RICE FARMERS' PERCEPTION AND ATTITUDE TOWARD ORGANIC FARMING ADOPTION

Persepsi dan Sikap Petani Padi terhadap Niat untuk Mengadopsi Usaha Tani Organik

Ashari[1*], Juwaidah Sharifuddin[2], Zainal Abidin Mohammed[2], Rika Terano[2]

[1]Indonesian Center for Agricultural Socio Economic and Policy Studies
Jln. A. Yani 70, Bogor 16161, Jawa Barat, Indonesia
[2]Department of Agribusiness and Bio-Resource Economics,
Universiti Putra Malaysia, Serdang 43400, Selangor, Malaysia
**Corresponding author. E-mail: ashari_sp@yahoo.com*

Diterima: 14 Januari 2016 Direvisi: 10 Februari 2016 Disetujui terbit: 14 Maret 2016

ABSTRAK

Pada awal abad ke-21, gaya hidup "*kembali ke alam*" menjadi tren karena orang lebih sadar terhadap dampak negatif penggunaan input kimia pertanian. Fenomena ini menyebabkan konsumen, terutama yang berpenghasilan menengah atas, untuk mengonsumsi makanan sehat. Hal ini menyiratkan bahwa pertanian organik memiliki prospek cukup baik di masa mendatang. Namun demikian, minat petani untuk menjalankan pertanian organik ternyata masih rendah yang ditandai dengan lambatnya adopsi. Review literatur mengungkapkan bahwa persepsi terhadap karakteristik inovasi memiliki kontribusi yang nyata terhadap perilaku adopsi. Tujuan utama penelitian adalah untuk menguji pengaruh persepsi petani, yaitu persepsi kegunaan teknologi, risiko, kepedulian lingkungan, dan sikap terhadap niat mereka untuk mengadopsi usaha tani padi organik. Penelitian ini melibatkan 600 petani padi sebagai responden di Kabupaten Sragen, Jawa Tengah. Responden dikelompokkan menjadi dua kategori, yaitu petani semiorganik dan konvensional. Penggalian data dilakukan pada Mei–Agustus 2015 menggunakan kuesioner terstruktur. Penelitian menunjukkan bahwa persepsi tentang kegunaan teknologi, kepedulian lingkungan dan sikap berpengaruh positif dan nyata terhadap niat adopsi usaha tani padi organik, baik pada petani semiorganik maupun konvensional. Namun, persepsi terhadap risiko berpengaruh negatif dan nyata pada petani konvensional, tetapi tidak nyata untuk petani semiorganik. Disimpulkan bahwa persepsi dan sikap terbukti memiliki pengaruh yang signifikan terhadap niat adopsi. Oleh karena itu, untuk meningkatkan tingkat adopsi diperlukan upaya pemerintah untuk membangun persepsi dan sikap positif petani terhadap usaha tani organik. Petani juga membutuhkan dukungan dari beberapa pihak untuk mendorong mereka agar turut terlibat dalam praktik usaha tani organik.

Kata kunci: *pertanian organik, persepsi petani, proses adopsi, niat berperilaku*

ABSTRACT

Back to nature lifestyle emerges as people were more aware against the adverse impacts of agro-chemical inputs in the early 21st century. This phenomenon has led the consumers, particularly for upper-middle income, to consume healthy foods. It implies that the organic farming has a good prospect in forthcoming years. However, the intention of farmer to practice organic farming is still low as indicated by slow rate of adoption. The literature review reveals that perception on innovation characteristics has a significant contribution on adoption behavior. Objective of this study is to examine the farmers' perception, namely perceived usefulness, perceived risk, environmental concern, as well as attitude affecting their intention to adopt organic farming. This study involves 600 rice farmers as respondents in Sragen Regency, Central Java. The respondents were grouped into two categories namely semi-organic and conventional farmers. The data were collected through a structured questionnaire in May–August 2015. The results show that the perceived usefulness, environmental concern, and attitude positively and significantly affect intention to adopt rice organic farming from both of semi and conventional farmers. Meanwhile, the perceived risk influences negatively on intention to adopt organic rice farming merely for conventional farmers. It is concluded that the perceptions and attitude have significant effect on intention. Therefore, efforts should be undertaken to raise positive farmers' perception and attitude. Farmers also need supports from several parties to encourage them to involve in organic rice farming.

Keywords: *organic farming, farmer's perception, adoption process, behavioral intention*

INTRODUCTION

Entering the 21th century, the issue of organic farming became popular in Indonesia. In such era, the "*back to nature*" lifestyle was emerged whereby people are more aware against the adverse impact of chemo-synthetic inputs (Jahroh 2010). The awareness has led the consumers (particularly for upper middle-income) to choose a safe food ingredient for health and eco-friendly reason. This phenomenon is potential to engender the increase of organic product's demand (Mayrowani 2012).

The government has also supported organic farming development; one of the efforts was by launching **'**Go Organic 2010' program in 2001. According to Budianta (2004), the mission of program was to realize eco-agribusiness development through organic farming development, while its objective was to increase food security and social welfare. The activities of such program consist of (1) development of organic agriculture technologies, (2) formation of farmer groups, and (3) marketing strategies of organic products. It was expected that in 2010 Indonesia became the world organic market players and also increased the farmers' income (Hidayat and Lesmana 2011).

Actually, prior to this program some farmer groups in certain regencies in Central and West Java Provinces have initiated organic farming practice since 2000. However, the development of organic farming was slow. Most farmers was not quite interested to perform such farming system since they have not recognized its benefits yet, especially in terms of soil quality improvement (Utami and Handayani 2003; Sugiyanto et al. 2006).

The increased public awareness toward food safety leads to the rise of the demand for organic food. In other words, it implies that the organic product has a good prospect in the future. But, the fact denotes the farmer's response or interest to practice organic rice farming is relatively low. It is indicated by the slow adoption rate among paddy farmers. The question arises is why the farmers are "reluctant" to adopt organic farming. Referring to Rogers (2003) in this case, organic farming system was called as an innovation. He defines the innovation as "an idea, practice, or project that is perceived as new by an individual or other unit of adoption." Rogers (2003) also proposed that farmer's perception toward innovation characteristics/ attributes is very critical in adoption. Thus, farmer's perception on organic farming attributes is essential. If they perceive that the organic farming has many advantages compared to previous technology, the adoption will occur and vice versa.

According to Rogers (2003) the adoption is about a decision-making process. Farmers will undergo a stage or some stages of being aware or knowledgeable of organic farming technology and build a positive or negative perception toward such technology. Further, he mentioned there are five characteristics of innovations; those are relative advantage, compatibility, complexity, trialability, and observability. Individuals' perceptions on such characteristics will determine the rate of adoption. These five qualities determine between 49 and 87 percent of the variation in the adoption of new products.

Meanwhile, Davis (1989) who proposed the theory of Technology Acceptance Model (TAM) has formulated simpler characteristics of technology, namely perceived usefulness (PU) and perceived ease of use (PEU). These characteristics (variables) had significant correlation with behavioral intention. PU affects behavioral intention to adopt a certain technology directly or through the attitude as mediator. The result of study of Wang and Liu (2016) demonstrated that attitude itself (both cognitive and affective) also positively influence behavioral intention.

Some literatures revealed that organic farming was closely associated with environmentally friendly issue. For instance, Lampkin and Padel (2004) mentioned that organic farming was perceived as a part of the solutions to address environmental degradation. Meanwhile, Anderson (1995) claimed that environment concern and health problem aroused by conventional practice had a significant role in generating the sustainable agriculture movement. Maurer (1997) in Khalidi et al. (2007) also found that environmental rationale was a notable factor for conversion and the improved social acceptance of organic farming. Therefore, the farmers who have better awareness on environmental concern will have higher intention to engage organic farming.

Further, the technology adoption process usually encounters a risk which implies that the perception of risk against technology also potentially influences the adoption behavior, particularly for small farmers. Barry (1984) stated that small farmer was more susceptible to the risk. High farmers' perception on the risk reduce their perception toward technology's advantages (Gefen et al. in Horst et al. 2006). According to Padel (2001) the low risk of technology is one of

the characteristics that should be fulfilled by an innovation in order to be adopted easily.

In order to understand comprehensively about the adoption process of organic farming, it requires indulging the factors those affect the intention to adopt. It is assumed that intention is a proxy of adoption behavior. Assessing these factors will be fruitful to formulate the strategy to accelerate the adoption rate among paddy farmers. The aims of this study are (1) to explore the perceptions, attitude, and intention of farmers against organic rice farming; and (2) to examine the effect of perception and attitude of farmers toward their intention to adopt organic farming.

RESEARCH METHOD

Conceptual Framework

There are various factors that contribute in the growth of agricultural productivity; and one of the most pivotal is technology. According to Sunding and Zilberman (2000), technology change was a primary element that shaped agricultural sector in last 100 years. In the period, tremendous change in production pattern have occurred in worldwide. Cassman (1999) revealed that the rapid growth in agricultural productivity in the mid 1960's was primary as a result of four types of technological advancements, namely improved germ-plasm, increased fertilizer use, double cropping, and irrigation. Due to the importance of technology, the process of technology adoption in agricultural sector has become an attractive topic to be explored.

According to Rogers (2003) adoption process is "*a mental process through which an individual passes from hearing about an innovation to final adoption*". The adoption process in practice does not occur instantaneously. For instance, in case of farmer's decision to accept or reject a new technology, they will consider several phases and involves sequence of thoughts and decisions. Feder et al. (1985) proposed that to obtain an accurate analysis of adoption it requires an appropriate quantitative definition. For instance, such definition should be distinguished between individual or farm level adoption and aggregate adoption.

The adoption process usually involves human behavioral aspect, so it is quite complicated and needs a comprehensive understanding to uncover the determinant factors underlying the adoption–decision making. Ibnu and Hutabarat (2012) stated that the paramount objective of technological innovation was the technology that would be used by farmers. But, indeed it was not easy to predict whether the adoption would truly happen in the future. Nevertheless, it did not imply that farmers' technology-adoption behavior in the future could not be predicted.

Previous studies showed that behavioral intention could be able as a measure of the strength of one's willingness to exert effort for a certain behaviors (Ajzen 1991; Mathieson 1991; Harrison et al. 1997; Bhattacherjee 2000). According to Ajzen (1991), intentions are markedly appropriate for behavior prediction. It implies that the stronger an individual's intention to undertake a behavior, the more probably the individual will execute that behavior. Hence, the prediction of farmers' actual behavior in technology adoption is applicable through measuring their strength of intention for adoption.

As a conceptual framework, in current paper the perception of usefulness (PU), attitude, environmental concern (EN), and perceived of risk are suspected as determinants of intention to adopt organic farming. Perceived of usefulness is defined as "*the degree to which a person believes that using a particular system would enhance his or her productivity*" (Davis 1989). Based on this definition, Davis et al. (1989) and Taylor and Todd (1995) found PU was a major determinant of usage behavior and intention. Subramanian (1994) reaffirmed that PU had a direct effect on usage behavior.

Attitude is defined as *"the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question*" (Azjen 1991). In other words, attitude reflects feeling of favorableness or unfavorableness to perform a certain behavior (Taylor and Todd, 1995). Attitude has been identified as a cause of intention (Suki and Suki 2011). In addition, environmental concern is meant as "*altruism toward other human being to incorporate both self-interest or egoism, and concern with other species or the biosphere itself*" (Stern et al. 1993). Meanwhile, perceived of risk is "*the one's perception of the uncertainty ad adverse consequence of desired outcome*" (Fu et al. 2006). As aforementioned, these variables are also expected to have effect in terms of farmer's intention to adopt organic farming.

Data Collection

The study was conducted in Sragen Regency, Central Java Province, in May–August 2015. This regency was selected as research

site with judgment as the center of organic rice farming and it has potency to grow steadily. In the regency, the certified organic rice farmer actually has been existed; however, most of the farmers remain as conventional and semi-organic farmers. Since the objective of this study was related to behavior intention to adopt organic farming, the selected respondents were not the organic farmers, but the semi-organic and conventional farmers instead.

Data collection process was carried out through face-to-face interviews using a structured questionnaire. The selection of respondents was undertaken by multistage sampling method. In the first step, there are eight districts as main rice producer areas selected randomly to obtain five districts. Based on the selected districts, subsequently was chosen randomly two villages for each district. After the villages were identified, then the sampling frame was generated by listing all of the farmers, both semi-organic and conventional farmers, in each village. Finally, the systematic random sampling was applied to determine the respondents. In each village, as many as 30 semi-organic and 30 conventional farmers were selected as respondents. Therefore, the total respondent is 600 farmers, consisting of 300 semi-organic and 300 conventional farmers.

Data Analysis

Data were analyzed descriptively using mean in terms of perceived usefulness, environmental concern, perceived risk, attitude, and behavioral intention. To measure the extent of perceived and attitude level, the Likert scale with a range of 1 (strongly disagree) to 7 (strongly agree) was applied. Higher mean score indicates higher perception of the variable in question. All these variables in this study are unobserved/ latent/constructs; hence, each construct is described by some measurement variables. Meanwhile, inferential statistical test was performed to examine the relationship between perception and attitude (as independent variables) to behavioral intention (dependent) using multiple linear regressions with ordinary least squares (OLS).

Model specification was formulated in the multiple linear regressions and written as follows:

$$BI = \beta_0 + \beta_1 PU + \beta_2 EN + \beta_3 AT + \beta_4 PR + \mu$$

where:

BI = behavioral intention
PU = perceived usefulness
EC = environmental concern
AT = attitude
PR = perceived risk
μt = error term,

Based on the model specification, the sign of coefficient in each independent variable will hopefully estimated to be β1 > 0, β2 > 0, β3 > 0, or β4 < 0. This means that the perceived usefulness, environmental concern, and attitude are expected to positively affect behavioral intention. Conversely, the perceived of risk will negatively influence behavioral intention.

In addition, firstly the independent t-test would be conducted before executing the regression analysis. Such test is required to examine what the mean of all constructs (PU, AT, EN, PR, IN) are different between semi-organic and conventional farmers. If the independent test's result was significance, it indicated that the two groups are independently distributes and enable to propose two models separately. Otherwise, it means that the two types of farmers are similar and we simply have one model or the data should be merged. Subsequently, the factor analysis is executed to determine the measurement variables which have a significant contribution to construct. The selected measurement variables, then is calculated to obtain the mean of each construct for running regression process.

Significance Test

To examine the goodness of model, the significance test will be employed. There are two types of such significance test, namely F-test and t-test. The F-test is used to determine whether a significant relationship exists between the dependent variable and the set of all the independent variables. The F-test is referred to as the test for overall significance. The hypotheses will be tested is

H_0: $b_1 = b_2 = \ldots = b_p = 0$

H_a = One or more of the parameters is not equal to zero

In association with F-test, the rule will reject H_0 if p-value < a or if $F > F_a$, where F_a is based on an F distribution with p degrees of freedom in the numerator and $n - p - 1$ degrees of freedom in the denominator. If the test results reject H_0, it means that at least one or all of independent variables affect the dependent variable or statistically significant. In other words, the model is "good" or fit to predict the influence of the independent variables towards the dependent variable. Conversely, if the test results accept

H_0, it implies that there is no independent variable that affects behavioral intention. Thus, the model is inappropriate to predict the influence of independent variables on dependent variable (Gujarati 2002).

Meanwhile, the *t*-test is used to determine whether each of the independent variables is significant, individually. A separate *t*-test is conducted for each of the independent variables in the model. The hypotheses of t-test are

Ho : βi =0

Ha : βi ≠ 0

The t-test rule states that H_0 is rejected if *p*-value ≤ a or if $t \leq -t_{a/2}$ or $t \geq t_{a/2}$ where $t_{a/2}$ is based on a *t* distribution with $n - p - 1$ degrees of freedom. If the test results reject H_0, it implies that the variables tested have significant effect on the dependent variable or statistically significant. In contrast, if the test results accept H_0, it means that independent variables do not affect the dependent variable (Gujarati 2002).

In addition, to investigate the multicollinearity problem could be done by looking at the value of variance inflation factor (VIF). In statistical term, the VIF quantifies the severity of multicollinearity in an OLS regression analysis. Juanda (2009) revealed that in the regression equation model, a VIF value less than 10 indicated there was no multicollinearity in the model.

RESULTS AND DISCUSSION

Farmer's Perception and Attitudes toward Organic Farming

Perceived Usefulness

Since perceived of usefulness (PU) is a latent variable, there are 9 measurement variables to represent the PU in both semi-organic and conventional farmers. The farmer's perception toward the usefulness of organic farming (PU) is exhibited in Table 1. The table shows that the highest score for semi-organic farmer is attained by point 1 (PU1) namely organic farming will improve soil fertility, then followed by PU4 = easier for preparation of land (tillage) and PU9 = generally will be advantageous.

This result is consonant with the study of Sukristiyonubuwo et al. (2011) that revealed the farmer's perception toward the reason to convert paddy farming systems from conventional into organic is primarily to improve land fertility and facilitate the land preparation. The farmers believe that in the long term, this practice will generate an advantage for farmers.

Attitude toward Organic Farming Practices

The attitude of farmers toward organic farming practice is presented in Table 2. There are five measurement variables, that show in

Table 1. Perceived usefulness toward organic farming among semi and conventional farmers in Sragen Regency, 2015

Code	Measurement	Semi		Conventional	
		Mean	SD	Mean	SD
PU1	Practicing organic farming would improve land fertility	6.310	0.537	5.963	0.700
PU2	Practicing organic farming would increase the productivity	5.910	0.630	5.337	1.138
PU3	Practicing organic farming would enhance the effectiveness on paddy cultivation so reducing cost production	5.947	0.642	5.370	1.232
PU4	Practicing organic farming would make easier in preparation of land (tillage)	6.300	0.569	5.903	0.660
PU5	Practicing organic farming would be useful in terms of increasing income	5.940	0.614	5.250	1.197
PU6	Practicing organic farming gives me greater control over my work in paddy field	5.693	0.703	5.090	1.273
PU7	The price of selling organic rice is very good for me to start practicing organic farming	5.947	0.852	5.130	1.421
PU8	The advantages of organic farming will outweigh the disadvantages	5.717	0.691	5.053	1.320
PU9	Over all, practicing organic farming will be advantageous	6.047	0.582	5.307	1.251
	Mean	5.979		5.378	

Source: Primary data (2015)

general the attitude score in both farmer's type toward organic farming is enough high. Further, there is a similarity between semi- and conventional farmers in terms of rank of attitude. Farmers place AT1 (practicing organic farming is a good idea) as the first rank followed by PU2 (organic farming practice as a wise idea). They also deem that the organic farming will bring profit to them as the third order. The mean of total measurement score indicates that the score of semi-organic farmers is still higher than conventional farmers, i.e. 6.000667 vs 5.452.

Environmental Concern

In terms of organic farming the aspect of environmental awareness is the central issue. The more awareness the higher appreciation toward organic farming practices. Table 3 shows that out of five measurement variables, the highest rank for semi-organic is EN3 and then followed by EN5 and EN4. The semi-organic farmers place organic farming benefits everyone, support environmental conservation and protect natural predator as the three best reasons. Meanwhile, the conventional farmers propose protect natural predator (EN4), secure their livelihood (EN1), and benefits everyone (EN3), respectively, in term their environmental concern expression. There is similarity in EN 3 and EN4 but conventional farmer has own opinion that practicing organic farming will secure their livelihood as farmer (EN1) as a key factor.

Perceived Risk toward Organic Farming Practice

The farmers' perceptions related to the risks that could be emerged if they practice organic farming presented in Table 4. Out of 7 items, It is indicated that the semi-organic farmers are most concerned about the risk for PR1 which will reduce revenue, followed by PR3 (the risk of production) and then the PR4 (marketing risks). Meanwhile, for conventional farmers the highest score is points PR2 that is uncomfortable (anxiety), followed by PR1 (the possibility of reduced income) and PR3 (production risk). Table 4 also indicates the differences in the pattern of perception compared to the previous construct. In terms of perceived risk, all measurement variables demonstrate that the scores of conventional farmer are always greater than those of the semi-organic farmers. The

Table 2. The attitude toward organic farming among semi and conventional farmers in Sragen Regency, 2015

Code	Measurement	Semi		Conventional	
		Mean	SD	Mean	SD
AT1	Practicing organic farming is a good idea	6.143	0.501	5.757	0.799
AT2	Practicing organic farming is a wise idea	6.110	0.588	5.620	0.927
AT3	Practicing organic farming is a pleasant idea	5.843	0.717	5.293	1.213
AT4	I like the idea of practicing organic farming	5.930	0.648	5.253	1.255
AT5	Practicing organic farming will bring profit for me	5.977	0.646	5.336	1.330
	Mean	6.001		5.452	

Source: Primary data (2015)

Table 3. Environmental concern toward organic farming among semi and conventional farmers in Sragen Regency, 2015

Code	Measurement	Semi		Conventional	
		Mean	SD	Mean	SD
EN1	Protecting the environment by practicing organic farming will secure my livelihood as farmer	5.940	0.625	5.557	0.877
EN2	Pollution generated by conventional farming harm people.	5.907	0.899	5.367	1.097
EN3	Environmental concern by practicing organic farming benefits everyone.	6.137	0.565	5.503	1.117
EN4	Environmental concern by practicing organic farming beneficial to protect natural predator	6.043	0.608	5.573	0.942
EN5	Practicing organic farming will support environmental conservation task	6.050	0.602	5.437	1.090
	Mean	6.015		5.487	

Source: Primary data (2015)

mean scores for all items also approve that perceived risk is higher for conventional farmers (2.5200 vs. 3.3200). The study of Prihtanti (2014) in Sragen and Karanganyar Regencies also revealed that the level of risk perceived by conventional farmers is greater than that perceived by farmers who have practiced organic farming system.

Behavioral intention to adopt organic farming

Ajzen (1991) argued that behavioral intention (BI) reflects how hard a person is willing to try, and how motivated he or she is, to perform the behavior. Table 5 shows the intention of both farmer types to adopt organic farming. For semi-organic farmers, it appears that the highest score is the point 1 (IN1) that they intend to practice organic farming in the future, followed by point 5 (IN5), namely intend to practice after being introduced. Meanwhile, the conventional farmers also showed similar behavior intention by choosing points 1 and 5 (IN1 and IN 5) as the first and second rank. In aggregate, the mean of behavioral intention to adopt of organic farming indicated that the score for semi-organic is higher than conventional farmers (5.8426 vs. 4.9227). It shows that the intention of semi-organic farmers is bigger to practice organic farming because they have had experience in practicing organic farming, although it was simply partial.

The Effect of Perception and Attitudes toward Behavioral Intention

Prior to execute the regression analysis for examining the impact of perception and attitude toward intention to adopt organic farming, it was required to undertake the independent sample test. Such analysis is needed to ensure that the

Table 4. Perceived of risk toward organic farming among semi and conventional farmers in Sragen Regency, 2015

Code	Measurement	Semi		Conventional	
		Mean	SD	Mean	SD
PR1	Practice of organic farming may cause my income decline.	2.627	1.136	3.360	1.578
PR2	There are difficulties to practice organic farming.	2.503	1.013	3.393	1.579
PR3	There is riskiness to do good organic farming.	2.613	1.092	3.343	1.413
PR4	I do not think it is good to practice the organic farming because of risk marketing concern.	2.580	1.023	3.333	1.504
PR5	It is riskier to practice the organic farming than conventional.	2.450	0.869	3.323	1.444
PR6	The organic farming will fail to fulfill my satisfaction.	2.380	0.719	3.186	1.377
PR7	I think it is not safe to practice organic farming technology because it just experimental stage and has not been implemented yet massively by agricultural expert and other farmers	2.487	0.875	3.300	1.491
	Mean	2.520		3.320	

Source: Primary data (2015)

Table 5. Behavioral intention toward organic farming among semi and conventional farmers in Sragen Regency, 2015

Code	Measurement	Semi		Conventional	
		Mean	SD	Mean	SD
IN1	I intend to practice organic farming in future	5.940	0.609	5.343	1.121
IN2	In choose farming method to increase income, organic farming is my priority	5.823	0.565	4.803	1.295
IN3	I would like recommend the organic farming to my relatives and friend	5.826	0.646	4.743	1.491
IN4	I'll intend to practice organic farming as soon as possible	5.750	0.797	4.747	1.369
IN5	I'll practice organic farming soon after it is introduced.	5.873	0.803	4.976	1.309
	Mean	5.843		4.922	

Source: Primary data (2015)

data of the two types of farmer is different. The result of independent sample test for the entire construct of semi-organic and conventional farmers shows that the two types of farmer is significantly different. All the constructs (PU, AT, PR, EC, IN) is significantly different at level 0.001 (Table 6). Hence, it enables to impose two types of farmers with their own model. In other words, there are two separate models in regression analysis for semi-organic and conventional farmers.

The factor analysis was undertaken for the entire construct. For semi-organic farmer, all constructs showed that the eigenvalues are larger than 1, which are IN (3.149) with factor loadings in the range of 0.632-0.863, PR (2.780), PU (2.599), AT (2.506), and EN (2.343). The result for factor analysis also showed that Kaiser-Meyer-Olkin (KMO) score for all of construct is above 0.5 (Table 7). It seems that the requirement of goodness of data for semi-organic farmer are fulfilled. However, few of initial item (measurement variable) are excluded from the construct due to have low factor loading (<0.5). The internal reliability analysis of all of the constructs which is represented by Cronbach Alpha show that the values are above 0.7. It indicates that all of the construct have a good internal consistency.

Similarly, in case of conventional farmer show that all of the requirement (factor loading, KMO, Eigenvalue and Cronbach Alpha) also are fulfilled (Table 8). After factor analysis has been done, it is obtained some measurements variables as a member of constructs. A little bit different with semi-organic farmer, in case of conventional farmer all of initial measurement variables are selected. These selected measurement variables, then to be calculated to get the mean of each construct to and to be processed in regression analysis.

The result of data analysis presented in Table 9 and 10. Such tables indicate the effect of perception and attitude toward behavioral intention in semi-organic farmer and conventional farmer's cases respectively. Table 6 indicates that PU, EN and AT positively influence the behavioral intention for organic farming adoption. Meanwhile, PR negatively affects the intention to adopt organic farming. The coefficient regressions show that an increase in PU, EN, and AT by 1% will raise the intention to adopt organic farming by 0.254%, 0.306%, 0.454% respectively. On the contrary, an increase of PR by 1% will reduce the intention to adopt organic farming by 0.063%.

In the case of conventional farmers, there is similarity with semi-organic farmers (Table 10) for the positive influence of PU, EN, and AT on behavioral intention. Likewise, the PR negatively affects behavioral intention. However, there the magnitude of response is very different. The increase in PU, EN, and AT by 1% causes the intention to adopt organic farming increases by 0.319%, 0.231%, 0.326%, respectively. Meanwhile, the increase in PR by 1% will reduce behavioral intention by 0.186%.

Table 6. Independent sample test of construct between semi-organic and conventional farmers in Sragen Regency, 2015

Code	Construct	Semi-organic		Conventional		P-value
		Mean	SD	Mean	SD	
PU	Perceived usefulness	6.143	0.501	5.757	0.799	0.000
AT	Attitude	5.843	0.716	5.293	1.213	0.000
PR	Perceived risk	2.520	0.627	3.320	1.211	0.000
EN	Environmental concern	6.015	0.448	5.487	0.829	0.000
IN	Intention	5.843	0.543	4.923	1.125	0.000

Source: Primary data (2015), processed

Table 7. Goodness of data in case of semi-organic farmers in Sragen Regency, 2015

Constructs	Items	Factor loading	KMO	Eigen values	Cronbach's Alpha
PU	6	0.525-0.715	0.800	2.599	0.727
AT	5	0.626-0.755	0.760	2.506	0.750
PR	6	0.591-0.747	0.799	2. 780	0.754
EN	5	0.536-0.778	0.766	2.343	0.689
IN	5	0.632-0.863	0.850	3.149	0.851

Note: the initiated items for PU and PR were 9 and 7 respectively

Other studies, for instance Yi et al. (2006) and Elkaseh et al. (2016) also attested the positive and significant effect of perceived usefulness on the intention to accept certain technology and social networking media for e-learning. Similarly, the study of Fagan et al. (2008) and Suki & Suki (2011) revealed a positive and significant relationship between PU and adoption intention to use computers and 3G technology, respectively. Meanwhile, the study of attitude toward intention conducted by Sheeran and Taylor (1999) revealed that attitude-behavioral intention correlation was 0.45. In addition, Godin and Kok (1996) reported a mean attitude-intention correlation of 0.46. Hence, it is obviously that there is positive correlation between attitude and behavioral intention.

Table 9 shows that R^2 = 48.3% which indicates that 48.3% variation of the dependent variable (behavioral intention) of semi-organic farmer explained by the independent variable (PU, EN, AT, and PR). In other words, 51.7% intention to adopt organic farming is explained by other factors that are not included in the model. Meanwhile, Table 10 shows that R^2 = 59.6% that implies 59.6% variation of the dependent variable of conventional farmer explained by independent variables.

Further, regarding to the sign of coefficient value, it is obviously that all of the coefficient variables are appropriate with the proposed hypotheses. The simultaneous effect of independent variables toward dependent variable can be indicated by the F-statistic probability value. In case of semi-organic farmer, probabilistic of F-statistic obtained at 0.000 which is less than the significance level used at 1%. It means that at least one independent variable affects the dependent variable significantly. Meanwhile, for conventional farmers indicate the similar case related to F-statistic value.

Table 8. Goodness of data in case of conventional farmers in Sragen Regency, 2015

Constructs	Items	Factor loading	KMO	Eigen values	Cronbach's Alpha
PU	9	0.595-0.873	0.934	5.503	0.917
AT	5	0.792-0.902	0.838	3.705	0.907
PR	7	0.791-0.875	0.882	4.682	0.916
EN	5	0.695-0.878	0.839	3.277	0.864
IN	5	0.778-0.899	0.819	3.630	0.904

Table 9. Result of analysis the factors affecting behavioral intention of semi-organic farmers in Sragen Regency, 2015

Codes	Variables	Coefficient	t-statistic	Probability	VIF
C	Constant	0.232	-0.176	0.861	
PU	Perceived usefulness	0.179	2.888	0.004**	1.478
EN	Environmental concern	0.318	5.039	0.000**	1.546
AT	Attitude	0.470	6.964	0.000**	1.723
PR	Perceived risk	-0.069	-1.787	0.075	1.165
R^2= 48.20% Probability (F stat)= 0.000 F-stat = 68.555					

Table 10. Result of analysis the factors affecting behavioral intention of conventional farmers in Sragen Regency, 2015

Codes	Variables	Coefficient	t-statistic	Probability	VIF
C	Constant	0.778	1.764	0.790	
PU	Perceived usefulness	0.319	3.450	0.001**	4.002
EN	Environmental concern	0.231	3.077	0.002**	2.225
AT	Attitude	0.326	3.728	0.000**	4.007
PR	Perceived risk	-0.186	3.077	0.000**	1.542
R^2= 59.6% Probability (F-stat)= 0.000 F-stat = 108.703					

To determine whether the independence variables individually have significant effect toward the dependent variable can be detected by the t-statistic. Table 9 demonstrates that the factors which affect the intention to adopt organic farming are PU, EN, and AT with the probability t-statistic values of 0.001, 0.000, and 0.000, respectively. These variables significantly affect intention at α level of 1%. Meanwhile, the PR variable has a t-statistic value of 0.104 or does not significantly affect intention at α level of 5%. In the case of conventional farmers, it indicate all independent variables individually affects the intention at α level of 1%

Based on statistical analysis (Table 9 and 10); therefore, the equation model of factors affecting the intention to adopt organic farming in research location could be written as follows:

$$BI_{semi} = 0.232 + 0.179\ PU + 0.318\ EN + 0.470\ AT - 0.069\ PR + \mu$$

$$BI_{conv} = 0.778 + 0.319\ PU + 0.231\ EN + 0.326\ AT - 0.186\ PR + \mu$$

The estimated regressions show that although the intercept is different in terms of magnitude; however, in general the signs of the estimated coefficients are in the same direction. The positive effects are exhibited by PU, EN, and AT, whereas PR is negative. All variables are consistent with hypothetical expectation.

A problem that is frequently emerged in the OLS is multicollinearity and as aforementioned, the existence of multicollinearity problem in the model could be detected by variance inflation factor (VIF) value. The rule of thumb states that if VIF value is less than 10, it indicates that there is no multicollinearity. The results of data analysis in both semi-organic and conventional farmers indicate that the VIF values of all independent variables are below 5. In other words, it is obvious that there is no multicollinearity in the model.

In general, the results (Table 9 and 10) exhibit that the models used in this study are good enough. It could be indicated by statistic criteria testing and econometric parameters. The statistical criteria are demonstrated by the value of R-squared, F-statistic, and t-statistics. Meanwhile, one of the econometric criteria can be examined by looking at the results of multicollinearity test. However, based on statistical criteria it is likely that the conventional farmer model is slightly better than semi-organic farmer model.

CONCLUSION AND RECOMMENDATION

Conclusion

The results of analysis show that the perception of the usefulness, environmental concern, and attitude toward organic farming has a positive and significant effect on the intention to adopt organic farming of both semi-organic and conventional farmers. The positive effect of the three variables (constructs) against the intention of adoption demonstrates these constructs play significant role in decision process to adopt or reject the organic farming practice.

The perceived risk has a negative and significant effect on conventional farmer's intention to adopt organic farming; however, it does not significantly affect semi-organic farmer's. It seems that the conventional farmers are risk sensitive and regard that organic farming is a risky business. The crucial point to be taken account is that the lower the perceived risk the higher is the chance of farmers to adopt organic farming.

Recommendation

The positive and significant of perceived usefulness, environment concern, and attitude imply that to encourage adoption of organic rice farming, the efforts should be emphasized on such aspects. The significance role of usefulness suggests the government should be able to convince the farmers that organic farming can provide various benefits or advantages for them. Meanwhile, the significant roles of environmental concerns and attitudes imply the need of program to raise the awareness of sustainability agricultural development. It requires a better support from government, i.e. education and training for farmers in order to be more skilled and also shaping a good attitude toward organic farming practice. The "Go Green" campaign could be as priority to disseminate among the paddy farmers.

In addition, in association with the negative effect of perceived risk on intention to adopt organic rice farming, the government should facilitate the programs that can minimize the risk both in production and the price aspect. The endeavors could be undertaken through education or extension of good agricultural practice (GAP) and provide the assistance in creating the market opportunities to acquire viable price. The conventional farmer should be

paid more attention in term risk mitigation to encourage them for engaging in organic rice farming.

ACKNOWLEDGEMENT

We gratefully acknowledge the full support of the Sustainable Management of Agricultural Research and Technology Dissemination (SMARTD) Project-IAARD and all of enumerators as well as the Agricultural Extension Office staff of Sragen Regency for their help in data collection process. We also thank for the reviewers who provide insight for improving this paper.

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