

The Influence of Farmer's Characteristic on η at 'Simantri' Program in Bali

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Abstract. The aims of this study were to analyze the influence of farmers' characteristics on cattle waste processing, and also what is the strongest indicator to reflect the variables of farmer's characteristic and cattle waste processing. Structured questionnaires were used to obtain information from 112 respondents consisting of two persons as group's representatives of Simantri members from 2014-2015. The groups of Simantri selected by purposive sampling method. Data obtained were analyzed by a descriptive method and statistic analysis. Results indicated that the farmer's characteristics proved to have a positive and significant effect on cattle waste processing. The skill of Simantri is the strongest indicator to reflect the variable of farmers characteristic because it has the highest value of weight measurement (0.898). Biogas is the strongest indicator to reflecting the cattle waste processing with the weight measurement value of 0.987. The skills of respondents to the processing of cattle waste into solid and liquid fertilizer is closely related to the frequent training, the addition of knowledge and experience in the cattle waste processing.

1. Introduction

In the application of an innovation, the farmer's characteristics have been shown to significantly affect the application of innovation. Damihartini [1] mentions that an important component affecting the competence of agribusiness farmers is the personal characteristics of farmers that include, formal education, training, and experience. This program is a government program that started in 2009. Simantri is a breakthrough step to accelerating the adoption of agricultural technology because it is a pilot model development in order to accelerate technology transfer to rural communities. Simantri integrates agricultural sector activities with supporting sectors both vertically and horizontally according to the potential of each region by optimizing the utilization of local resources [2]. Furthermore, the integration activities carried out are oriented also on zero waste farming and produce 4 F (food, feed, fertilizer, and fuel). Cattle waste processing is an important part of Simantri and therefore interesting to analyze the influence of farmers characteristics on cattle waste processing.

McCulloch & Ota, 2002 [3] states that, observed from the demographic characteristics that affect the performance of farmers include age, household size, formal education, size of farm, experience in farming, farm income, nonfarm income, adoption of modern farming methods, land ownership and ownership of farm equipment. Another research showed that yam production in Nigeria was positively influenced by age, educational level, farming experience, farm distance from the residence and income level of the farmers [4]. Different results were found by Nwosu, et al [5] which said that apart from



insurance, other socio-economic characteristics that influenced performance included educational level, farming experience, farm size and number of technologies used in the farm while age, sex, and household size had an insignificant contribution. Among the socio-economic characteristics of the farmers that were influencing their adoption decision of organic farming technologies were a level of formal education, gender, and off-farm income. Age of the farmer, farm size and contact with technology promoters did not affect their adoption decision [6]. The results of Makalew et al [7] research showed that: 1) the farming characteristic such as age, education level, and number of family member, and farming characteristic such as area number, farming experience, the distance to manure source, and contact with the instructor which influenced to farmer motivation in using organic manure; 2) farming characteristic such as area number, the distance with manure source and farmer motivation influenced the level of innovation adoption; 3) variable of farmer motivation was functioned as the mediation intervening variable between farmer characteristic (age, education level, and number of family member) and farming characteristic (area number, farming experience, the distance with manure source, and contact with the instructor) to the influence on farmer adoption in using organic manure. Based on some previous research that has been presented, the problem of this research was how is the influence of farmers characteristics on cattle waste processing and also what is the strongest indicator to reflect the variables of farmers characteristic and cattle waste processing. The aims of this study were to analyze the influence of farmer's characteristics on cattle waste processing, and also what is the strongest indicator to reflect the variables of farmer's characteristic and cattle waste processing.

2. Material and methods

The research was conducted in eight regencies of Bali. There are 130 groups of Simantri which 24 groups are in Buleleng regency, 17 groups in Jembrana, 23 groups in Tabanan, 13 groups in Badung and Karangasem, 16 groups in Gianyar, 10 groups in Klungkung, and 14 groups in Bangli. The groups of *Simantri* were determined by purposive sampling method.

Determination of the respondents that will be used as samples in this study is using the Slovin formula [8]. With the Slovin formula obtained sample as much as 56 groups, with the result that total respondents were 112, consisted of two persons as groups representatives of Simantri members from 2014-2015. Source of data consisted of primary and secondary data. The qualitative and quantitative data were collected directly and followed by an in-depth interview, observation, and documentation. Data were analyzed statistically and by a descriptive method. Descriptive method was used for interpretation the farmers' characteristics consists of 7 indicators (age, formal education, attitude about Simantri, Simantri knowledge, Interaction with Simantri Counselor, skill about Simantri, and experience), meanwhile, cattle waste processing consists of 3 indicators (Biogas, Compost, Biourine). Statistical analysis was used to analyze the influence of farmers' characteristics on cattle waste processing by PLS (partial least square) with Smart PLS software version 2.0.

3. Results

Based on data processing using PLS, the result of data processing then evaluated the model of the structural equation. In this phase, there are two basic evaluations: 1) evaluation of the outer model to determine the validity and reliability of the indicators measuring the latent variables, and 2) the evaluation of the inner model to determine the accuracy of the model. On convergence validity test, the indicator is considered valid if it has a value of weight measurement above 0.40 and or t-statistic value above 1.96. Indicators that do not fulfill the requirements will be excluded from the model before performing further data processing. The value of the measurement weights can be used to know the contribution of each indicator/item to the latent / construct variable. Weights measurement of an indicator with the highest value indicates that it is the strongest indicator or the most important indicator in its latent variables. For more details, the measurement model test can be seen in Table 1.

Table 1. Evaluation of measurement models (*outer model*).

Variable	Indicator/Item	Weight Measurement	t-statistics
Farmers Charac- teristics (X)	Age	0.036	0.308
	Formal Education	0.788	13.871
	Attitude About Simantri	0.856	27.476
	Simantri Knowledge	0.565	5.689
	Interaction with Simantri Counselor	0.255	2.498
	Skill About Simantri Experience	0.898	32.992
		0.761	12.185
		0.987	278.885
Cattle Waste Processing (Y)	Biogas	0.987	152.165
	Compost	0.983	166.885
	Biourine	0.979	

The result of measurement model examination presented in Table 1 shows that only the age and interaction with Simantri counselor which weight measurement value less than 0.40. Its means, the age and interaction with Simantri counselor is not a valid or unsuitable indicator to be used to reflect the farmers' characteristics because both have small value of weight measurement, while formal education, the attitude about Simantri, the knowledge of Simantri, the skill of Simantri and experience is an indicator valid as a measure of farmers' characteristics variables. The result showed that the skill of Simantri is the strongest indicator to reflect the variable of farmers characteristic because it has the highest value of weight measurement (0.898). This result is identical with Susanti [9] who reported that the relationship between age of farmers, farming area, farmers' income level, and nature of innovation with farmer's decision was not significant.

This result indicates that the skill about Simantri is the main reflection about the farmer's characteristics. The skills of respondents to the processing of cattle waste into solid and liquid fertilizer is closely related to the frequent training, the addition of knowledge and experience in the cattle waste processing. Skill is the result of the process of one's work experience on the methods of a job due to his involvement in the implementation of the work task [10]. The longer the respondent experience in the cattle waste processing mentioned above, accordingly more trial and error will occur, which will increase the knowledge and skills. This is accordance with Todaro [11] who said that the quality of a person's human resource is influenced by the skill level and education level.

The evaluation results of cattle waste processing variable indicated that the three indicators have a value of weight measurement greater than 0.40 with t-statistics far above 1.96. These results indicate that the biogas, compost, and Biourine are valid indicators to reflect variables of cattle waste processing. Moreover, the results of the evaluation indicate that biogas is the strongest indicator in reflecting the application of cattle waste processing with the weights measurement value of 0.987. As it is known that biogas provides great benefits to farmers who as Simantri members. Biogas energy benefits are used as alternative fuels or especially substitutes kerosene used by the community for cooking [12]. Moreover, Biogas residue (slurry) which is a byproduct of biogas contains fewer pathogenic bacteria so it is safe to use fertilize fruit or vegetable crops, especially plants for fresh consumption [13]. According to result of testing the effect of farmers' characteristic variables on the cattle waste processing variable which have been elaborated above, path diagram (Figure 1) below shows direct effect of relation between variables.

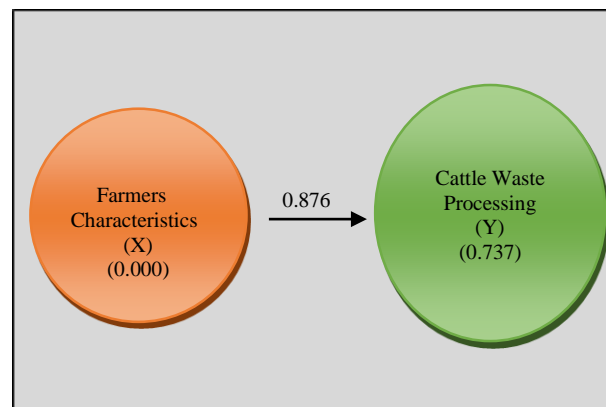


Figure 1. Direct effect testing of farmer's characteristic influence on cattle waste processing.

The direct effect test on farmer's characteristic variables and cattle waste processing is done by t-test on each partial direct effect path. The results of the validation of path coefficient on each path for direct effect can be seen in Table 2.

Table 2. The result of direct effect testing of farmer's characteristic influence on cattle waste processing.

No	Relation Between Variables	Path Coefficient (Bootstrapping)	t-statistics	Explanation
1	Farmers Characteristics (X) → Cattle Waste Processing (Y)	0.876	15.479	Significant

In adopting an innovation, especially the cattle waste processing in the Simantri program showed that the farmer's characteristics have a positive and significant effect on cattle waste processing. This result showed a positive value of 0.876 path coefficient with t-statistic equal to 15.479 (> 1.96). This result suggests that the better characteristics of farmers as Simantri member, accordingly the cattle waste processing will be increased. Mardikanto [14] explains that the adoption in agricultural extension can be defined as the process of behavior change either in the form of knowledge, attitudes, and skills in a person after receiving "innovation" which was delivered from extension agent to the targeted.

4. Conclusion

The farmer's characteristics proved to have a positive and significant effect on cattle waste processing. The skill of Simantri is the strongest indicator to reflect the variable of farmers characteristic because it has the highest value of weight measurement (0.898). Biogas is the strongest indicator to reflecting the cattle waste processing with the weight measurement value of 0.987.

References

- [1] Damihartini, Rini S and Amri J 2005 "Relation of Farmer Characteristics with Agribusiness Competence in Vegetable Farming in Kediri Regency East Java," *Journal of Counseling: Bogor Agricultural Institute* **1** (1).
- [2] Food Crop Agriculture Department 2010 *Sustainable Village Development With Simantri (Integrated Farming Management System)* Department of Agriculture Food Crop of Bali Province, Bali.
- [3] McCulloch N and Ota M 2002 *Export horticulture and poverty in Kenya* (Institute of Development Studies, Working Paper No. 174).
- [4] Oluwatusin F and Shittu G 2014 "Effect of socio-economic characteristics on the farm productivity performance of yam farmers in Nigeria," *Research on Humanities and Social*

- Sciences* **4** (6) 2224-5761.
- [5] Nwosu F O, Oguoma N N O, Lemchi J I, Ben –Chendo G N, Henri-Ukoha A and Onyeagocha I I 2010 “Output Performance of Food-Crop Farmers under the Nigerian Agricultural Insurance Scheme in Imo State, South East, Nigeria,” *Academia Arena* **2** (6) 43.
 - [6] Muchangi C T 2016 *Influence Of Farmer’s Characteristics, Agricultural Extension And Technology Specific Factors On Adoption Of Organic Farming Technologies In Embu West Sub County, Embu, Kenya*. Retrieved from <http://erepository.uonbi.ac.ke/bitstream/handle/11295/97114/Chomba%20Titus%20Muchangi.pdf?sequence=1&isAllowed=y>
 - [7] Makalew, Jocelien, Zaenal Kusuma, Sugiyanto and Zetly Tamo 2013 “The Influence of Farmer Characteristic and Farming to the Farmer Motivation on Using Organic Manure (Case Study in East Tombatu District, South-East Minahasa Regency),” *International Journal of Engineering Inventions* **3** (1) 43-51.
 - [8] Umar H 2004 *Research Methods For Thesis And Business Thesis*, 6th publish (Jakarta: PT. RajaGrafindo Persada).
 - [9] Susanti L W, Sugihardjo, Suwanto 2007 “Factors Affecting Farmer's Decision Making in the Application of Organic Rice Farming in Sukorejo Village, Sambirejo Sub-District, Sragen Regency,” *Agritexts* (24). Faculty of Agriculture UNS, Surakarta.
 - [10] Manulang 1984 *Personnel Management* (Ghalia Indonesia , Jakarta).
 - [11] Todaro M P 2004 *Third World Economic Development* Volume 1. 8th Edition (Erlangga, Jakarta).
 - [12] Agricultural Departement 2009 *Utilization of Waste and Livestock Waste into Biogas Energy* (Bioenergy Rural Series. Directorate General of Agricultural Products, Directorate General of Processing and Marketing of Agricultural Products, Jakarta).
 - [13] Widodo T W, A Nurhasanah, A Asari and A Unadi 2006 *Utilization of Biogas Energy to Support Agribusiness in Rural Area* (Indonesian Center for Agriculture Socio-Economic and Policy Studies. Bogor).
 - [14] Mardikanto T 1993 *Extension Agricultural Development* (Sebelas Maret University Press, Surakarta).