

Final Report to the Taiwan Fellowship Program 2019

Farmers attitude and readiness towards organic farming: cross comparison between Indonesia and Taiwan

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Sustainable development has caught the imagination and action all over the world for more than a decade. Sustainable agriculture is necessary to attain the goal of sustainable development. According to the Food and Agriculture Organization (FAO, 2000), sustainable agriculture" is the successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the quality of environment and conserving natural resources". All definitions of sustainable agriculture lay great emphasis on maintaining an agriculture growth rate, which can meet the demand for food of all living things without draining the basic resources (Alzaidi et. Al, 2013).

Sustainable agriculture has been the subject of growing interest due to the depletion and degradation of natural resources for realizing extensive farming. Traditional agriculture heavily relies on injudicious pumping of water resources, application of high rates of fertilizers and pesticides and other chemicals that pose adverse impacts on the ecosystem health and the human life (SPAR, 2012). Sustainable agriculture is based on the environmentally sound, appropriate, economically viable and socially acceptable farming principles and practices. Organic agriculture is one of the most important areas of sustainable agriculture (SPAR, 2012). According to Hartmann et al. (2012) Organic agriculture is a production management system that promotes the sustainability of agricultural ecosystems and ensures the production of safe healthy foods.

Organic farming is one of the several approaches found to meet the objectives of sustainable agriculture (Chang and Zepeda, 2005). Many techniques used in organic farming like inter-cropping, mulching and integration of crops and livestock are not alien to various agriculture systems including the traditional agriculture practiced in Asian countries like Indonesia and Taiwan. However, organic farming is based on various laws and certification programs, which prohibit the use of almost all synthetic inputs, and health of the soil is recognized as the central theme of the method (Kotile and Martin, 2000).

Organic farming is one of the widely used methods, which are thought of as the best alternative to avoid the ill effects of chemical farming. There are several definitions of organic farming and the one given by the US Department of Agriculture (USDA) is considered the most coherent and stringent. It is defined as 'a system that is designed and maintained to produce agricultural products by the use of methods and substances that maintain the integrity of organic agricultural products until they reach the consumer. This is accomplished by using substances, to fulfill any specific fluctuation within the system so as to maintain long term soil biological activity, ensure effective peak management, recycle wastes to return nutrients to the land, provide attentive care for farm animals and handle the agricultural products without the use of extraneous synthetic additives or processing in accordance with the act and the regulations in this part' (Patidar and Patidar, 2015).

Indonesia has a great potential to implement organic farming, but it should be implemented gradually. This is because of many comparative advantages, i.e. (i) there are large land areas available for organic farming; (ii) technology to support organic farming is available such as composting, no tillage planting, biological pesticides, among others. Although the government has launched various policies on organic agriculture such as "Go Organic 2010", but the development of organic farming in the country is relatively slow. This situation is due to various problems such as market constraints, consumers' interest, relatively expensive organic products certification for small farmers, and lack of farmers' attitude and readiness to implement organic farming. However, interest for organic farming has grown and it is expected to have positive impacts on the development of organic agriculture in Indonesia (Mayrowani, 2012).

In Taiwan, The Council of Agriculture (COA) plans to make a bigger push for the development of organic agriculture by promoting eco-friendly farming methods in light of the limited progress achieved in the government's drive for organic farming over the past decade. Although Taiwan has been promoting organic farming for about 10 years, progress has been limited as organic farms constitute only 0.7 percent of the nation's farmland, which is much lower than the more than the 10 percent share seen in several European Union member countries, according to the official from the COA's Agriculture and Food Agency. In addition, after the Agricultural Production and Certification Act was promulgated in 2007, there were 11 accreditation institutions that are competent to perform the certification process, as of the end of 2015 (Wang, 2015).

This research, however, is primarily concerned with organic farming are implemented in Indonesia and Taiwan which expects farmers to provide other societal benefits such as biodiversity, environmental protection and food safety. Such a model aims to satisfy consumers'

demand for 'healthier and more flavorsome food of higher nutritional value, produced by more environmentally friendly methods' (Brunori & Guarino, 2010). This research is based on the proposition that the attitudes and readiness of organic farmers may differ from those of farmers from Indonesia and Taiwan, especially in relation to farming, the environment and food security. A second proposition is that farming systems towards the organic end of the agricultural spectrum may appeal first and most strongly to farmers already attuned to environmental ideas. The research aims to compare the attitudes and readiness of those farmers in Indonesia and Taiwan, especially in relation to their attitudes and values towards farming, the environment and food security. More specifically, the research has the following research questions:

1. What is the readiness level as perceived by farmers in Indonesia and Taiwan towards organic farming implementation?
2. What is the readiness level as perceived by farmers in Indonesia and Taiwan towards organic farming implementation?
3. Do demographic variables (regency, gender, age, education, main job, job experience, land ownership) of farmers affect their perception of attitude and readiness towards organic farming implementation?

Research Methodology

This study carried out quantitative research to investigate perceptions of attitude and readiness towards organic farming implementation. The methodology used in this study was the survey method, whereby researchers distribute hardcopies of questionnaires to respondents. Respondents of this study were organic farmers from Surakarta, Indonesia and Taichung, Taiwan. About 120 organic farmers in Indonesia and 120 organic farmers in Taiwan were chosen through a purposive sampling. Descriptive statistics, validity and reliability analysis, One-way analysis of variance (ANOVA) and post hoc test Scheffe's Multiple Comparisons were applied to analyze the data using SPSS version 15. The questionnaire was developed through two steps. In the first step, the questionnaire was adopted from previous studies. The items of measurement for attitude were adapted from Al-Zaidi et al. (2013) and readiness was adapted from Purnomo and Lee (2010). A five-point Likert scale was used for 47- items with responses ranging from strongly disagree (1) to strongly agree (5).

RESULT AND DISCUSSION

Respondents' Demographic Variables

To provide a better insight into the participants, respondent demographic variables including regency, gender, age, education and job category were analyzed. Table 1 show that the Indonesia's respondent has gender composition consists of 98% male respondents. The age range of the respondents are in 30-40 years old (25%), 40-50 years old (44%) and 50-60 years old (30%). The highest level of education is that of a bachelor degree (3%), but mostly (71%) have education Junior high school. In terms of job category, a majority of the respondents (75%) are farmers, followed by those private employee (20%). Majority respondents have farming experiences 10-15 years (43%), followed by 5-10 years (23%). In term of surface land, mostly farmers only have < 2000 m² (64%), followed by 2000-5000 m² (32%).

Table 1: Respondents' demographical profile

INDONESIA				
No.	Aspect	Options	Frequency	Percent
1.	Gender	1. Male	98	82
		2. Female	22	18
2.	Age (years old)	1. < 30	11	9
		2. 30 – 40	25	21
		3. 40 – 50	44	36
		4. 50 – 60	36	30
		5. > 60	4	4
3.	Education	1. Elementary school	10	8
		2. J High school	85	71
		3. Senior high school	21	18
		4. Bachelor degree	4	3
4.	Main Job	1. Farmers	75	62
		2. Breeders	10	8
		3. Entrepreneur	5	4
		4. Civil servants	8	6
		5. Private employee	20	16
		6. Teachers	1	1
		7. Others	1	1
5.	Farming Experiences (Years)	1. 0-5	30	25
		2. 5-10	28	23
		3. 10-15	52	43
		4. > 15	10	9

6.	Land Area (m ²)	1. <2000	77	64
		2. 2000-5000	39	32
		3. 5000-10.000	4	4
TAIWAN				
1.	Gender	1. Male	90	75
		2. Female	30	25
2.	Age (years old)	1. < 30	14	12
		2. 30 – 40	40	34
		3. 40 – 50	30	25
		4. 50 - 60	25	20
		5. > 60	11	9
3.	Education	1. Not complete high school	10	8
		2. High school Complete	64	53
		3. University complete	38	32
		4. Graduate school complete	8	7
4.	Main Job	1. Farmers	84	70
		2. Breeders	9	8
		3. Entrepreneur	3	2
		4. Civil servants	8	7
		5. Private employee	10	8
		6. Teachers	3	2
		7. Others	3	2
5.	Farming Experiences	1. 0-5	15	12
		2. 5-10	37	30
		3. 10-15	42	36
		4. > 15	26	22
6.	Land Area (m ²)	4. <2000	72	60
		5. 2000-5000	46	38
		6. 5000-10.000	1	1
		7. > 10.000	1	1

According to Taiwan's respondent has gender composition consists of 90% male respondents. The age range of the respondents are in 30-40 years old (34%), 40-50 years old (25%) and 50-60 years old (20%). The highest level of education is Graduate school complete (7%), but mostly (53%) have high school education complete. In terms of job category, a majority of the respondents (70%) are farmers, followed by those private employee (8%) and breeders (8%). Majority respondents have farming experiences 10-15 years (36%), followed by 5-10 years (30%). In term of surface land, mostly farmers only have < 2000 m² (60%), followed by 2000-5000 m² (38%).

Measurement Validation

In this study, all measurement models were evaluated on multiple criteria such as uni-dimensionality, convergent validity and discriminant validity. An exploratory factor analysis (EFA) was conducted by principal component analysis (PCA) with varimax rotation. In order to decide which of the factors should be extracted and rotated, three methods were used: (1) a cut point of 0.4 and no significant cross loading criteria; (2) screen plot tests and (3) consideration of eigen value magnitude and discontinuity (Hair et al 1998). As shown in Table 2, EFA results from both attitude and perceived readiness suggest a clean two-factor solution (with item loading >0.7 and small cross loading). Cronbach's Alpha was employed to investigate the reliability of the factors.

Table 2: Result of Validity and Reliability Test

Constructs	Item	Mean	Standard Deviation	Factor Loading	Cronbach Alpha
Attitude	1	3.47	0.935	.689	0.846
	2	3.01	0.950	.641	
	3	3.26	0.856	.757	
	4	3.18	0.838	.402	
	5	3.45	0.906	.556	
	6	3.24	0.910	.620	
	7	3.35	0.822	.688	
	8	3.12	0.965	.830	
	9	3.15	0.911	.862	
	10	3.26	0.853	.647	
Readiness	1	3.42	0.767	.599	0.803
	2	3.42	0.847	.712	
	3	3.38	0.852	.761	
	4	3.45	0.813	.671	
	5	3.37	1.034	.758	
	6	2.71	1.024	.627	
	7	2.73	0.999	.834	
	8	3.26	0.896	.758	
	9	3.39	0.806	.739	
	10	3.39	0.778	.408	

According to Nunnally (1978), a Cronbach's Alpha score of 0.70 or higher is considered to show proof of internal consistency. The results of exploratory factor analysis of readiness show that

values of Cronbach's Alpha are higher than 0.80. As shown in the Table 2, acceptable reliability is demonstrated for each of the variables: 0.846 for farmer attitude, 0.803 for farmer readiness.

Analysis of Variance

This study conducted a one-way ANOVA to compare assessment of attitude and readiness between two countries. The findings suggest that in terms of attitude, there is no significant different between two countries ($p > 0.05$). Those findings answer the first research question concerning the attitude towards organic farming implementation which the Indonesian farmers have positive attitude $M=3.83$ ($SD=0,507$) and Taiwanese farmers also have positive attitude $M= 3,94$ ($SD= (0.473)$). Meanwhile, this study found that there is significant different ($p > 0.05$) of readiness between Indonesia $M=3,23$ ($SD=0.477$) and Taiwan $M= 3,81$ ($SD=0,437$).

Table 3. Descriptive statistics and Oneway ANOVA

No	Variables	Indonesian Farmers (n=120)		Taiwanese Farmers (n=120)		F value	Sign
		Mean	SD	Mean	SD		
1	Attitudes	3.83	0.507	3.94	0,473	0.041	0.839
2	Readiness	3.23	0.477	3.81	0.437	11.36	0.000

* $P < .05$

** $P < .01$

Those findings answer the second research question concerning the readiness level towards organic farming implementation that the Indonesian farmers as being not ready for organic farming implementation compare with Taiwanese farmers. The study suggests that further work needs to be done before the implementation of organic farming in Indonesia.

Indonesian Farmer Attitude and Readiness

Table 4 shows that overall demographic variables gender, age, education, main job, farming experiences and land area demonstrates not significant difference within farmer of both readiness and attitude. These findings indicate that demographic variables differences not influence the attitude and readiness of farmers in implementation of organic farming in Indonesia.

Table 4. Oneway ANOVA among Characteristics Demography toward attitudes and readiness

INDONESIA						
Variables	Demographic	N	Attitude		Readiness	
			Mean	F value ^a	Mean	F value ^a
Gender	1. Male	98	3.927	0.429	3.261	2.731
	2. Female	22	3.989		3.116	
Age (years old)	1. < 30	11	4.161	1.088	3.030	1.550
	2. 30 – 40	25	3.955		3.160	
	3. 40 – 50	44	3.940		3.301	
	4. 50 – 60	35	3.883		3.248	
	5. > 60	5	3.940		3.230	
Education	3. Elementary school	10	3.906	1.518	3.186	1.750
	4. J High school	85	3.961		3.227	
	3. Senior high school	4	4.300		2.820	
	4. Bachelor degree	21	3.824		3.327	
Main Job	1. Farmers	75	3.959	1.256	3.212	1.695
	2. Breeders	10	3.850		3.356	
	3. Entrepreneur	5	3.733		3.250	
	4. Civil servants	8	4.023		3.292	
	5. Private employee	20	4.004		3.308	
	6. Teachers	1	3.150		2.450	
	7. Others	1	3.800		2.800	
Farming Experiences (Years)	1. 0-5	30	4.004	2.372	3.181	0.678
	2. 5-10	28	4.036		3.198	
	3. 10-15	52	3.857		3.273	
	4. > 15	10	3.940		3.230	
Land area	1. < 2000	87	3.844	5.873	3.299	6.005
	2. 2000-5000	21	4.108		3.231	
	3. 5000-10.000	12	4.133		3.250	

*P< 0.05

**P<0.01

Taiwanese Farmer Attitude and Readiness

Table 5 shows that overall demographic variables gender, age, education, main job, farming experiences and land area demonstrates not significant difference within farmer of both readiness and attitude. These findings indicate that demographic variables differences not influence the attitude and readiness of farmers in implementation of organic farming in Taiwan.

Table 5. Oneway ANOVA among Characteristics Demography toward attitudes and readiness

TAIWAN						
Variables	Demographic	N	Attitude		Readiness	
			Mean	F value ^a	Mean	F value ^a
Gender	1. Male	90	3.924	0.008	3.821	0.445
	2. Female	30	3.944		3.171	
Age (years old)	1. < 30	14	4.087	1.131	3.858	0.241
	2. 30 – 40	22	3.891		3.778	
	3. 40 – 50	30	3.936		3.795	
	4. 50 - 60	29	3.929		3.830	
	5. > 60	25	3.678		3.733	
Education	1. Not complete high school	10	3.955	1.006	3.705	0.433
	2. High school Complete	64	3.958		3.811	
	3. University complete	38	4.200		3.950	
	4. Graduate school complete	8	3.831		3.834	
Main Job	1. Farmers	84	3.923	0.144	3.798	0.700
	2. Breeders	9	3.700		3.755	
	3. Entrepreneur	3	4.063		3.918	
	4. Civil servants	8	3.887		3.862	
	5. Private employee	10	4.029		3.870	
	6. Teachers	3	3.966		3.833	
	7. Others	3	3.933		3.433	
Farming Experiences (Years)	1. 0-5	15	3.973	0.396	3.851	0.438
	2. 5-10	37	3.918		3.781	
	3. 10-15	42	3.901		3.788	
	4. > 15	26	2.929		3.807	
Land area	1. < 2000	87	3.866	1.968	3.299	6.005
	2. 2000-5000	21	4.002		3.231	
	3. 5000-10.000	12	4.100		3.250	

*P < .05

**P < .01

Those findings at Table 4 and 5 answer the third research question concerning the influence of demographic variables (regency, gender, age, education, main job, job experience, land ownership) of farmers' perception of attitude and readiness towards organic farming implementation. These results indicate that demographic variables differences not influence the

attitude and readiness of farmers in implementation of organic farming both in Taiwan and Indonesia.

Conclusion

This study will help the policy makers both of two countries to recognize the differences of attitude and readiness on implementation toward organic farming. In terms of attitude, there is no significant different between two countries, those findings answer the first research question concerning the attitude towards organic farming implementation which the Indonesian and Taiwanese farmers have positive attitude. Meanwhile, this study found that there is significant different of readiness between Indonesia and Taiwan. Taiwanese farmer more ready to implement organic farming compare with Indonesian farmers This study suggests that further work needs to be done before the implementation of organic farming in Indonesia. This study also found that demographic variables differences not influence the attitude and readiness of farmers in implementation of organic farming both in Taiwan and Indonesia.

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