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## FACTORS INFLUENCING THE CONVERSION TO ORGANIC RICE FARMING

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### ABSTRACT

The making of implementation policies to promote organic rice farming must be based on a good understanding of the factors influencing farmers' decision to convert to organic rice farming. This research aimed to answer and understand more deeply the factors influencing farmers' decision to switch from conventional to organic rice farming. This research was a case study on Jembar II Farmers Group in Margahayu Village, Indonesia. The results showed that all the variables, namely farmer characteristics, institutions, and farmer behaviors simultaneously affected the farmers' conversion decision from conventional to organic rice farming. Meanwhile, partially, only two variables affected the farmers' decision to convert to organic rice farming, namely farmer behaviors related to product prices and productivity as well as marketing institutions.

### KEY WORDS

Organic rice farming, conventional farming, farmer characteristics, institutions, behaviors.

Organic farming is growing rapidly in all parts of the world. Since 2000, the organic land area has increased by almost 15 million hectares to 50.9 million hectares with total producers of 2.4 million, of which more than three-quarters of the producers were in developing countries (Willer and Lernoud, 2017). The growth of the organic farming in developing countries is triggered by the consumer preference to choose safer and healthier food ingredients and the development of people trends or lifestyle, ultimately leading to the high demand for organic products, particularly in developed countries (Karki *et al.*, 2011; Widiarta *et al.*, 2011). The high demand of developed countries' consumers and high prices cause organic products yielded in developing countries to be largely exported. This certainly provides opportunities for exporters in developing countries to buy organic products from farmers at premium prices. However, the farmers still often face obstacles, one of which is low agriculture productivity. Hence, organic farming in developing countries is becoming a tool of socio-economic development and is supported by various international and national development initiatives (Reddy, 2010; Twarog, 2010; Kilcher & Echeverria, 2010). In 2007, the global trade of organic products reached USD \$46.1 billion or 36.2 billion Euro (IFOAM, 2009). Even, it reached more than 60 billion Euro in 2014 (FiBL Survey, 2016).

The growth rates of organic production depend on different factors and vary from country to country and region to region (Broadt & Schug, 2008). In 2011, the organic land area throughout Asia covered 3.69 million hectares. In 2015, it increased by 7.5% to 3.97 million hectares. Meanwhile, in Indonesia, the organic land area reached 74,034.09 hectares in 2011 and increased by 76% to 130,384.38 hectares in 2015, so the share percentage of the total world organic farming area increased from 0.14% in 2011 to 0.23% in 2015 (Willer and Lernoud, 2017).

Organic products in developing countries tend to be more in demand due to its various benefits and advantages compared to conventional farming. Organic farming can protect and maintain soil health, significantly improve soil quality in terms of physical, fertility, and biological properties, enable ecosystems to better adapt to the impacts of climate changes, and increase the potential for carbon sequestration from the soil (Surekha *et al.*, 2013; Pathak *et al.*, 1992; Carpenter Boggs *et al.*, 2000; Bhooshan *et al.*, 2011). In terms of economic welfare, organic farming contributes to increasing farmers' income through higher productivity than conventional rice farming, and premium prices (Surekha *et al.*, 2013; Reddy, 2010). Meanwhile, the social contribution of organic farming is to avoid/ anticipate

natural damages such as infertile soil, water pollution, biodiversity erosion, greenhouse gas emission, food scarcity, and pandemics related to chemical agriculture and pesticide poisoning, eventually leading to healthy communities (Scialabba, 2013). In principle, the ecological or organic farming system recalls the importance of ecological foundations of the existing farming systems. Organic agriculture has been proposed as an important means to achieve these goals (Seufert, 2012).

The number of organic rice farmers in East Priangan, West Java Province as the research location often experiences fluctuation. In 2011, there were 2,600 farmers. Based on this situation, the researchers were interested to examine the main reason underlying the farmers to switch from conventional to organic rice farming. The understanding of the factors influencing farmers' conversion decision from conventional to organic rice farming is a prerequisite for formulating policies that will encourage the productivity of organic rice in the research location. There have been many studies examining the factors influencing farmers' conversion to organic agriculture, both in developed and developing countries. Several studies have suggested that the main factors influencing farmers' decision to convert to organic agriculture include environmental awareness, health, promising market prospects, economic benefits (Karki *et al.*, 2011), profits, higher selling prices and incomes resulting from organic farming practices (Dabbert *et al.*, 2004; De Cock, 2005, Sukristoyonubowo *et al.*, 2011). Meanwhile, the non-economic (social) influencing factors are healthier rice quality due to minimal pest and disease (Sukristoyonubowo *et al.*, 2011).

The previous studies have shown various factors determining farmers' conversion decision from conventional to organic agriculture. These factors were used as the basis in the hypothesis formulation in this research. Until now, there has been no any study explaining the reasons underlying the farmers in the development area of East Priangan to switch from conventional to organic rice farming. The main purpose of this research was to answer and understand more deeply the factors influencing farmers' conversion decision from conventional to organic rice farming in East Priangan region.

## METHODS OF RESEARCH

This research was a case study on Jembar II Farmers Group in Margahayu Village, Manonjaya Subdistrict, Tasikmalaya Regency. The research location was selected purposively by considering that Manonjaya Subdistrict is one of the centres of rice production in Tasikmalaya Regency, which is also the development area of organic rice. The analysis unit of this research was individual. The data collection were carried out through a census of 46 members of Jembar II Farmers Group in Margahayu Village, Manonjaya Subdistrict, Tasikmalaya Regency. The respondents of this research were organic farmers who had implemented organic *SRI* rice farming practices.

In addition to distributing questionnaires, face-to-face interviews were also carried out with the organic rice farmers to obtain all the information needed in this research. The number of respondents interviewed was 46 people. The questionnaires were designed to obtain data related to the socio-economic characteristics of organic farmers, including age, sex, farming area, education, and farming experience.

To understand the decision-making process, the respondents were asked about the reasons underlying their decision of conversion from conventional to organic rice farming. The respondent behaviors and their main reasons to switch to organic rice farming were analyzed using a set of statement items with a Likert-scale ranging from (1) *Very Disagree* to (5) *Very Agree*. Pre-test questionnaires were also distributed to 20 respondents. From the pre-test questionnaires, several farming indicators that had confusing or difficult statements to be answered by the respondents were then omitted or refined. Only understandable statements were taken to be further analyzed.

In addition to primary data collection from the organic rice farmers, in-depth interviews were done with various stakeholders engaged in the organic rice development. The interviews aimed to obtain additional information in relation to social, economic, and political issues emerging along with the organic rice development in the research area. The results of

the interview stakeholders were analyzed with a narrative analysis method and then presented as additional information to the respondent analysis results.

The data analysis in this research was carried out with different treatments according to the data types obtained and the hypotheses formulated. According to Miles and Huberman (1984) in Sugiyono (2009), qualitative data are processed through three stages of analysis, namely data reduction, data display, and conclusion drawing. Data reduction is done by summarizing, selecting key elements, and focusing on important things according to research needs. Data display is presenting data in the form of brief descriptions and direct quotes to support quantitative data. Meanwhile, conclusion drawing is made after obtaining findings on the object of research.

The primary data of this research were obtained with a quantitative method, from the questionnaire filling results. The data were then edited and processed using *SPSS 19.0 for Windows*. Furthermore, the processed data were examined using Parametric Statistics for the hypothesis testing of each factor (partially). Hypothesis testing was also done using Multiple Linear Regression to determine the simultaneous effect of the factors on the farmers' conversion decision from conventional to organic rice farming.

The equation of the multiple linear regression analysis is shown as follows:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3$$

Where: Y = Dependent Variable (Conversion Decision to Organic Rice Farming);  $b_0$  = Interception;  $b_1, b_2, b_3, b_4$  are regression coefficients;  $X_1$  is Farmer Characteristics,  $X_2$  is Institutions dan  $X_3$  is Farmer Behaviors.

The factors influencing the decision of conversion to organic rice farming simultaneously were known by testing the F value using the following formula:

$$F_{\text{count}} = \frac{\text{Jk regression} / k}{\text{Jk residue} / (n-k-1)}$$

Where: Jk regression =  $b_1 \sum X_{1i} y_i + b_2 \sum X_{2i} y_i + b_3 \sum X_{3i} y_i + b_4 \sum X_{4i} y_i + b_5 \sum X_{5i} y_i$ ; Jk residue =  $\sum (Y_i - \hat{Y}_i)^2$ ; if  $F_{\text{count}} < F_{\text{table}} (\alpha = 0.05)$ ,  $H_0$  will be accepted, meaning that all independent variables (X) simultaneously have no effect on the dependent variable (Y) and if  $F_{\text{count}} \geq F_{\text{table}}$ ,  $H_0$  will be rejected, meaning that all independent variables (X) simultaneously have an effect on the dependent variable (Y).

The effect of each factor on the decision of conversion to organic rice farming was determined by testing the t-value using the following formula:

$$t_{\text{hit}} = \frac{b_i}{Sb_i}$$

Where:  $Sb_i = \sqrt{\text{variance } b_i}$ , while Variance  $b_i = \sigma^2 (x'x)^{-1}$ ; if  $t_{\text{count}} < t_{\text{table}}$ ,  $H_0$  will be accepted, meaning that Variable  $X_i$  has no effect on Variable Y, If  $t_{\text{count}} \geq t_{\text{table}}$ ,  $H_0$  will be rejected, meaning that Variable  $X_i$  has an effect on Variable Y.

Furthermore, the accuracy degree of the relationship between the independent variables and the dependent variable was measured using the following formula (Sudjana, 1996):

$$R^2 = \frac{\text{Jk regression}}{\sum Y_i^2}$$

## RESULTS AND DISCUSSION

Based on the analysis results, all the variables (*farmer characteristics, institutions, farmer behaviors*) simultaneously had a considerable effect on the farmers' decision of

conversion from conventional to organic rice farming with a significance value  $>_{\alpha} = 0,01$ . Meanwhile, partially, only two variables greatly affected the farmers' conversion decision to organic rice farming with a significance value  $<_{\alpha} = 0,01$ , namely farmer behaviors related to rice prices and productivity as well as marketing institutions.

The respondent (farmer) characteristics together with the institutions and behaviors affected the conversion decision from conventional to organic rice farming. This is in line with several previous studies conducted by Kallas *et al.* (2009), Rigby *et al.* (2001), and Scialab badan hattam (2002) finding that some of the most relevant factors influencing farmers' decision to switch to organic agriculture are farmer characteristics, farmer behaviors, farmer opinions, non-economic factors, characteristic differences in terms of demographics, economic situation and the farmer attitudes compared to conventional farmers, technical factors and institutional support.

Information on the higher premium prices and productivity of organic rice compared to conventional rice would greatly influence farmers' decision to switch to organic rice farming. It cannot be denied that each farmer always wants to get high profits from their farming. The high profits can be achieved through increased productivity coupled with high product prices. This is consistent with the results of Heryadi and Rofatin's (2016) study stating that the main preference of farmers in the selection of organic *SRI* rice farming system is to obtain the optimum profits. The price of organic rice in the research location was IDR 650,000.-/ quintal (processed paddy) higher than the conventional rice price of IDR 500,000.-/ quintal (processed paddy). The average productivity of organic rice was 7.45 tons/hectare, larger than the average conventional rice productivity at Manojaya District level which amounted to 6.771 tons/hectare (processed paddy) (Planning and Development Agency of Manonjaya, Tasikmalaya Regency, 2013).

Furthermore, the existence of organic rice marketing institutions that can accommodate all the organic rice yields of farmers and the premium price guarantee led the farmers to convert to organic rice farming. Organic rice in the research location was easily marketed through its farmers' group. By the farmers' group, organic rice would be then sold to *Gapoktan SIMPATIK* with guaranteed markets and reasonable prices as expected by farmers.

## CONCLUSION AND SUGGESTIONS

Simultaneously, all the variables, including farmer characteristics, institutions, and farmer behaviors, have a great effect on farmers' decision to switch from conventional to organic rice farming. Meanwhile, partially, the variables that considerably affect farmers' conversion decision to organic rice farming are farmer behaviors related to rice prices and productivity as well as marketing institutions. In this regard, alternative policies that can encourage farmers to convert to organic rice farming are very needed so as to further develop organic rice productivity and improve the welfare of farmers. Some of the alternative policies needed include the establishment of institutions that can guarantee the marketing continuity and premium prices for organic rice and the improvement of farmers' ability from technical aspects to increase rice productivity.

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