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FACTORS INFLUENCING THE APLICATION OF ORGANIC VEGETABLE FARMING IN SAMARINDA CITY (CASE STUDY AT NORTH SAMARINDA SUBDISTRICT, EAST KALIMANTAN)

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ABSTRACT: *The objectives of research are to understand the application rate of organic vegetable farming and to analyze factors influencing the application of organic vegetable farming in Samarinda City. Research is carried out in North Samarinda Subdistrict, Samarinda City, from April to June of 2013. Method of research is survey and the sampling technique is simple random sampling. Result of research has shown that (1) the application of organic vegetable farming in Samarinda City is classified into four categories, which include conventional category for very low application rate, knowing-organic category for low application rate, interest-in-organic category for moderate application rate, and toward-organic category for high application rate; (2) some factors such as age, land width, number of training, farmers' general knowledge about organic, farmers' knowledge about the principle and benefit of application, and farmers' knowledge about organic agriculture technique, will give significant influence on the application of organic vegetable farming; and (3) the application rate of organic farming has significant influence on the production and income of vegetable farmers. Farmers with toward-organic application rate of vegetable farming have higher production and income than those with conventional, knowing-organic and interest-in-organic farming.*

KEYWORDS: vegetable, application, organic, income

INTRODUCTION

The increasing number of population has a reasonable consequence, which is the increasing consumption rate among the population, including in Samarinda City. It is a city which has applied the development policy strategy which is focused on the urban development. The land use pattern is designed to follow the distribution pattern of the population. Therefore, for agriculture development, the Government of Samarinda City applies the optimization strategy for agriculture resources through intensifying agriculture resources but relying on the application of agrochemical materials. The excessive use of agrochemical input may not only decrease soil fertility but also ironically increase the resistance of pest and disease against preventive measure. It is not surprising if farmers need higher dose to increase their agriculture production. Therefore, sustainable agriculture attempts to implement intensive agriculture by considering the aspects of conservation, land and environment supporting capacity, and local knowledge as the important factors for efficiency calculation (Untung, 1997).

Sustainable agriculture has some attributes to consider such as the use of resource, quality and quantity of production, and environment (Untung, 1997). Renewable and unrenewable resources are utilized in the agriculture production process with as minimal as possible negative impact on environment. Therefore, sustainable agriculture system must be evaluated with criteria such as safe based on environment perspective, profitable based on economic perspective, equitable based on social perspective, and humane based on its usefulness to all living beings and its easiness of adaptability (Reijntjes, et al, 2006). Sustainable agriculture production process may be directed toward the biology product which is environmental friendly (Untung, 1997).

Organic farming represents an application of sustainable agriculture which emphasizes on natural dry matter recycle. The use of input from outside agriculture is therefore lower (Mutiarawati, 2006). Also, organic farming can provide the base for agriculture result production, animal breeding, and natural ecology balance (Rosenow, et al, 1996). The growth of consumer awareness about food security issue and environmental issue may increase the community demand for organic product and develop the interest into organic farming in worldwide (Tzouramani, et al, 2008). Indeed, organic farming certainly uses non-synthetic product for production such that it is friendly for the environment, it warrants the preservation of environment and it will officer healthy food free from chemicals which are usually used in the commercial food production (Suranto, 2002; Giovanucci, 2007; Wright, et al, 2012). Key factors empowering organic sector development are strong demand of consumer combined with the well-organized organic production chain (Tzouramani, et al, 2008). Therefore, the objectives of research are to understand the application rate of organic vegetable farming and to analyze factors influencing the application of organic vegetable farming in Samarinda City.

METHODS

Research location is decided "*purposively*" by consideration that the location of research is a center of agriculture in Samarinda City. Research length for primary data collection is 3 months, counted from April 2013 to June 2013.

The allocation of sample in this research is using *simple random sampling* as sampling technique with the following equation:

$$n = \frac{N}{N.d^2 + 1} = \frac{171}{171 \text{ x } 0.1^2 + 1} = 63$$

where:

n = the number of total sample

N = the number of total population

d = the determined precision for 10 %

Data are acquired directly by observation and by taking the data from research object. Organic application rate is understood by giving questions to be answered by respondents. Different score is provided for each answer. Highest score is five and lowest score is one. Score from each respondent is summed to determine the category.

Pursuant to Suparman (1990), class interval is determined as following:

$$C = \frac{Xn - Xi}{K}$$

where:

C = Class Interval

K = Number of Class

Xn = Maximum Score

Xi = Minimum Score

Result of this calculation is used to determine the category of organic application rate as shown in the Table 1.

Table 1: The Measuring Scale of Organic Agriculture Application Rate

Items	Scoring				
	(1)	(2)	(3)	(4)	(5)
1. Organic Seeds	Never	Once	Sometimes	Often	Always
2. Conversion of Organic Land	Never	Once	Sometimes	Often	Always
3. The Use of Water Source	Never	Once	Sometimes	Often	Always
4. Maintenance of Soil Fertility	Never	Once	Sometimes	Often	Always
5. Control over Pest, Disease and Weed	Never	Once	Sometimes	Often	Always
6. Treatment of Harvest and Post-Harvest	Never	Once	Sometimes	Often	Always
Total	20-35	36-51	52-67	68-83	84-100
Application Rate	Very low	Low	Moderate	High	Very High
Application Category	Convent	TOR	MINOR	MAJOR	ORGANIC

The factors influencing organic agriculture application rate is tested with multiple regression analysis. This analysis is conducted against organic the function of agriculture application using SPSS Version 18.0. The model of the function of organic agriculture application is:

$$Y_{adoption} = \alpha 0 + \alpha 1X1 + \alpha 2X2 + \alpha 3X3 + \alpha 4X4 + \alpha 5X5 + \alpha 6X6 + \alpha 7X7 + \alpha 8X8$$

Where:

Y = the adoption or the application of organic agriculture

X1 = the age of farmers (years old)

X2 = land width (ha)

X3 = the last education background

X4 = number of information source
X5 = number of training
X6 = knowledge about organic agriculture
X7 = knowledge about the importance of organic agriculture
X8 = knowledge about the method of organic agriculture
α0 = intercept / constant
α1,…, α8 = coefficient of regression
μ = error term

RESULTS AND DISCUSSION

The identification of farming application in Samarinda City has found five (5) application rates which are then converted into five (5) categories of organic application. These categories are conventional category for very low application rate, knowing-organic category for low application rate, interest-in-organic category for moderate application rate, and toward-organic category for high application rate. The percentage of any application rates by farmers is shown in the following Tables.

Table 2 displays the application of seed source indicator in the organic vegetable farming. There are 25.39 % respondent farmers with very low application rate, 11.11 % farmers with low application rate, 30.15 % with moderate application rate, 33.33 % with high application rate and no farmers with very high application rate.

If seed source indicator in the application of organic vegetable farming is strictly examined, it is indeed no respondent farmers included within very high application category, but farmers are evenly distributed among all application categories. If any respondent farmers belong to very high application category, it is because farmers are not incidentally implementing seed treatment for the application of organic vegetable farming. High cost for seed deployment has forced farmers to self-dependent in preparing seed for many vegetable varieties.

Table 2: Seed Source Indicator of Organic Vegetable Farming

Application Type	Frequency (%)				
	Never (1)	Once (2)	Sometimes (3)	Often (4)	Always (5)
1. The Use of Seeds from Local Leading Variety.	20.63	4.76	9.52	33.33	31.75
2. The Use of Seeds from Leading Variety Based on Organic Cross.	34.92	30.15	34.92	0	0
Average Frequency	27.78	17.46	22.22	16.67	15.87
Score total	2-3.5	3.6-5.1	5.2-6.7	6.8-8.3	8.4-10
Frequency	25.39	11.11	30.15	33.33	0
Application Rate	Very low	Low	Moderate	High	Very High

Source : Result of Primary Data Processing

Table 3 shows the application of organic vegetable farming based on the indicator of farming land conversion. Most respondent farmers are never in purpose converting the land into organic vegetable farming. It is because of lack of resource including land supply and time to cultivate. Farmers are still focused on cultivating their previous land because the land is the main supporter to the daily subsistence of farmers and their family.

Local Agriculture Official has actually provided a plot of land to be used by farmers to apply the organic vegetable farming. Due to constraints above, this plan is not yet implemented. Few respondent farmers are indeed converting their land but not for the application of organic vegetable farming. The conversion is made only for the expansion of land or for seeking for a more fertile land.

A solution offered to these farmers is to persuade farmers to set aside few portions of their land to be used as demonstration plot for organic vegetable farming. Therefore, farmers can still do their conventional farming for daily subsistence but also apply organic farming despite its smaller scale.

Table 3: Land Conversion Indicator of Organic Vegetable Farming

Application Type	Frequency (%)				
	Never (1)	Once (2)	Sometimes (3)	Often (4)	Always (5)
1. The conversion of ex-conventional agriculture land, using organic fertilizer and eliminating synthetic chemical fertilizer for ≥ 2 years.	50.79	28.57	20.53	0	0
Score total	1-1.7	1.8-2.5	2.6-3.3	3.4-4.1	4.2-5
Frequency	50.79	28.57	20.63	0	0
Application Rate	Very low	Low	Moderate	High	Very High

Source : Result of Primary Data Processing

Table 4 indicates the application of organic vegetable farming based on water source indicator for organic farming. Most respondent farmers have implemented the indicator of water source organic vegetable farming either on-purpose or not. It is because at research location, there are water sources that must be useful for the irrigation of farming, either by individual or collective manners. Farmers with farming area that is distant from water source only rely on rainfall either by accumulating the rain into the pool or other method. Farmers who depend on river stream will channel the stream through ditches into their farming area or settlement area. However, such habits are putting difficulties to the application of organic farming which requires that organic crop shall not be contaminated with inorganic materials.

Table 4: Water Source Indicator of Organic Vegetable Farming

Application Type	Frequency (%)				
	Never (1)	Once (2)	Sometimes (3)	Often (4)	Always (5)
1. The use of water source which is not passing conventional agriculture area.	23.80	1.58	15.8	80.95	47.61
2. The use of water source from the rainfall pool which is believed not contaminated by inorganic material.	12.69	9.52	25.39	6.34	46.03
Average Frequency (%)	18.25	5.55	20.63	8.73	46.82
Score total	2-3.5	3.6-5.1	5.2-6.7	6.8-8.3	8.4-10
Frequency	11.11	15.87	22.22	6.34	44.44
Application Rate	Very low	Low	Moderate	High	Very High

Source : Result of Primary Data Processing

Table 5 exhibits the application of organic vegetable farming based on the indicator of soil fertility maintenance in organic way. For this indicator, most farmers are not yet applying organic farming. It is because farmers are highly depending on inorganic fertilizers and still assume that their farming will produce great harvest if they use greater dose of fertilizer.

The use of organic fertilizer to replace inorganic fertilizer is a requirement for organic vegetable farming. However, inorganic fertilizer is not abandoned at all in the vegetable farming at research location. Indeed, inorganic fertilizer seems more practical and easy to use although it is more expensive and rarely found in market.

Table 5: Soil Fertility Maintenance Indicator of Organic Vegetable Farming

Application Type	Frequency (%)				
	Never (1)	Once (2)	Sometimes (3)	Often (4)	Always (5)
1. The planting of *leguminous*, the use of green fertilizer or crop rotation.	22.22	23.80	14.28	25.39	14.28
2. The use of vegetation-based compost.	17.46	7.93	12.69	31.74	30.15
3. The use of dung-based compost.	9.52	3.17	20.63	14.28	52.38
4. The use of natural herb drugs.	49.2	23.80	12.69	1.58	12.69
5. The elimination of	22.22	26.98	44.44	6.34	0

synthetic chemical fertilizer.					
Average Frequency (%)	24.12	17.14	20.95	15.87	21.90
Score total	5-8	9-12	13-16	17-20	21-25
Frequency	28.57	20.63	38.09	12.69	0
Application Rate	Very low	Low	Moderate	High	Very High

Source : Result of Primary Data Processing

The application of organic vegetable farming based on the indicator of the control over pest, disease and weed is displayed in Table 6. The number of respondent farmers with very low application category is the highest with 44.44 %. It is because the use of chemical material including pesticide is greatly relied on by farmers to control over pest, disease and weed. However, chemical material is always avoided in the application of organic farming.

Table 6: The Application of Indicator of Control over Pest, Disease and Weed of Organic Vegetable Farming

Application Type	Frequency (%)				
	Never (1)	Once (2)	Sometimes (3)	Often (4)	Always (5)
1. The elimination of chemical pesticide.	47.61	7.93	44.44	0	0
2. The selection of appropriate variety.	50.79	22.22	22.22	22.22	4.76
3. The implementation of crop rotation.	22.22	23.80	14.28	25.39	14.28
4. The implementation of mechanical soil cultivation.	15.87	14.28	36.50	31.74	1.58
5. The use of natural herb drugs.	49.20	23.80	12.69	1.58	12.69
6. The introduction of natural enemy including predator and parasite.	38.09	47.61	14.28	0	0
7. Mechanical control.	44.44	28.57	20.63	6.34	0
8. The elimination of synthetic ZPT and also genetically engineered organism or product.	58.73	25.39	11.11	4.76	0
Average Frequency (%)	40.87	24.20	22.02	9.32	3.57
Score total	8-13	14-19	20-25	26-83	32-40
Frequency	44.44	23.80	19.04	11.11	1.58
Application Rate	Very low	Low	Moderate	High	Very High

Source : Result of Primary Data Processing

Very high application category is only 1.58 %. This percentage is obtained from the selection of variety, crop rotation, mechanical soil cultivation, and herbal drugs. It is expected that such efforts will shift from only to implement merely or accidentally, toward the willingness to apply organic vegetable farming.

The application of organic farming based on indicator of harvest and post-harvest is shown in Table 7. There are 95.23 % respondent farmers belonged into very low application category. It is because farmers do not know how to apply organic vegetable farming. Although some indicators of organic farming are implemented, but all are still beyond organic vegetable farming category, and therefore, harvest is still packaged conventionally.

Table 7 indicates that no respondent farmers have applied pure organic vegetable farming. It is because farmers only know and agree with organic farming, but they do not know detail about organic farming technique. The absence of market for organic farming harvest is also a reason why farmers hesitate to apply pure organic farming. Lack of resource also forces farmers to sell vegetables to conventional market.

Table 7: The Indicator of Harvest and Post-Harvest of Organic Vegetable Farming

Variables and Indicators	Frequency (%)				
	Never (1)	Once (2)	Sometimes (3)	Often (4)	Always (5)
1. The accumulation of harvest in the specific area to avoid from blending with conventional yield, and then given label.	95.23	3.17	1.58	0	0
2. The transport of harvest within specific batch and with specific transportation to warrant for cleanliness.	95.23	3.17	1.58	0	0
Average Frequency (%)	95.23	3.17	1.58	0	0
Score total	2-3.5	3.6-5.1	5.2-6.7	6.8-8.3	8.4-10
Frequency	95.23	3.17	1.58	0	0
Application Rate	Very low	Low	Moderate	High	Very High

Source : Result of Primary Data Processing

Organic agriculture is an adaptation involving trial-error by organic farmers and consumers (Kummer et al, 2010). Therefore, final decision by farmers to use new practice, such as organic agriculture system, is usually a product of their knowledge and perception about organic farming practice (Assis and Ismail, 2011).

Respondent farmers do analysis based on the information they have got from their experience which confirms that the application of organic farming can indeed reduce

their dependence on chemical material. Farmers also realize that the use of chemical material in the land cultivation is harmful because land may loss the fertility such that higher dose of fertilizer is needed but impacting on high expense for purchasing fertilizer.

Organic agriculture indeed maintains the quality of soil and the better local ecosystem which may lead to the improvement of production and income of farmers.

Analysis of ratio of R/C to cost total in research location is:

R/C = 66,389,338,23 / 29,725,412.30

= 2.23

The average score of R/C to total cost is 2.23 meaning that every Rp. 1.00 spent will produce Rp 2.23 received as revenue. It is profitable.

Respondent farmers have understood that sale price of organic farming harvest is higher than that of conventional farming. It shall increase their income. However, market for organic farming harvest is still lacked and it has forced farmers to only agree with the concept of organic farming. Farmers begin to realize that their consumers in traditional market still prefer for conventional vegetable because it is cheaper than expensive organic vegetable. It can be said then that the understanding about the importance of organic application is not only needed for producer level, which is farmers, but also meaningful for the community as the consumer. It shall be an opportunity for the government and other stakeholder to act as the bridge for farmers as the producer and the community as the consumer.

Factors Influencing The Application of Organic Agriculture

Multiple Regression Analysis is used to understand factors influencing vegetable farmers in applying organic agriculture. The application of organic agriculture at vegetable farming is influenced by some factors such as age, formal education, land width, number of information source, number of training, knowledge about agriculture and environment, knowledge about the importance of organic agriculture, and knowledge about the method of organic agriculture.

Result of multiple regression analysis, supported with SPSS Version 18.00 is shown in Enclosure 1. Result of ANOVA against the factors influencing the application of organic agriculture in the vegetable farming in North Samarinda Subdistrict is explained as following.

Table 8: Result ANOVA against The Factors Influencing The Application of Organic Agriculture In The Vegetable Farming

Source of Variance	db	Number of Square	Middle Square	F-count	Pr > F
Regression	8	8972.526	1121.566	7.278	0.000
Residual	54	8322.078	154.113		
Total	62	17294.603			

Source: Result of SPSS Analysis, 2018

Table 8 has indicated F_{count} = 7.278 at probability 0.000 < 0.010 (α = 1%) which proves that zero hypothesis is rejected. It means that independent variables such as farmers' age, formal education, land width, number of information source, number of training, knowledge about agriculture and environment, knowledge about the importance of organic agriculture, and knowledge about organic agriculture technique, are simultaneously influencing the application of organic agriculture in vegetable farming. The influence of each independent variable on dependent variable is processed in t-test as shown in Table 9.

Table 9: Result of Estimation of Parameters in Equation of Organic Agriculture Application in Vegetable Farming

Variables	Coefficient	Standard Error	t-count	Pr > |t|	Elasti-city
Intercept	22.193				
Age (X1)	-.285	0.187	-1.523	.134	-0.30
Education (X2)	1.850	1.641	1.127	.265	0.10
Land Width (X3)	.005	0.002	2.345	.023	0.05
Number of Information Source (X4)	1.114	1.752	0.636	.528	0.05
Number of Training (X5)	2.504	0.942	2.658	.010	0.08
Knowledge about Agriculture and Environment (X6)	1.634	0.513	3.184	.002	1.30
Knowledge about The Importance of Organic Agriculture (X7)	.671	0.263	2.553	.014	0.51
Knowledge about Organic Agriculture Technique (X8)	.805	0.174	4.624	.000	0.58
Koefisien determinan (R^2) yang disesuaikan	0.4480				

Source: Result of SPSS Analysis, 2013.

Coefficient of determinant (R^2) adjusted is 0.4480 which means that the variation in the application of organic agriculture in the vegetable farming can be explained by independent variables of farmers' age, formal education, land width, number of information source, number of training, knowledge about agriculture and environment, knowledge about the importance of organic agriculture, and knowledge about organic agriculture technique for 44.80 %, while the remaining 55.20 % are explained by other factor out of model.

The influence of each factor on the application of organic agriculture in the vegetable farming is elaborated as following. Age has negative obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda Subdistrict, where t_{count} = -1.523 at probability of 0.134 < 0.15 (α = 15 %) after two-direction test. Elasticity of -0.30 means that every 1 % increase of farmers' age can reduce the application of organic agriculture in the vegetable farming for 0.30% by assuming that other factors are constant. It is because farmers with higher age are complacent with what they have done in farming. Although farmers agree with organic farming concept, they hesitate to adapt with technology and innovation in their farming. This finding is relevant to Effendy et al (2013) who report that age is negatively correlated with the adoption of side-joint technology in cacao in Sigi District-Indonesia. It means that younger producers have negative influence on the use of information, agriculture technology and communication. Similar observation is given by Paxton et al (2011) and Moga et al (2012) that age has negative influence on the use of information, agriculture technology and communication. In contrast, Xu and Wang (2012), Lestrelin et al (2011) and Singha (2012) conclude that the application of technology is not determined by farmers' age.

Education has positive but not obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda District because t_{count} = 1.127 at probability of 0.265 > 0.15 (α = 15 %) after two-direction test. In average, the education of respondents is low such that it does not influence the application of organic agriculture. Education is not influencing significantly on the application of organic farming because the profession of farmer is considered second class occupation after other profession and therefore, being farmer is not attractive for people. If some people are indeed graduated from higher education and decide to be farmer, it is because their sociality is supporting, such as they come from farmer family or they marry with the descendant of farmer, especially farmer with good experience in the farming. However, education level can help improving the application of organic farming because the experience in education level can enhance the insight of farmers such that they open themselves to accept the innovation of organic vegetable farming and they can adapt to this innovation

quickly. It is aligned with Effendy et al (2013) who find that education has positive but not significant correlation with the adoption of side-joint technology side-joint technology in cacao plant in Sigi District, Indonesia. It is also supported by Raul (2011) and Lestrelin et al (2011) that education does not influence the decision of farmers to apply agriculture technology. Conversely, Singha (2012) and Abdullah and Samah (2013) indicate that education is positively and significantly correlated to the adoption of technology.

Land width has positive and obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda District because t_{count} = 2.345 at probability of 0.023 < 0.05 (α = 5 %) after two-direction test. Elasticity of 0.05 means that every increase of land width for 1% can increase the application of organic agriculture in the vegetable farming for 0.05% by assuming that other factors are constant. It is because if farmers have ability to cultivate wider land, there is possible for farmers to set aside some portions of their land for the application of organic vegetable farming without disturbing the main land for daily subsistence.

Number of information source has positive but not obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda District because t_{count} = 0.636 at probability of 0.528 < 0.15 (α = 15 %) after two-direction test. It is because in average, the education of respondents is low such that the number of information source does not influence the application of organic agriculture. Saedi et al (2011) have reported that age and access to information about agriculture and environment are two important variables with positive and direct impact on knowledge about organic farming. Other variable is social norms about organic agriculture through health attitude, nutrient attitude, and general attitude. Social norms can have direct but weak influence on knowledge about organic agriculture. Farmers with more accesses to the information about organic agriculture tend to have good perception than those with few accesses to the information about organic agriculture (Assis and Ismail, 2011).

Number of training has positive and obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda District because t_{count} = 2.658 at probability of 0.010 < 0.05 (α = 5%) after two-direction test. Elasticity of 0.08 means that every increase of number of training for 1 % can increase the application of organic agriculture in the vegetable farming for 0.08% by assuming that other factors are constant. It is because training gives important contribution to the adoption of technology for organic vegetable farming. With adequate frequency of training, farmers can have knowledge about organic farming and apply organic

farming into vegetable land. Therefore, training must not only be followed by certain member or group because if so, the transfer of information will not complete. All members or groups shall participate into direct training. If the fund is limited, the representatives of membership or group can be sent especially those who can do transferring the information about the application of organic farming. Indeed, the adoption of the application of organic farming will be evenly distributed in quick manner.

Knowledge about agriculture and environment has positive and obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda District because t_{count} = 3.184 at probability of 0.002 < 0.01 (α = 1 %) after two-direction test. Elasticity of 1.30 means that every increase of knowledge about agriculture and environment for 1 % can increase the application of organic agriculture in the vegetable farming for 1.30% by assuming that other factors are constant. It is because the information about agriculture and environment has been acknowledged by farmers and implemented by them although the form is different. For instance, in following the suggestion toward eliminating chemical material in the fertilization, farmers actually have been familiar with this suggestion because they often use dung to increase soil fertility. Farmers always utilize the feces and urines from the animal they breed.

Knowledge about the importance of organic agriculture has positive and obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda District because t_{count} = 2.553 at probability of 0.014 < 0.05 (α = 5 %) after two-direction test. Elasticity of 0.51 means that every increase of knowledge about importance of organic agriculture for 1 % can increase the application of organic agriculture in the vegetable farming for 0.51% by assuming that other factors are constant. It is because farmers have been familiar with information about the principle and benefit of organic farming although farmers do not observe it directly but only know it from printed and electronic media. For instance, the principle of health in organic agriculture may provide information about the benefit of organic agriculture for health. Farmers can estimate such information. Farmers' knowledge about the principle and benefit of organic agriculture can increase their adoption of the application of organic farming because such knowledge wakes them up to apply organic vegetable farming.

Knowledge about organic agriculture technique has positive and obvious influence on the application of organic agriculture in the vegetable farming in North Samarinda District because t_{count} = 4.624 at probability of 0.000 < 0.01 (α = 1 %) after two-direction test. Elasticity of 0.58 means that every increase of knowledge

about organic agriculture technique for 1 % can increase the application of organic agriculture in the vegetable farming for 0.58% by assuming that other factors are constant. It is because knowledge about technique of the application of organic vegetable farming is very important for farmers if they decide to adopt and to apply organic agriculture system in their land. Some organic agriculture techniques have been recognized by farmers. Some of these techniques are applied already by farmers such as using water source without contamination and using dung for fertilization. Water used by farmers is coming from water spring or rainfall pool. The use of dung involves using excretions from animal the farmers breed. Some techniques are not applied because of limited technology and resource, or urgent economic demand that needs to be met immediately. The use of the leading seed or the variant from leading seed, or the avoidance from using genetically engineered seed, are only applied by farmers to certain commodities such as sawi (green mustard) and katu (berry bush) because the seed is self-prepared. The use of pesticide and chemical fertilizer is still found because it concerns with economical issue, precisely that farmers still worry of loosing harvest from their vegetable farming. For packaging the vegetable harvest, farmers are not familiar with this process because they do not have package technology.

Farmers with high knowledge about organic agriculture tend to have good perception about organic agriculture compared to them with low knowledge about organic agriculture (Assis and Ismail, 2011). Therefore, knowledge of farmers about organic agriculture, mainly related to the use of chemical-based insecticide, herbicide, and fertilizer, needs for improvement. Their attitude toward organic agriculture is still negative. Farmers still depend highly on conventional practice (using chemical material) especially when they must control over pest and disease (Assis and Ismail, 2011; Oyesola and Obabire, 2011).

CONCLUSION AND SUGGESTION

Conclusion

1. The identification of the application of organic farming in Samarinda City is divided into four application rates, which are: conventional category for very low application rate, knowing-organic category for low application rate, interest-in-organic category for moderate application rate, and toward-organic category for high application rate.
2. Factors of age, formal education, land width, number of training, knowledge about general organic farming, knowledge about principle and benefit of application, and knowledge about organic agriculture technique, may have significant influence on the application of organic vegetable farming. Factors of education and number of information source do not have significant influence on organic vegetable farming in Samarinda City.

3. The application rate of organic agriculture has significant influence on the productivity and income of vegetable farmers. Farmers with toward-organic application rate in the vegetable farming have higher productivity and income than those with conventional, knowing-organic and interest-in-organic applications.

Suggestion

1. The application rate of organic vegetable farming in Samarinda City has not yet achieved the category of pure organic application but it has potential to reach this category. Therefore, such enthusiasm toward this category shall be maintained by developing knowledge about organic food either for farmers or community.
2. Specific organization must be established as the partner for farmers to accompany farmers' interest during the application of organic agriculture and also acted as the connecting bridge between farmers as producer and community as consumer.
3. Government shall play important role to encourage the application of organic vegetable farming in Samarinda City either by making policy related to this issue or by providing structure and infrastructure.

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