Risk_Analysis_and_Strategy_of_Rice_Farmers_in_Swampland_in_the_Face_of_Climate_Change_Impact_Case_in_South_Kalimantan_Province-Indonesia/fulltext/57a79def08aee07544c1d003/Risk-Analysis-and-Strategy-of-Rice-Farmers-in-Swampland-in-the-Face-of-Climate-Change-Impact-Case-in-South-Kalimantan-Province-Indonesia.pdf?origin=publication_detail
12. A.D. Brauw, P. Eozenou. J. Dev. Econ. **111:**61–74(2014). https://www.researchgate.net/profile/Patrick_Eozenou/publication/266617635_Measuring_risk_attitudes_among_Mozambican_farmers/links/5435ad990cf2643ab9867e0d/Measuring-risk-attitudes-among-Mozambican-farmers.pdf?origin=publication_detail
13. C.A. Kalu, J.A. Mbanasor. NAPReJ, **1**,1:1–10(2016). https://econpapers.repec.org/scripts/redir.pf?u=https%3A%2F%2Fdoi.org%2F10.22004%252Fag.econ.292052;h=repec:ags:naprej:292052
14. M.M. Haque, S. Bremer, S. Aziz, J.P. Sluijs, Clim. Risk Manag. **16:**43–58(2017). https://dx.doi.org/10.1016/j.crm.2016.12.002
15. S. Dadzie, N. Kwesi, H. de Graft. A, Int. J. Agric. For. **2**,2:29–37(2012). https://www.researchgate.net/profile/Samuel_Dadzie/publication/241699647_Attitudes_Toward_Risk_and_Coping_Responses_The_Case_of_Food_Crop_Farmers_at_Agona_Duakwa_in_Agona_East_District_of_Ghana/links/0046351caa436af152000000/Attitudes-Toward-Risk-and-Coping-Responses-The-Case-of-Food-Crop-Farmers-at-Agona-Duakwa-in-Agona-East-District-of-Ghana.pdf?origin=publication_detail
16. S.R. Fajri, E. Fauziyah. J. Hort. Indonesia, **9**,3:188–196(2018). [in Bahasa Indonesia] https://journal.ipb.ac.id/index.php/jhi/article/download/26496/17128/
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18. A. Ali, O. Erenstein, Clim. Risk Manag. **16**:1–12(2017). https://www.researchgate.net/profile/Olaf_Erenstein/publication/311879490_Assessing_farmer_use_of_climate_change_adaptation_practices_and_impacts_on_food_security_and_poverty_in_Pakistan/links/58b71affaca27261e51a4134/Assessing-farmer-use-of-climate-change-adaptation-practices-and-impacts-on-food-security-and-poverty-in-Pakistan.pdf?origin=publication_detail
19. A. Tripathi, A.K. Mishra. Clim. Risk Manag. **16**:1–37(2017). https://www.researchgate.net/publication/310815962_Knowledge_And_Passive_Adaptation_to_Climate_Change_an_Example_From_Indian_Farmers/fulltext/583a4d6308ae3a74b49ea7e4/Knowledge-And-Passive-Adaptation-to-Climate-Change-an-Example-From-Indian-Farmers.pdf?origin=publication_detail

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