RESEARCH ARTICLE

REVISED Comparison of tillage costs among eight paddy farm regions in East Kalimantan, Indonesia [version 2; peer review: 2 approved]

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Abstract

Background: Tillage is done to prepare land for wetland paddy farming, and it is commonly done by hand tractor. The purposes of this study were to identify the levels of ownership of hand tractor by paddy farmers, to describe the rental of hand tractor in rural areas, to calculate and compare the tillage costs on eight paddy farm regions, and to understand the utilization of farm machinery for paddy farming in East Kalimantan, Indonesia.

Methods: The study areas were Subcities/Subregencies of North Bontang, South Bontang, Muara Muntai, Loa Janan, Tenggarong Seberang, Waru, Penajam, and Babulu. Data collection was done by interviewing 380 respondents. Analysis of data used descriptive statistics, the Chi Square One Sample test, and One Way Anova.

Results: The number of hand tractor renters (87.37%) in East Kalimantan 2014 was bigger than that of hand tractor owners (12.63%). The tillage costs in Tenggarong Seberang, Loa Janan, and Muara Muntai in 2014 were USD48.56 ha⁻¹, USD52.03 ha⁻¹, and USD48.56 ha⁻¹, respectively. Tillage costs were the same in Babulu, Penajam, Waru, South Bontang, and North Bontang (USD69.37 ha⁻¹ in each regency).

Conclusions: There are very significant differences the number of hand tractor owners, the number of hand tractor renters, and the tillage costs among some regions in East Kalimantan, Indonesia. Farm machinery is needed in development of paddy farming.

Keywords

Cost, East Kalimantan, land, paddy farm, tillage.

Open Peer Review

Approval Status

	1	2
version 2 (revision) 07 May 2021		 view
version 1 19 Dec 2018	 view	 view

1. **Ahmad Shuib**, University Putra

Malaysia (UPM), Seri Kembangan, Malaysia

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Any reports and responses or comments on the article can be found at the end of the article.

This article is included in the **Agriculture, Food and Nutrition** gateway.

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Author roles: **Karmini K:** Investigation, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; **Karyati K:** Formal Analysis, Investigation, Methodology, Supervision, Writing – Review & Editing

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REVISED Amendments from Version 1

The author's revision for reviews by Reviewer 1 and Reviewer 2.

Author

Additional second author.

Affiliation

Additional affiliation of second author.

Abstract

Revision in subsections of Methods, Results, and Conclusions.

Additional methods to analyze data and the analysis results in subsections of Methods and Conclusions.

Methods

Additional the reasons of selecting study areas and references in subsection of Study area.

Additional method to determine the sample size and to select samples from population, and enumerators in subsection of Subject recruitment.

Additional method to analyze data and references in subsection of Statistical analysis.

Revision in subsections of Study area, Subject recruitment, and Statistical analysis.

Results and discussion

Additional the results of data analysis and table in subsections of Characteristics of respondents, Hand tractor ownership, Hand tractor renter, and Tillage cost.

Revision in subsections of Characteristics of respondents, Hand tractor ownership, Hand tractor renter, and Tillage cost.

Conclusions

Additional the results analysis and recommendations.

Revisions the results of data analysis.

References

Additional references.

Any further responses from the reviewers can be found at the end of the article

Introduction

Wetland paddy farming in East Kalimantan is a method of modern farming in which paddy farmers commonly by using hand tractor in land preparation. Tillage cost has important role in cost structure of paddy farming. The tillage cost can vary significantly, and negatively affects paddy farm income in East Kalimantan, Indonesia (Karmini, 2017). The increase of tillage cost leads the increase of production cost of paddy farming and the decrease of paddy farm income and household income of paddy farmers. This is supported by the research result of Larson & Plessmann (2009).

Wetland paddy farming is done in most regions in East Kalimantan. Information is needed about the tillage cost in different paddy farm areas to formulate policy on farm machinery utilization in specific areas containing paddy farms. The purposes of this study were to identify the ownership of hand tractor by paddy farmers, to describe the rental of hand tractors

in rural areas, to calculate and compare the tillage costs on eight paddy farm regions, and to know the machinery utilization for paddy farming in East Kalimantan, Indonesia. The hypotheses of this study were that there are no significant differences the number of hand tractor owners, the number of hand tractor renters, and the tillage costs among the eight paddy farm regions in East Kalimantan, Indonesia.

Methods

Study area

This study was held from November 2013 to April 2014 in Province of East Kalimantan, Republic of Indonesia. Paddy farmer income in East Kalimantan lower than that in West Kalimantan and South Kalimantan (Statistics Indonesia, 2008) and paddy productivity in East Kalimantan lower than that in South Kalimantan and the average in Indonesia (Statistics East Kalimantan, 2009). The determination of study areas based on two-stage clustered sampling. The study areas were Bontang City (North Bontang and South Bontang), Kutai Kartanegara Regency (Muara Muntai, Loa Janan, and Tenggarong Seberang), and Penajam Paser Utara Regency (Waru, Penajam, and Babulu).

Subject recruitment

The overall population in the areas examined in this study was 36,970 households of paddy farmers. The minimum sample size for populations of 20,000 and 50,000 people is 377 and 382, respectively (Rea & Parker, 1997). The sample size used in this study was therefore 380 respondents. The determination of the number of samples in each study areas was based on proportional sampling. Based on data of the number of paddy household each region (Statistics East Kalimantan, 2009) multiplied by the total sample then divided by total paddy household in eight regions, it was known the sample size in North Bontang (24; 1), South Bontang (120; 2), Muara Muntai (206; 4), Loa Janan (1,002; 17), Tenggarong Seberang (7,388; 128), Waru (908; 16), Penajam (4,829; 84), and Babulu (7,343; 128).

Random sampling was applied in selecting samples. Farmers who met the inclusion and exclusion criterias had equal probability to be chosen as samples. Inclusion criterias for samples were farmers who are currently engaged in wetland paddy farming, lived minimum 5 years in study area, and had experience continuously minimum 2 years cultivate paddy. Exclusion criterias for samples were lived less than 5 years in study area and had experience less than 2 years cultivate paddy but farmers have own land or become labors. The random number method assigned every sample a number, then randomly picked samples by using a table of random numbers. The researchers employed the enumerators to help the interviews process. The researchers and enumerators went to paddy field and met with potential respondents in person, then provided information on the purposes of study and the right of them to not answer the questions at any time and assured that the data would be kept confidential and only aggregate data would be used. After they gave the consent to be interviewed, they were given the choice to decide the place for the interviews using the questionnaire (Karmini, 2018), either at home or other places which were convenient for them. The researchers,

enumerators, and respondents discussed directly at the same place. This study was approved by Head of Department of Agribusiness, Faculty of Agriculture, University of Mulawarman (Tetty Wijayanti, SP, MP; approval number 2104/UN17.3/TU/2013). Each participant gave their written informed consent to participate in the study.

Statistical analysis

This study performed analysis by using the software of IBM SPSS Statistics 24. Descriptive statistics was applied to count frequency, total, percentage, maximum, and minimum. Tested hypotheses used the Chi Square One Sample and One Way Anova with $\alpha = 0.01$ and [Pobhirun & Pinitsoontorn \(2019\)](#) and [Ogunbanwo et al. \(2019\)](#) reported the socio-demographic data by using descriptive statistics and analysed hypotheses with Chi Square test. The exchange rate of 1 USD was 14,415.25 IDR on 28 March 2021.

Results and discussion

Characteristics of respondents

All 380 respondents completed the questionnaire in full (Extended data). From our study, we observed that the most of paddy farmers in East Kalimantan, Indonesia, are typically male (95.53%), married (93.42%), 4–6 members in their household (52.63%), and are Javanese (93.16%), have 1–2 ha paddy farm size (58.95%), handtractor renter (87.37%), buying price of handtractor between USD1,001.00 – USD1,500.00 unit⁻¹ (7.63%), and rent cost of handtractor between USD51.00 – USD100.00 (33.42%) ([Table 1](#) and Underlying data).

Hand tractor ownership

A small number of paddy households had the ability to buy hand tractor in the study areas (12.63%) ([Table 2](#)). There are very significant differences the number of hand tractor owners among the five paddy farm regions (Loa Janan, Tenggarong Seberang, Waru, Penajam, and Babulu) in East Kalimantan, Indonesia ($\chi^2_{\text{calculated}} = 20.96 > \chi^2_{\text{table df} = 4; \alpha = 0.01} = 13.28$; $p\text{-value} = 0.0003 < \alpha = 0.01$). [Narayanamoorthy et al. \(2014\)](#) found that the factors such as coverage of irrigation, yield enhancing inputs cost, land-labor ratio, and human labor use in man-hours have significantly influence the use of machine labor in paddy cultivation.

Hand tractor renters

Farmers who did not own a hand tractor (87.37%) could rent from the owners of hand tractor who live in the same village or from nearby village ([Table 3](#)). There are very significant differences the number of hand tractor renters among the eight paddy farm regions in East Kalimantan, Indonesia ($\chi^2_{\text{calculated}} = 429.45 > \chi^2_{\text{table df} = 7; \alpha = 0.01} = 18.48$; $p\text{-value} = 1.15 \times 10^{-88} < \alpha = 0.01$). This was reasonable, because owning a hand tractor is very costly. Hand tractor prices ranged from USD 416.23 unit⁻¹ to USD1,734.27 unit⁻¹.

Tillage cost

Farm size varies among paddy farming households in all regions (0.25–5.00 ha). Small land-holding farmers in the study areas did not have constraints to rent and use of hand tractors because the wetland fields for the most part are located in same area. However, [Hristova & Maddock \(1993\)](#) mentioned that land size could be a constraint in applying mechanized farming. The proportion of machine labour costs (11.13%) of total cost of cultivation of borewell irrigated paddy in Tumakuru District, India ([Hamsa et al., 2017](#)).

The tillage costs ([Table 4](#)) in Tenggarong Seberang and Muara Muntai were lower than those in Loa Janan. Tillage costs were same in other five regions. The amount of hand tractor rental cost at the research location includes machine rental cost, machine maintenance cost, and operator wage. Limitations of the study, such as limited access to several study areas which more time was needed to collect data, influenced the diversity of respondents and data. There are very significant differences the tillage costs among Bontang, Kutai Kartanegara, and Penajam Paser Utara in East Kalimantan, Indonesia ($F_{\text{calculated}} = 39,236.54 > F_{\text{table dfn} = 2; \text{dfd} = 377; \alpha = 0.01} = 8.88$; $p\text{-value} = 0.00 < \alpha = 0.01$). The difference of tillage costs could be happened because of the difference of buying price of machine, operator wage, and machine maintenance cost.

Farm machinery

Hand tractor usage is still recommended for the development of paddy farming as an important physical asset in paddy farming. The number of hand tractors in rural areas could be increased, either through purchase by paddy farmers or by grants from government, to decrease the tillage cost and production cost, thus increasing income of paddy farming and paddy farmers.

Conclusions

The number of paddy households as hand tractor owners and hand tractor renters in East Kalimantan in 2014 were 12.63% and 87.37%, respectively. The tillage cost was between USD48.56 ha⁻¹ and USD69.37 ha⁻¹. There are very significant differences the number of hand tractor owners among Loa Janan, Tenggarong Seberang, Waru, Penajam, and Babulu and the number of hand tractor renters among the eight paddy farm regions in East Kalimantan, Indonesia. There are very significant differences the tillage costs among Bontang, Kutai Kartanegara, and Penajam Paser Utara in East Kalimantan, Indonesia. Those might be caused the difference of paddy farmers number, labor availability, farming costs, farmer prosperity, land ownership, paddy farm size, hand tractor price, operator wage, and hand tractor maintenance cost among regions. Farm machinery is required to develop the paddy farming. Bontang and Penajam Paser Utara are the recommended regions for the activities in relation to increase the ownership of hand

Table 1. Respondents' socioeconomic-demographic characteristics.

No.	Characteristics	Level/Category	Frequency (respondent)										Total	Percentage (%)
			Bontang City		Kutai Kartanegara Regency			Penajam Paser Utara Regency						
			North Bontang	South Bontang	Muara Muntai	Loa Janan	Tenggarong Seberang	Waru	Penajam	Babulu				
1	Residence	Subcity/subregency	1	2	4	17	128	16	84	128	380	100.00		
2	Gender	Male	1	2	4	16	128	13	79	120	363	95.53		
		Female	-	-	-	1	-	3	5	8	17	4.47		
3	Marital status	Married	1	2	4	17	125	15	79	112	355	93.42		
		Single	-	-	-	-	3	-	-	-	3	0.79		
		Divorced	-	-	-	-	-	-	3	9	12	3.16		
		Widow	-	-	-	-	-	1	2	7	10	2.63		
4	Members of household	1-3 person	1	-	-	8	51	3	33	76	172	45.26		
		4-6 person	-	2	3	9	77	10	47	52	200	52.63		
		7-9 person	-	-	1	-	-	2	4	-	7	1.84		
		10 person	-	-	-	-	-	1	-	-	1	0.26		
5	Ethnicity	Javanese	-	-	-	17	122	14	82	119	354	93.16		
		Sundanese	-	-	-	-	-	-	-	7	7	1.84		
		Kutainese	-	-	3	-	3	-	-	-	6	1.58		
		Banjarnese	-	-	1	-	-	1	-	2	4	1.05		
		Bugisnese	1	2	-	-	3	1	2	-	9	2.37		
6	Paddy farm size	< 1,00 ha	1	1	3	9	54	5	38	10	121	31.84		
		1,00-2,00 ha	-	1	1	8	69	8	43	94	224	58.95		
		2,10-3,00 ha	-	-	-	-	5	3	2	16	26	6.84		
		> 3,00 ha	-	-	-	-	-	-	1	8	9	2.37		
7	Handtractor ownership	Owner	-	-	-	2	17	4	17	8	48	12.63		
		Renter	1	2	4	15	111	12	67	120	332	87.37		

No.	Characteristics	Level/Category	Frequency (respondent)										Total	Percentage (%)
			Bontang City		Kutai Kartanegara Regency			Penajam Paser Utara Regency						
					North Bontang	South Bontang	Muara Muntai	Loa Janan	Tenggarong Seberang	Waru	Penajam	Babulu		
8	Buying price of handtractor	<USD500.00 unit ¹	-	-	-	-	-	-	-	-	1	1	0.26	
		USD501.00 - USD1,000.00 unit ¹	-	-	-	2	11	-	3	-	16	16	4.21	
		USD1,001.00 - USD1,500.00 unit ¹	-	-	-	-	6	3	13	7	29	29	7.63	
		USD1,501.00 - USD2,000.00 unit ¹	-	-	-	-	-	1	1	-	2	2	0.53	
9	Rent cost of handtractor	< USD50.00	1	1	3	9	74	5	27	5	125	125	32.89	
		USD51.00 - USD100.00	-	1	1	6	32	6	29	52	127	127	33.42	
		USD101.00 – USD150.00	-	-	-	-	5	-	8	44	57	57	15.00	
		>USD150.00	-	-	-	-	-	1	3	19	23	23	6.05	

Table 2. Number of respondents who were hand tractor owners in East Kalimantan the year 2014.

City/Regency	Region (Subcity/Subregency)	Respondent (paddy household)	Percentage (%)	Hand tractor owner (respondent)	Percentage (%)
Bontang	North Bontang	1	0.26	0	0.00
	South Bontang	2	0.53	0	0.00
Kutai Kartanegara	Muara Muntai	4	1.05	0	0.00
	Loa Janan	17	4.47	2	0.53
	Tenggarong Seberang	128	33.68	17	4.47
Penajam Paser Utara	Waru	16	4.21	4	1.05
	Penajam	84	22.11	17	4.47
	Babulu	128	33.68	8	2.11
Total		380	100	48	12.63

Table 3. Number of respondents who were hand tractor renters in East Kalimantan the year 2014.

City/Regency	Region (Subcity/Subregency)	Respondent (paddy household)	Percentage (%)	Hand tractor renter (respondent)	Percentage (%)
Bontang	North Bontang	1	0.26	1	0.26
	South Bontang	2	0.53	2	0.53
Kutai Kartanegara	Muara Muntai	4	1.05	4	1.05
	Loa Janan	17	4.47	15	3.95
	Tenggarong Seberang	128	33.68	111	29.21
Penajam Paser Utara	Waru	16	4.21	12	3.16
	Penajam	84	22.11	67	17.63
	Babulu	128	33.68	120	31.58
Total		380	100	332	87.37

Table 4. Number of respondents and mean farm sizes and tillage costs in East Kalimantan the year 2014.

City/Regency	Region (Subcity/Subregency)	Respondent (paddy household)	Mean of farm size (ha)	Mean of tillage cost (USD)	Mean of tillage cost (USD ha ⁻¹)
Bontang	North Bontang	1	0.63	43.36	69.37
	South Bontang	2	0.63	43.36	69.37
Kutai Kartanegara	Muara Muntai	4	0.75	36.42	48.56
	Loa Janan	17	0.71	36.73	52.03
	Tenggarong Seberang	128	1.08	52.54	48.56
Penajam Paser Utara	Waru	16	1.19	82.38	69.37
	Penajam	84	1.02	70.82	69.37
	Babulu	128	1.76	122.19	69.37
Total		380			

tractors because have higher tillage costs rather than Kutai Kartanegara.

Data availability

Underlying data

The answers to the questionnaire, along with basic demographic information generated in this study are available on OSF. DOI: <https://doi.org/10.17605/OSF.IO/C7EX9> (Karmini, 2018).

Extended data

The questionnaire used in this study is available on OSF. DOI: <https://doi.org/10.17605/OSF.IO/C7EX9> (Karmini, 2018).

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

References

Hamsa KR, Srikantha MPS, Gaddi GM: **Comparison of cost and returns of major food crops under Central Dry Zone of Karnataka**. *IOSR J Agric Vet Sci*. 2017; **10**(6): 21–26.

[Publisher Full Text](#)

Hristova M, Maddock N: **Private agriculture in Eastern Europe**. *Food Policy*. 1993; **8**(6): 459–462.

[Publisher Full Text](#)

Karmini: **Comparison of Tillage Costs among Eight Paddy Farm Regions in East Kalimantan, Indonesia**. *OSF. Web*, 2018.

Karmini: **Factors affecting paddy farm income in East Kalimantan, Indonesia**. *Biodiversitas*. 2017; **18**(1): 101–108.

[Reference Source](#)

Larson DF, Plessmann F: **Do farmers choose to be inefficient? Evidence from Bicol**. *J Dev Econ*. 2009; **90**(1): 24–32.

[Publisher Full Text](#)

Narayanamoorthy A, Bhattarai M, Suresh R, *et al.*: **Farm mechanisation, MGNREGS and labour supply nexus: A state-wise panel data analysis on paddy and wheat crop**. *Ind Jn Of Agri Econ*. 2014; **69**(3): 320–335.

[Reference Source](#)

Ogunbanwo AS, Okesola JO, Buckley S: **Knowledge management awareness assessment in Nigerian tertiary institutions [version 2; peer review: 2 approved]**. *F1000Res*. 2019; **8**: 608.

[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)

Pobhirun T, Pinitsoontorn S: **The association between health literacy and pesticide use behaviors among sweet corn farmers in the Pak Chong district of Thailand: a cross-sectional study [version 2; peer review: 2 approved]**. *F1000Res*. 2019; **8**: 448.

[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)

Rea LM, Parker RA: **Designing and Conducting Survey Research. A Comprehensive Guide**. Jossey-Bass Publishers, San Fransisco, 1997.

[Reference Source](#)

Statistics East Kalimantan: **Farm Data Collection 2009**. BPS Statistics East Kalimantan, Samarinda, 2009.

Statistics Indonesia: **Trends of Selected Socio-Economic Indicators of Indonesia**. BPS Statistics Indonesia, Jakarta, 2008.

[Reference Source](#)

Open Peer Review

Current Peer Review Status:

Version 2

Reviewer Report 02 July 2021

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Ganganee Chandima Samaraweera

Department of Agricultural Economics , Faculty of Agriculture, University of Ruhuna,
Kamburupitiya, Matara, Sri Lanka

I read the revised version. Now it's OK from my side.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Agricultural Economics, Agricultural Marketing, Consumer behavior

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 11 March 2021

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Ganganee Chandima Samaraweera

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Kamburupitiya, Matara, Sri Lanka

Even the author mentioned significant differences, p values are not given (specially in case of ownership and other variables, it says, (There are significant differences the number of hand

tractor owners, the number of hand tractor renters, and the tillage costs among the eight paddy farm regions in East Kalimantan, Indonesia.). However, it didn't show clearly. The demographic status of the respondents is not mentioned, and the statistical analyses are not adequate as the author used only Chi-Square test. It is a serious issue as this is the only stat method used here. Better to expand the analytical tools as this cannot be generalized to the vast majority.

More recent literature is needed to be addressed and authors should mention the compatibility of their research findings with other relevant literature documented so far.

In the Methodology, it should be clearly mention the reason of selecting study areas, and the clear way of selecting the sample from the population

Hence, I will give my recommendation after adding those comments.

Is the work clearly and accurately presented and does it cite the current literature?

No

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Agricultural Economics, Agricultural Marketing, Consumer behavior

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 10 Apr 2021

Karmini Karmini, University of Mulawarman, City of Samarinda, Indonesia

The authors revision for review on 11 March 2021 by Ganganee Chandima Samaraweera, Department of Agricultural Economics, Faculty of Agriculture,

University of Ruhuna, Kamburupitiya, Matara, Sri Lanka.

Reviewer: Even the author mentioned significant differences, p values are not given (specially in case of ownership and other variables, it says, (There are significant differences the number of hand tractor owners, the number of hand tractor renters, and the tillage costs among the eight paddy farm regions in East Kalimantan, Indonesia.). However, it didn't show clearly.

Authors: We added *p*-values in sections of Hand tractor ownership, Hand tractor renter, and Tillage cost.

Reviewer: The demographic status of the respondents is not mentioned,

Authors: We added Table 1 and information of respondents' socioeconomic-demographic characteristics in section of Characteristics of respondents.

Reviewer: and the statistical analyses are not adequate as the author used only Chi-Square test. It is a serious issue as this is the only stat method used here. Better to expand the analytical tools as this cannot be generalized to the vast majority.

Authors: We added descriptive statistics to count the frequency, total, percentage, maximum, and minimum in section Statistical analysis. We revised Chi Square One Sample with One Way Anova to test hypothesis that there are no significant differences the tillage costs among Bontang, Kutai Kartanegara, and Penajam Paser Utara in sections of Statistical analysis and Tillage cost.

Reviewer: More recent literature is needed to be addressed

Authors: We added references of Pobhirun and Pinitsoontorn (2019), Statistics Indonesia (2008), Statistics East Kalimantan (2009), and Ogunbanwo et al. (2019) in section of References.

Reviewer: and authors should mention the compatibility of their research findings with other relevant literature documented so far.

Authors: Statistics Indonesia (2008) and Statistics East Kalimantan (2009) reported data of paddy farm income and paddy productivity in section Study area. Ogunbanwo et al. (2019) and Pobhirun and Pinitsoontorn (2019) used descriptive statistics and Chi Square test in their researches in section Statistical analysis.

Reviewer: In the Methodology, it should be clearly mention the reason of selecting study areas,

Authors: We added the reasons of selecting study areas associate with comparison of paddy farmer income and paddy productivity in provinces in Kalimantan in section Study area.

Reviewer: and the clear way of selecting the sample from the population. Hence, I will give my recommendation after adding those comments.

Authors: We added the random number method assigned every sample a number, then randomly picked samples by using a table of random numbers in section of Subject recruitment.

Is the work clearly and accurately presented and does it cite the current literature?

Reviewer: No

Authors: Additional references in sections of Methods (Study area, Statistical analysis) and References.

Is the study design appropriate and is the work technically sound?

Reviewer: Partly

Authors: Additional information in section of Methods (Study area and Subject recruitment).

Are sufficient details of methods and analysis provided to allow replication by others?

Reviewer: Partly

Authors: Additional and revision of methods in sections of Methods (Statistical analysis) and Results and discussion (Tillage cost)

If applicable, is the statistical analysis and its interpretation appropriate?

Reviewer: Partly

Authors: Additional the results of data analysis and information in section of Results and discussion (Characteristics of respondents, Hand tractor ownership, Hand tractor renter, and Tillage cost).

Are all the source data underlying the results available to ensure full reproducibility?

Reviewer: Partly

Authors: The questionnaire and data already available in section of Data Availability (Underlying data and Extended data).

Are the conclusions drawn adequately supported by the results?

Reviewer: Partly

Authors: Additional and revision of analysis results in sections of Conclusions and Abstract.

Competing Interests: No competing interests were disclosed.

Reviewer Report 14 January 2019

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Ahmad Shuib

University Putra Malaysia (UPM), Seri Kembangan, Malaysia

1. *Is the work clearly and accurately presented and does it cite the current literature?*

Very limited references and a few dated references.

2. Is the study design appropriate and is the work technically sound?

This is a straight forward descriptive study using Chi-squared tests to determine significant differences. It would have been more informative if the author had included the derivation of the costs of the equipment and the tillage operation from the user's actual expenditure.

3. Are sufficient details of methods and analysis provided to allow replication by others?

The process of collecting data was sufficiently discussed although the determination of the sample size was not clearly explained. If the data collection was carried out by the researcher herself without any assistant, it must have taken a long time to get data from 380 respondents. Samples of 1 and 2 for Bontang North and Bontang South respectively was not justified.

4. If applicable, is the statistical analysis and its interpretation appropriate?

For a descriptive study to determine differences in usage of the machinery, the analysis is adequate. But for practical and policy decision purposes, the analysis may not provide sufficient evidence to help the relevant agencies to take the appropriate actions.

5. Are all the source data underlying the results available to ensure full reproducibility?

The author has clearly discussed the sources of data used in the study.

6. Are the conclusions drawn adequately supported by the results?

This is a simple descriptive study with straight forward conclusions. The analysis will be useful for further causal relationship analysis.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Natural Resource Economics, Tourism Planning and Development

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 10 Apr 2021

Karmini Karmini, University of Mulawarman, City of Samarinda, Indonesia

The authors revision for review on 14 January 2019 by Ahmad Shuib, University Putra Malaysia (UPM), Seri Kembangan, Malaysia.

1. Is the work clearly and accurately presented and does it cite the current literature?

Reviewer: Very limited references and a few dated references.

Authors: We added references of Pobhirun and Pinitsoontorn (2019), Statistics Indonesia (2008), Statistics East Kalimantan (2009), and Ogunbanwo et al. (2019) in section of References.

2. Is the study design appropriate and is the work technically sound?

Reviewer: This is a straight forward descriptive study using Chi-squared tests to determine significant differences.

Authors: We added methods of Descriptive statistics (to count the frequency, total, percentage, maximum, and minimum) and One Way Anova besides Chi Square One Sample (to test hypotheses) in section of Statistical analysis.

Reviewer: It would have been more informative if the author had included the derivation of the costs of the equipment and the tillage operation from the user's actual expenditure.

Authors: We added information if the amount of hand tractor rental cost at the research location includes machine rental cost, machine maintenance cost, and operator wage in section of Tillage cost.

3. Are sufficient details of methods and analysis provided to allow replication by others?

Reviewer: The process of collecting data was sufficiently discussed although the determination of the sample size was not clearly explained.

Authors: We added method to determine the sample size in section of Subject recruitment.

Reviewer: If the data collection was carried out by the researcher herself without any assistant, it must have taken a long time to get data from 380 respondents.

Authors: We added second author and enumerators whereas the researchers employed the enumerators to help the interviews process in sections of Author and Subject recruitment.

Reviewer: Samples of 1 and 2 for Bontang North and Bontang South respectively was not justified.

Authors: The determination of number of samples for North Bontang (24 paddy

households; 1 sample) and South Bontang (120 paddy households; 2 samples) was already appropriate based on proportional sampling method and already fulfilled the minimum sample size for population (380 samples) in section of Subject recruitment.

4. If applicable, is the statistical analysis and its interpretation appropriate?

Reviewer: For a descriptive study to determine differences in usage of the machinery, the analysis is adequate. But for practical and policy decision purposes, the analysis may not provide sufficient evidence to help the relevant agencies to take the appropriate actions.

Authors: We added recommendations if farm machinery are required to develop paddy farming also Bontang and Penajam Paser Utara are the recommended regions for the activities in relation to increase the ownership of hand tractors because have higher tillage costs rather than Kutai Kartanegara in section of Conclusions.

5. Are all the source data underlying the results available to ensure full reproducibility?

Reviewer: The author has clearly discussed the sources of data used in the study.

Authors: The questionnaire and data are already available in sections of Extended data and Underlying data

6. Are the conclusions drawn adequately supported by the results?

Reviewer: This is a simple descriptive study with straight forward conclusions.

Authors: We revised the results of hypotheses testing in sections of Conclusions and Abstract.

Reviewer: The analysis will be useful for further causal relationship analysis.

Authors: We added some factors caused differences the number of hand tractor owners, the number of hand tractor renters, and the tillage costs among some regions in East Kalimantan, Indonesia in section of Conclusions.

Is the work clearly and accurately presented and does it cite the current literature?

Reviewer: Partly

Authors: Additional references in section of References.

Is the study design appropriate and is the work technically sound?

Reviewer: Yes

Authors: Additional information in sections of Methods (Statistical analysis) and Results and discussion (Tillage cost).

Are sufficient details of methods and analysis provided to allow replication by others?

Reviewer: Partly

Authors: Additional of method, second author, and enumerators in sections of Author and Methods (Subject recruitment).

If applicable, is the statistical analysis and its interpretation appropriate?

Reviewer: Yes

Authors: Additional recommendations in section of Conclusions.

Are all the source data underlying the results available to ensure full reproducibility?

Reviewer: Partly

Authors: The questionnaire and data already available in section of Data Availability (Underlying data and Extended data).

Are the conclusions drawn adequately supported by the results?

Reviewer: Yes

Authors: Additional and revision of the analysis results in sections of Conclusions and Abstract.

Competing Interests: No competing interests were disclosed.

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