

# Why Organic Rice Farmers Switch Back To Conventional Farming ?

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## Abstract

Organic rice farming is the future of agriculture to achieve sustainable agriculture by considering social, economic and environmental aspects. Priangan Timur West Java Province is an area of the development of organic rice and its development performance indicates a decreasing indicator. The most extreme performance decline is the decreasing of the number of farmers involved in the organic rice farming by 83 percent. The purpose of the research is to know the main factors causing the organic rice farmers to go back to the conventional rice farming (non-organic). The research used survey method of 150 ex-organic rice farmers in 6 districts/cities of Priangan Timur West Java Province Indonesia. The results of factor analysis showed that the main cause of organic rice farmers to switch back to conventional rice farming is due the economic barriers, certification, organic rice requirements, production & institutional and technical barrier factors.

**Keywords:** Organic Rice Farming, Conventional Farming, Performance, Barriers

## 1. Introduction

Organic farming is growing rapidly in all parts of the world. The organic land area has increased since 2000 from 15 million hectares to 50.9 million hectares including the conversion area with the number of producers amounted to 2.4 million producers. More than three-quarters producers are located in the developing countries (Willer and Lernoud, 2017).

The growth of organic farming in developing countries is triggered by the preference of the consumers who want a safer food for health purpose. The development of trend/lifestyle in the community eventually drive the high demand for organic products especially in developed countries (Karki, et al, 2011; Widiarta, et al, 2011). The high demand and product price from the consumers in the developed countries have caused the import of organic products from developing countries. This gives the developing countries that export the organic products to buy it from the farmers with the premium price. However, organic products farmers still face difficulty in their plants' productivity. Thus, organic farming in the developing countries becomes socio-economic development tool supported by various national and international programs (Reddy, 2010; Twarog, 2010; Kilcher & Echeverria 2010). In 2017, the world organic products trade reached USD \$ 46.1 Billion/36.2 Billion Euro (IFOAM, 2009). In 2014, it had reached more than 60 Billion Euro (FiBL Survey, 2016).

The growth rate of organic production depends on the different and varied factors from one country to the other and from region to region (Brodt & Schug, 2008). In 2017, the total area of organic products in Asia was 3.69 million hectares, increasing by 7.5 percent to 3.97 million hectares in 2015. Meanwhile, in 2011, the total area of organic products in Indonesia was 74,034,09 ha increased 76 percent in 2015 to 130,384.38 hectares (Willer and Lernoud, 2017).

The growth of organic products in developing countries is also driven by a variety of advantages comparing to conventional farming such as protecting/maintaining the health, physical, fertility, and biological nature of the soil, enabling the ecosystems to better adapt to climate change impacts, and increasing the potential for carbon absorption from the soil (Surekha, et al, 2013; Pathak, et al, 1992; Carpenter Boggs, et al, 2000; Bhooshan, et al, 2011). Another advantage is increasing the farmers' income through higher productivity and premium prices (Surekha, et al, 2013; Reddy, 2010). Meanwhile, its social contribution is the various avoidance of hazards related to the loss of soil fertility, water pollution, biodiversity erosion, greenhouse gas emission, food scarcity and pesticide poisoning that can eventually develop healthy community (Scialabba, 2013). In principle, ecological farming system or organic farming is concerned with the importance of the ecological basis of existing farming system. Organic farming has been proposed as an important means to achieve these goals (Seufert, 2012).

In Indonesia, although organic farming including organic rice has lots of advantages and benefits, its development is relatively very slow (Mayrowani, 2012). The indicator of extreme performance decline is the decreasing number of farmers involved in the organic farming. In 2011, the number of the producer of organic farming in Indonesia reached 8,612 farmers which had decreased to 5,789 in 2015 (Willer and Lernoud, 2017). Similarly, the fact that occurred in Priangan Timur West Java Province Indonesia, the performance development of organic rice is categorized as stagnant with declining performance trend (Heryadi and Noor, 2016). Based on 2,435 farmers of organic rice in 2009, it had drastically declined to 408 farmers in 2016. The number of farmers has reduced to 83 percent. This trend is also experienced in several centers of other organic rice development in

Indonesia such as Bogor (Widiarta, et al, 2011). This situation encourages a study of the main factors that affect the farmers of organic rice to go back to conventional rice farming.

There have been many research/studies to determine factors that influence the farmer's decision to convert their agriculture to good organic farming both in developed and developing countries. Some of the factors are the environmental awareness, bright market prospect, economic benefit and health awareness as the main factor that influences the farmers' decision to convert to the organic farming (Karki, et al, 2011). Furthermore, organic farming also brings higher profit, selling price and income (Dabbert, et al, 2004; De Cock, 2005). Some of the non-economic factors are the social factor, the healthier rice quality, minimum pest and disease attack (Sukristiyonubowo, et al, 2011).

However, until now there has been no research/study explaining why farmers who have implemented organic rice farming switch back to the conventional farming practice. The purpose of this research is to deeply answer and understand the main underlying factors underlying of the farmers who have implemented organic rice farming to switch back to the conventional rice farming

## 2. Research Methodology

The research is done by using Survey method on 150 people of ex-organic rice farmers in 6 Districts/Cities in the Development Area of Priangan Timur West Java Province Indonesia consisting of District: Tasikmalaya, Ciamis, Garut, Pangandaran, City: Tasikmalaya dan Banjar. These areas are included in the West Java Province Indonesia and one of the centers of rice field to cultivate organic rice. The survey is conducted through face to face with ex-organic rice farmers to obtain all of the necessary information for the research.

The questionnaire is designed to obtain the respondents' data on the main factor that causes them to switch back to the rice farming conventional pattern. The respondents' behavior and the main reason to switch back to the conventional agriculture is then analyzed using a set of the question given using Likert Scale with (1) for strongly disagree and (5) for strongly agree. A pre-test questionnaire is given to 20 respondents of ex-organic rice farmers. After the pre-test questionnaire, several performances/indicators of agriculture business with confusing/difficult statements are given to be answered by the respondents. Then, it is removed/perfected and only several questions are taken and further analyzed.

Other than collecting the primary data from the ex-organic rice farmers, an interview is conducted with various stakeholders involved in the development of organic rice. The purpose of the interview with stakeholders is to obtain deeper additional information related to social, economic, and political issues related to the development of organic rice in the research sites. Considering the time and cost barriers, only several relevant organizations/institutions are used as information sources namely Department of Agriculture/District/City, community enterprises institution/Consultant, farmer group, exporter, and university. All of the informant resources are interviewed in the relevant place to give them a chance to speak freely in responding to various controversial issues in the development of rice organic. Applying semi-structured interview. The topic is addressed to the information factors that influence the farmers of rice organic to switch back to conventional farming.

The interview is analyzed using narrative analysis method. The results of the interview with the stakeholders are presented as additional information for the analysis results of the respondents. The narrative note is following the developing information and phenomena at that time, collecting spread out information and explaining why a certain action has happened or how a certain interaction occurs. This method is selected due to its ability to understand how someone sees and conceptualize the action.

Factor analysis is conducted to collect and reduce the number of variable in a small sum of factors showing the farmers' motive to switch back to the conventional rice farming pattern. The discriminant analysis is conducted to identify the most important variable explaining the dependent variable (Hair et al. 2010) namely the organic rice farmers' decision to switch back to the conventional rice farming

## 3. Results

Factor analysis causing the organic rice farmers to switch back to conventional rice farming

Factor analysis is used to summarize the research variables into smaller number compared to the initial number of variables without losing most of the important information contained in it and found the interrelationship between the numbers of mutually independent variables that are the cause for organic rice farmers to switch back to conventional rice farming (Sharifi, et al, 2010). The implemented computations reveal that the internal coherence of the data is appropriate (KMO = 0.558) and Bartlett's test statistical data is at 0.01 level significance (1022.413). According to Kaiser Criteria (Table 1), there are fifth factors in which the Eigen values are extracted more than 1 (Table 2).

Table 1. KMO Measures and Bartlett's Test to assess appropriateness of the data for factor analysis

KMO	Bartlett's test of sphericity		
	Approx chi-square	df	Sig
0,558	1022,413	300	,000

Table 2. Number of extracted factors, Eigen values and variance explained by each factor

Factors	Eigen value	% of variance	Cumulative % of variance
Economic barriers	2.612	14.446	14.446
Certification barriers	2.434	13.735	29.182
Organic requirements Barriers	2.212	12.849	40.031
Production and Institutional barriers	2.186	11.743	45.773
Technical barriers	1.960	9.841	55.614

The research variables are categorized into five factors by using Varimax Rotation Method (Table 2). The variables of each factor are extracted based on the data in Table 2 and described as follows: Based on the factor analysis results, it is found that the main factor causing the organic rice farmers to switch back to conventional rice farming are categorized into five groups. The first factor is called the economic barriers with the highest Eigen value compared to other factors (2,612). It explains that 16.141% of the total variances of the variables (Table 3). The second factor is called the Certification barriers. This factor has an Eigen value of 2.434, which explains that 13.735% of the total variances of the variables (Table 4). The third factor is called the Organic requirements barriers. It has an Eigen value of 2.212 and explains the 12.249% of the total variances of the variables (Table 5). The fourth factor is called the Production and Institutional barriers. It has an Eigen value of 2.186 and explains 11.743% of the total variances of the variables (Table 6). The fifth factor is called the technical barriers. It has an Eigen value of 1.960 and explains 9.841% of the total variances of the variables (Table 7). As shown in Table 2, the above fifth factors explain about 62.614% of the total variance of the research variables. In other words, 37.386% of the total variants are related to other variables that are unexplainable and have not materialized in this analysis.

Table 3. Variables loaded in the first factor using varimax rotated factor analysis

Factor	Variables	Factor loadings
Economic barriers	The price of organic price product is similar to the conventional one	0.502
	No specific marketing institution	0.893
	The difficulty of selling the products	0.778

Table 4. Variables loaded in the second factor using varimax rotated factor analysis

Factor	Variables	Factor loadings
Certification barriers	The surveillance period is too short and expensive	0.673
	The certification cost of organic rice is expensive	0.623

Table 5. Variables loaded in the third factor using varimax rotated factor analysis

Factor	Variables	Factor loadings
Organic requirements Barriers	The conversion time is too long	0.686
	Certification requirements for organic rice	0.685

Table 6. Variables loaded in the fourth factor using varimax rotated factor analysis

Factor	Variables	Factor loadings
Technical barriers	Difficulty of transporting organic fertilizer to rice fields	0.602
	Difficulty of providing organic fertilizer as recommended	0.599
	Difficulty of organic rice farming technology	0.533

Table 7. Variables loaded in the fifth factor using varimax rotated factor analysis

Factor	Variables	Factor loadings
Production and Institutional barriers	Low productivity	0.571
	Limited access and capital assistance from financial institution	0.730

#### 4. Discussion

The development of organic rice agribusiness in the research area show an unsatisfactory performance and one of the indicators is the decreasing number of the farmers involved in organic rice agribusiness and farmers re-implement the conventional rice farming. As suggested by Lampkin, (1990) and Harris, et al, (1998) that the

adoption of organic farming as an innovation will not be easy and will face various barriers such as institutional, cultural, economic social and technical barriers (Scheneberger, et al, 2002). In the case of the research area, farmers have implemented organic rice farming in some planting seasons (average organic rice farming experience of 3 years old) but switch back to the conventional pattern. This research tries to deeper answer and understand of what are the main factors underlying the farmers that have implemented organic rice farming to switch back to conventional rice farming.

The results of factor analysis show that the causing factors of the organic rice farmers to switch back to conventional rice farming can be grouped into five factors consisting of Economic barriers, Certification barriers, Organic Requirement barriers, Production and Institutional barriers and Technical barriers. These factors account for 63% of the cause of organic rice farmers to switch back to conventional rice farming. Based on the farmers' point of view, the Economic factor is the main barriers of why they return to conventional farming. The economic barrier complained by the farmers is the price of organic rice products are often similar to conventional rice price of IDR 550,000,- per quintal GKG/Dry unhusked rice (1 USD = IDR 13,500). This fact is different from those disclosed Berentsen, et al, (2012) that other factors that may affect the economic results of organic agriculture is the possibility of obtaining a higher price. In addition, Sukristoyonubowo, et al, (2011); Pornpratansombat, et al, (2011) reveal one of the most influential and profitable things when farmers adopt organic farming is obtaining higher prices. However, in reality it does not occur in this research area which also causes them to switch back to conventional rice farming. Furthermore, farmers complain that there are no product marketing institutions which are specific, credible and have sufficient financial ability to handle organic rice so that farmers who have carried out organic rice farming find it difficult to sell their products with the expected premium price. This is in accordance with the statement by Mayrowani, (2012) that organic rice in Indonesia is constrained by the limited market and lack of partnership between farmers and private companies. In general, the appropriate market access to organic products is not available (Niemeyer and Lombard, 2003).

Other factors perceived by farmers are the organic requirements and certification barriers. Rice production has to be certified in order to be claimed as organic rice. Organic food certification is a series of certificate issuance activities, as a written guarantee provided by an accredited certification institution to certify that the products have met the required standards on the organic food system. In the research area, certification institutions used are IMO (Institute for Marketecology Organic) PT Sucofindo, BioCERT, IFOAM, and INOFICE (Indonesian Organic Farming Certification). Organic certification usually performs on a farmer group scale or a combination of farmer groups. Farmers state that the certification cost of organic rice is too expensive. One period of organic rice certification issuance is valid for 3 (three) years with varying cost among certification institution, ranging from IDR 9 million to IDR 30 million. Certification cost is calculated based on the location, area, and complexity of the applicants' scope (Inofice, 2017). The high certification cost becomes one of the barriers in the development of organic rice in the research area as suggested by Mayrowani, (2012) that the barriers in organic rice development in Indonesia among others, is because of the relatively expensive cost of organic product certification for the small farmers. This statement is similar to Padel and Lampkin, (1994), Padel (2001) that when farmers are going to convert to organic production, they will be faced with institutional barriers in the form of difficulty to obtain loans and certification barriers. This is also the main cause that the organic rice farmers are returning to conventional rice farming. The first time cost of certification in the research area is handled by the Agricultural Service and exporters, but the next certification fee cost is borne by the farmers so this is burdensome. During the validity of an organic certificate for 3 years, annual surveillance and renewal of certificates must be performed annually. There are also unscheduled visits or risk-based visits (consumer complaints, suspicions etc.) with/without prior notice to business actors. This surveillance fee varies between IDR 7.5 million - IDR 15 million. Furthermore, to switch from conventional to organic farming also requires a conversion time of at least 2 years, which means that that new farmers can claim organic rice after this conversion period and this is a problem for farmers. So these factors are often complained by farmers and become the cause of organic rice farmers to switch back to conventional rice farming.

Another factor is related to technical barriers due to the farmers' difficulties in providing raw materials for organic fertilizer derived from organic materials such as compost fertilizer, manure, green fertilizer, liquid fertilizer for each planting season. This is in accordance with the research results by Ristianingrum (2012); Sharifi, et al, (2010) that the limited availability of organic material is a barrier in the interrelated system of organic rice agribusinesses and the weakness of access to obtain inputs is the fourth order of barriers on organic farming. Another technical problem is transporting to the location/plot of the rice field. If the farmer compares with the same nutrient content, the farmer has to carry the number of sacks of organic fertilizer. In the end, the difficult supply and transportation difficulties cause organic fertilizer quantity/dosage not in accordance with the recommendation yet. As a benchmark, the average bulk organic fertilizer dosage such as manure/conventional compost for the seasonal crop is about 10-20 ton/ha/planting (Unsur Tani, 2017). To this day, the new administration is around 30-40 percent of the recommended dosage. Other causes are farmers still consider the organic rice farming technology is more complicated than conventional rice farming, such as water regulation

that must be free from conventional rice farming, maintenance that should be more meticulous, etc. These factors ultimately led to farmers who had already planted organic rice to switch back to conventional rice farming.

The last and very important factor from the farmer's point of view to switch back to conventional rice farming is production and institutional barriers. The technical factors barriers that have been previously conveyed in the end lead to a low productivity of organic rice is and sometimes lower when compared to conventional rice farming. The average productivity of organic rice achieved is about 5.4 tons/ha while conventional rice is about 5.8 tons/ha. This is not in line with farmers' expectations and information obtained previously that organic rice productivity is higher than that of conventional rice farming. The lower productivity of organic products is in line with the statement by Moudry, et al, (2008), Mader, et al, (2002) that organic farm results are generally lower by about 20% compared to conventional farming.

The low productivity with narrow land ownership along with the similar price of organic rice production with the conventional rice also causes the economic risk for the farmers, which cause the organic rice farmers income is not bigger than conventional rice farming. This is different from the research result conducted by Sukristoyonubowo, et al, (2011) that the organic farming has the advantage of obtaining better income than conventional rice farming. It is added to the fact that the access and capital assistance from the financial institution in the research area are very limited. Thus, the production and institutional barriers also cause the organic rice farmers to switch back to conventional rice farming.

## 5. Conclusion and Recommendations

Based on the research that has been conducted, it is concluded that the return of organic rice farmers to conventional rice farming is caused by economical, certification, organic rice requirements, production and institution as well as technical barriers. Although this research is only a case study, there may be similarities to problems faced by farmers in other various areas. To increase the performance of organic rice development as expected, the following things are recommended, first: the availability of the production input (organic fertilizer, etc.) must be guaranteed in accordance to the recommendation and can be guaranteed to arrive at the farmers' rice-field location accompanied by the provision of intensive counseling about the correct organic technology to increase the organic rice productivity. Second: credible and financially capable marketing institutions should be created to accommodate the products of organic rice farmers with the premium price and partnering with exporter companies. Third: Government and private company support is needed especially for capital assistance and handling the high-cost of certification of organic rice to be reached by farmers' group/financing sharing.

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