WHY ARE FARMERS WILLING TO JOIN PARTNERSHIPS IN ORGANIC RICE? CASE IN NGAWI ORGANIC CENTER COMMUNITY, EAST JAVA

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Abstract: Organic farming is more profitable because of the increasing demand and high product prices. However, it is not easy for farmers to decide on rice farming organically. Farmers faced obstacles such as limited capital, lack of knowledge about organic technology, and no price guarantee for organic farmers who have not been certified organic. It is necessary to develop some policies such as institutions. A partnership is one of the institution's solutions for farmers to increase their willingness to join organic rice farming. This research was conducted in Ngawi Regency, East Java, from March 2020. Ngawi Organic Center Community (KNOC) is a partner institution with experience in pioneering and fostering organic farmers. The research aims to analyze (1) the factors that influence organic rice farmers for decision-making partnership; (2, the mechanism of organic rice partnership; and (3) the benefits farmers get from the partnership. Logistic Regression used to analyze the factors that influence the farmers' decisions. Descriptive analysis is used to investigate the mechanism of organic rice partnership between organic rice farmers and KNOC. The descriptive analysis also describes the benefits of partnerships received by farmers. The study results show that farming experience, land area and frequency of extension significantly affect farmers' decision making. The organic rice partnership mechanism regulated in a written contract, with the Agribusiness Operational Cooperation partnership pattern. The high price of organic rice is the most profitable partnership benefit for farmers (81,67%).

Keywords: *decision making, organic rice, partnership, the benefit of a partnership*

INTRODUCTION

The emergence of organic farming is considered one of the solutions to the destructive consequences of implementing the green revolution. According to Syekfani (2005), implementing the green revolution in Indonesia initially gave good results. However, excessive use of fertilizers and pesticides causes environmental and social problems such as water and air pollution, accumulation of chemical residues and dependence on chemical inputs (Shiva, 1991). Organic agriculture is a holistic production management system that improves and develops ecosystem health, including biological cycles and soil biological activities (IFOAM, 2005).

The advantages of organic farming systems are expected to overcome Indonesia's agricultural problems. However, the application of organic farming has encountered various obstacles. The process of land convention takes a long time, the cost of organic certification is quite expensive, and intensive plant care requires more labor and costly labor costs (Herawati et al, 2014). Some policies must be developed to address this issue, such as an institution. A partnership is an institution solution for farmers to increase their willingness to join in

organic rice farming. A partnership is a cooperation with mutual need, mutual strengthening, and mutual benefit.

Currently, many commodities are cultivated organically, one of which is rice. Padi The area of organic rice land in 2018 reached 53,974 hectares and was the second-largest in Indonesia after coffee which was 60,045 hectares (AOI, 2019). Organic rice is also the second most commonly purchased organic commodity (David and Ardiansyah, 2017). It is inextricably linked to rice's role as the staple food of the majority of Indonesians. The growing public awareness of eating healthy foods free of chemical contamination is driving up demand for organic rice products.

One of the institutions partnered with organic rice farmers is the Ngawi Organic Center Community (KNOC). This institution is located in the western part of the province of East Java. This institution has experience in fostering farmers in implementing organic farmers since 2010 and has received organic certification from LeSOS (Lembaga Sertifikasi Organik Seloliman). The rice harvested area of Ngawi in 2019 reached 122.500 hectares, with production reaching 777.190 tons (BPS, 2020). With an area of rice fields coming to 38,74% of the total area, Ngawi has an excellent opportunity to develop organic rice.

Small farmers dominate farmers in Ngawi. Most Indonesian smallholders grow crops on less than 0,79 hectares of land (Sahara et al. 2011). Small farmers generally experience difficulties accessing limited capital and technology, high farm input prices, low output selling prices, and marketing uncertainty. The existence of a partnership between organic rice farmers and KNOC is expected to be able to overcome these problems. Although partnerships are seen as a solution to these problems, many farmers still decide not to join organic rice partnerships.

The organic rice partnership between farmers and KNOC uses a valid contract system for 1 growing season. If the farmer wants to continue the cooperation, the farmer must renew the partnership contract. This contract system makes the number of partner farmers uncertain or fluctuating. The sustainability of the organic rice partnership cannot be said to be good because some farmers choose to stop partnering and return to conventional farming. In 2014 the number of farmers who participated in the partnership was 41, but currently, the number of farmers who partner is only 15 people (Widodo et al, 2018). To create a sustainable partnership, the causes of this decrease in the number of partner farmers must be investigated. Based on the research background, the question arises "what are the factors that cause farmers to join partnerships in organic rice?'. So the research aims to analyze (1) the factors that influence organic rice farmers for decision-making partnership; (2) the mechanism of organic rice partnership; and (3) the benefits farmers get from the partnership.

RESEARCH METHODS

1. Data Collection And Analysis

The method of the research is a case study. The research was conducted in Ngawi Regency, East Java. In this area, rice farmers cultivate rice organically and conventionally. Organic rice farmers are farmers who partner with KNOC. Non-partner farmers are rice farmers who produce rice conventionally.

The data used in this research are primary and secondary data. Primary data was obtained by interviews through questionnaires. Primary data taken includes demographic data and farmer characteristics. Secondary data is used to support primary data from Indonesian Organic Alliance and the Local Department of Agriculture and Food Security. The selection method was conducted by simple random sampling to get 30 respondents. The number consisted of 15 partner farmers and 15 non-partner farmers. Data was collected on January – March 2020.

2. Logistic Regression Analysis

Logistic regression analysis was used to analyze the factors that influence farmer decision-making partnership. This analysis describes the relationship between the dependent variable and several independent variables that affect it. The dependent variable in the logistic regression model is a binary category, which has a value of "1" and "0" or "yes" and "no".

The decision to become partner and non-partner farmers is considered as a dependent variable and is transformed into two nominal variables, namely "1" for partnered farmers and "0" for non-partner farmers. The independent variables used are factors that are thought to influence organic rice farmers to partner or not. The independent variables include farmer's age, farming experience, land area, farmer's education level, number of families and frequency of attending extension. The following is a logistic regression equation model for the analysis of factors that affect partnerships:

$$Yi = Ln\left(\frac{Pi}{1-Pi}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + e$$

Description =

Yi = Partnershup participation

   (1= partner farmer, 0 = non-partner farmer)

X_1 = Farmer's age (year)

X_2 = Farming experience (year)

X_3 = Land area (Hectar)

X_4 = Farmer's education level (year)

X_5 = Number of family (person)

X_6 = Frequency of attend extension (times)

α = Constanta

β = coefficient for each independent variable

e = Error

Parameter testing needs to do to check whether the model used is suitable. Some of the parameter tests carried out are:

a.   Goodness of Fit (G-test)

After estimating the logistic model, the next step is to test the model's suitability because the model formed must produce a consistent estimated value. The G-test statistic is a maximum likelihood ratio test used to test independent variables' role in the model simultaneously. The hypotheses used in the G test are:

$$\text{G-test} = -2 \, Ln \left[\frac{likelihood \ (model \ A)}{likelihood \ (model \ B)} \right]$$

Description =

Model A = model consisting of just one constant

Model B = model consisting of all variables

b.   Wald Test

The Wald test is used to test the significance of the logistic coefficient by comparing the Wald value obtained from logistic regression with the Chi-square table at degrees of freedom 1.

$$W = \left\lfloor \frac{\beta i}{SE \ (\beta i)} \right\rfloor$$

Description =

W = Wald value

β = Variable independent coefficient estimation

Hypothesis:

1. H_0 = independent variable has no significant effect on farmers' decision to join organic rice partnership.

2. H_1= independent variables significantly affect farmers' decisions to join organic rice partnerships.

The decision-making criteria used are: H_0 is rejected if the significance value is $\leq 0,15$, which means that the independent variable has a significant effect on farmers' decision making. H_0 is accepted if the significance value is $> 0,15$, which means that the independent variable has no significant impact on farmers' decisions.

3.   **Descriptive Analysis**

Descriptive analysis used to analyze the mechanism of organic rice partnership and benefits of collaboration in organic rice farming. Respondents chose the help of the partnership which were considered the most important. The benefits of a partnership include: 1) the level of price; 2) existence of marketing guarantee; 3) healthy products and 4) easy access to farming capital.

RESULTS AND DISCUSSION

1.   **Characteristic Of Respondent**

Characteristics of respondents in this study include the age of farmers, education level and farming experience. There are two age categories, namely the very productive age of 15 to 49 years and the productive age of 50 to 64 years. Meanwhile, non-productive age is more than 64 years old. Both partner farmers and non-partner farmers are dominated by 50-64 years. These conditions indicate that the respondents are in productive age, where respondents still have the physical ability to manage their farming.

From the table below, partner farmers' education level is higher than non-partner farmers. The story of education will affect the ability of farmers to make decisions and absorb knowledge. Farmers with a higher level of expertise are more willing to make decisions to cultivate organic rice because they know the benefits for body health and the environment. A higher level of education also creates the ability to apply innovation and technology better.

Farming experience will describe the ability of farmers to solve problems based on the expertise experienced by farmers during their farming. Farmer's agility to act and think quickly in making the decision is also based on the experience that has been passed while being a farmer. Farming experience influences farmer's decisions in choosing the technology used, namely: with organic or conventional applications. Farming experience will be associated with a change in behavior with new technology. Based on the study results, non-partner farmers have ample farming experience (more than 10 years). It is presumably because experienced farmers do not want to take risks that affect their profits. So, they choose not to join the organic rice partnership.

Non-partner farmers have a more vast land area of 0,51-1,00 hectares as much as 60%. At the same time, the partner farmer's land area is dominated by

farmers with a land area of 0,26-0,50 hectares, as much as 66,67%. The table below describes the characteristics of respondents in the research area:

Table 1. Characteristic of Partner and Non-partner Farmers

Attributes		Partner Farmer		Non-partner Farmer	
		Number	%	Number	%
Age (year)	15-49	6	40	4	27
	50-64	8	53	6	40
	65-70	1	7	5	33
Level of Education (year)	No formal education	0	0	5	33
	Elementary school	6	40	6	40
	Senior high school	6	40	4	27
	College	3	20	0	0
Farming Experiences (year)	1-5	6	40	0	0
	6-10	9	60	4	27
	>10	0	0	11	73
Land Area (hectare)	≤ 0.25	3	20	3	20
	0,26 - 0,50	10	66,67	3	20
	0,51 - 1,00	2	13,33	9	60

Source : Primary data (processed), 2021

2. Factor Influencing Farmers For Decision Making Partnership

Several factors influence the decision of farmers to join organic rice partnerships. A partnership can be seen as an innovation in institutions. Concerning deciding to accept or reject an innovation, internal factors that influence include: the status of farmers; farmer's age; farmer education and; the number of family members (Soekartawi, 1994). According to Glover and Kusterer (1990), external factors are the existence of marketing guarantees; price certainty; technology transfer; provision of production facilities; open access to capital, and direct counseling from partner companies.

According to Rodgers (1983), the characteristics of someone will influence the actions and the person's behavior to influence the farmers decision-making to join partnership. In this study, the factors that influence farmers' decision making include 6 elements as listed in the following table:

Table 2. Regression Results of the Logistics Regression Model Factors Affecting Farmer Decision Making

Variable	B	Wald	Sign	Odd Ratio
Age (X_1)	0,057	0,445	0,505	1,058
Farming Experience (X_2)	-0,228	2,268	0,132**	0,796
Land Area (X_3)	-8,130	4,152	0,042*	0,001
Level of Education (X_4)	-0,173	0,508	0,476	0,841
Number of Family (X_5)	0,055	0,003	0,954	1,056
Frequency of Extension (X_6)	1,594	2,187	0,139**	4,924
Nagelkerke R-Square (R^2)		0,703		
Chi-Square		5,639		
Hosmer & Lemeshow		0,688		

Source : Primary data (processed), 2021

Description:

* Significant level of 5 %

** Significant level of 15 %

From the results of data processing, the value of Nagelkerke R-Square (R^2) is 0.703. This shows that the independent variables included in the logistic model are able to explain the dependent variable (Y) by 70%. The other independent variables of 30% are not included in the model. The value of Hosmer and Lemeshow indicates the goodness of fit test. Hosmer and Lemeshow are used to predict whether the

regression model is sufficient to explain the data. Based on the Hosmer and Lemeshow test results, a value of 5,639 was obtained with a significance value of 0.688. The significance value is greater than 0.15. It shows that at the level of 85% it can be believed that the logistic regression model can explain the data so that further analysis can be carried out.

Wald test is used to test the effect of each independent variable on taking farmer's decision to partner with organic rice. Testing on each independent variable (X) to variable dependent (Y) is determined by the significant value in the variable table in the equations. A calculated significance value < 0.15 means significant, indicating that the independent variable influences farmers' decision making. Based on the data in table 2, the independent variables that significantly influence farmer's decision making to join organic rice partnerships are farming experience, land area and frequency of attending extension. Meanwhile, farmer's age, education level and number of families have no significant effect on farmers' decision making. The factors that have a significant effect explained bellow:

A. Farming Experience

Farming experience significantly affects farmers' decisions to join partnership with significance value 0,132 (smaller than α=0,15). Farming experience has a negative coefficient value, meaning that the longer farmers work in farming, the farmers tend not to choose organic rice farming partnerships. Farming experience has an odd ratio value of 0.796. This odd ratio value means, for every one year increase in the length of farming, the chances of farmers choosing partners in organic rice are 0.978 times than before (*ceteris paribus*).

Non-partner farmers have longer farming experience than partner farmers. In general, farmers are reluctant to take risks to try other agricultural systems because they are comfortable with the farming system that has been running so far. Non-partner farmers consider their farm income to be profitable enough so they are reluctant to switch to organic rice partnerships.

B. Land Area

The coefficient of land area is negative, meaning that the wider the land owned by farmers, the farmers tend not to choose to do organic rice partnerships. Land area has an odd ratio value of 0,001. This odd ratio value means that for every additional 1 hectare of land area, farmers' chance not to choose organic rice partnerships is 0.001 times (*ceteris paribus*). Land area variable significantly

affects farmers' decisions to join partnership with significance value 0,042 (smaller than α=0,05).

The average land area of partner farmers is 0.35 hectares, while the average land area of non-partner farmers is 0.59 hectares. The land area of organic rice partner farmers is narrower, because farmers generally do not want to experience a decline in production during the transition period. So that farmers will switch to conventional farming, Research by Yulistiono and Hapsari (2019) also shows that land area influences farmer's decisions to join partnership.

C. Frequency of Extension

The coefficient of frequency of extension is positive, which means that the more often farmers participate in extension the farmers will tend to choose to join the organic rice partnership. Frequency of extension has an odd ratio value of 4,924. This odd ratio value means that for every additional extension activity that farmers participate in, farmers' chances to join the organic rice partnership are 4,924 times than before (*ceteris paribus*).

Frequency of extension significantly affects farmers' decisions to join partnership with significance value 0,139 (smaller than α=0,15).In organic farming extension activities, there is a process of knowledge and information transfer that can increase farmer's interest in cultivating organic rice. KNOC usually holds a meeting for extension or coaching at least 1 time per planting season. Intensive extension activities will shape farmers' perception, making it easier to make decisions (Indraningsih, 2011). This statement is supported by Hamrat (2018) that extension will shape aspects of farmer's knowledge and attitudes, thus influencing the adoption of organic farming technology.

3. **Mechanism Of Organic Rice Partnership Implementation**

The organic rice partnership at KNOC is regulated in a written cooperation contract. Each side has rights and obligations that must be obeyed in order to fulfill the principle of mutual benefit.

Farmers who want to join as partners must fill out a registration form that contains the identity of the farmer and the condition of the land. According to the SOP, farmers will also be given a stamped statement letter stating the farmer's ability to carry out organic rice farming. KNOC has an internal monitoring form for each partner farmer. Internal supervision is carried out to ensure farmers do not violate company regulations. If the farmer commits a violation, then the farmer must be ready to accept

sanctions from the company, namely the farmer's expulsion from the partnership.

The farmers themselves must provide the land used for organic rice cultivation, while the KNOC provides production facilities such as rice seeds, organic fertilizer, local micro-organism, and biological agents. KNOC also conducts coaching and training to improve farmers' ability in organic rice cultivation. Farmers who initially apply conventional rice cultivation must go through a period of land conversion. Land conversion is the transition time rice farmers need to switch to organic systems with conventional systems. The length of the land conversion period varies for a minimum of three planting seasons (one year). During the transition period, the dosage of chemical fertilizers is gradually reduced. All stages during the conversion do not use chemical pesticides but use organic pesticides. The land conversion period is declared complete after the process ends with a final check from the KNOC.
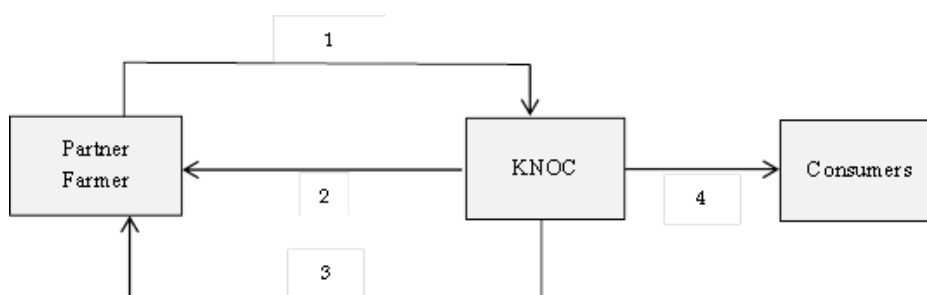

Figure 1. Organic Rice Partnership Scheme
Source: Primary data (processed), 2021

Description:
1 = Yields, land and labor
2 = Input production and guidance
3 = Harvest payment

Availability of land and labor is the responsibility of farmers. Farmers are also responsible for the organic rice cultivation process. Partner farmers are also allowed to take part of the harvest for family consumption. Yields are deposited into the KNOC warehouse in the form of grain.

KNOC provides production inputs such as seeds, organic fertilizers, local micro-organisms and biological agents. KNOC also provides technology to farmers in the form of organic seeds and laboratories for the development of biological agents and land monitoring. The purchase of harvested rice is carried out according to the agreed price, namely IDR 5.000/kilogram for white rice and IDR 7.000/kilogram for black rice. Rice processing, packaging and marketing to consumers are also the responsibility of KNOC.

According to the Deptan (2002), there are 5 types of partnership patterns in agricultural businesses: the plasma core partnership pattern; subcontract; general trading, agency, and agribusiness operational cooperation. Sumardjo et al. (2004) stated that differences influenced differences in partnership patterns in implementation or the mechanism for implementing the partnership, the rights and obligations that need to be carried out by each side to the partnership. Partnership pattern in agricultural cooperation is influenced by the role of each side rather than the type of commodity.. Based on the scheme in figure 2, the organic rice partnership pattern between farmers and KNOC is Agribusiness Operational Cooperation. Partnerships with Agribusiness Operational Cooperation patterns are also found in research conducted by Heliawaty et al (2021); Rasmikayati (2020); Jusuf et al (2019).

4. **Benefits Of Organic Rice Partnership For Farmers**

Partnership is cooperation between parties with mutual need, mutual strengthening and mutual benefit. Norjaya (2001) stated that conceptually, at least six benefits can be obtained by implementing a partnership, namely the achievement of high productivity; achieving efficiency; quality, quantity and continuity assurance; risk management; social benefits and economic resilience.

In this study, the benefits of partnership received by farmers are 1) the level of price received by farmers; 2) existence of marketing guarantee; 3) healthy/quality agricultural products and 4) easy access to farming capital. The explanation of organic rice partnership benefits are:

Table 3. The Benefits of Organic Rice Partnership

Partnership Benefits	Amount	Percentage (%)
Price Level	6	40
Market Guarantee	4	26,67
Healthy Product	2	13,33
Ease of Capital	3	20
Total	15	100

Source : Primary data (processed), 2021

a. Price Level

40% of farmers stated that the price level of their yields was the most important benefit of the partnership. By joining the organic rice partnership, KNOC will buy farmer's yields for IDR 5.000-7.000/kilogram. While the price of conventional rice is IDR. 4.300-4.500/kilogram. This price difference also causes differences in farmer's income levels. Partner farmers who grow organic rice have higher income levels than conventional farmers. It is similar to the results of research by Heryadi *et al* (2021); Subakti and Kurniawan (2015); Surekha *et al* (2013); Berentsen *et al* (2012) and Reddy (2010).

b. Market Guarantee

Farmers who participate in the partnership will deposit their harvests to KNOC. The organic rice will then be processed and marketed by KNOC. Marketing is done directly through agents, resellers and organic product exhibitions. Online marketing is done through social media and market places. 26,67% of farmers stated that the market guarantee is very profitable because farmers do not need to market their yields. In contrast to rice farmers who do not follow the partnership, they have to sell their products. Fidyansari *et al.* (2016) and Sulistyowati (2004) stated that market guarantees make it easier for farmers to sell their products.

c. Healthy Product

Partner farmers cultivate rice organically by complying with the Standard Operating Procedures (SOP) set by the organic certification institution. During organic rice cultivation, KNOC will supervise partner farmers. Organic agricultural products are free from pesticides and chemical fertilizers from chemical contaminants. Therefore, the product produced is also healthier for humans. 13,33% of farmers choose healthy products as the benefits of the organic rice partnership. Healthy products also make farmers interested in continuing to cultivate organic rice (Andriani *et al.* 2018) and Dalmiyatun *et al* (2018).

d. Ease of Capital

KNOC provides convenience to farmers in the availability of various production inputs, such as seeds, organic fertilizers, local micro-organisms and biological agents. If the farmer does not have capital at the beginning of planting, then the KNOC will first lend the inputs. The input costs used by the farmers will be deducted from the payment for the farmer's yields. The benefit of partnership in the form of capital ease similar to Sulistyowati (2004) research. Yekti *et al* (2020) stated that capital is one factor that encourages farmers to partner with companies.

CONCLUSION

The conclusions of this study are:
1. Farming experience, land area, and frequency of extension significantly affect farmers' decisions to join organic rice partnerships. While the variables of farmer's age, farmer's education and number of family have no significant effect on farmer's decisions.
2. The mechanism of the organic rice partnership is regulated in a written contract and the pattern of partnership is Agribusiness Operational Cooperation.
3. 40% of farmers stated that the most preferred partnership benefit is the price level of organic rice, because it will increase farmer's income levels.

Suggestions that can be given in this study are:
1. Organic rice partnerships need to be developed by increasing partner farmers' number by providing agricultural extension and assistance in organic rice farming.
2. KNOC needs to maintain or increase the price level of organic rice to be economically profitable.

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