

# Understanding of the Fruit Farmers' Adoption Intention toward Organic Farming

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DOI: <https://dx.doi.org/10.47772/IJRISS.2024.803190>

Received: 09 March 2024; Accepted: 18 March 2024; Published: 23 April 2024

## ABSTRACT

Organic farming practices have been encouraged in Malaysia's agricultural industry to promote sustainable and environmentally friendly growth. Besides, it is also in line with Sustainable Development Goals (SDG) which are goals number three (SDG 3) and thirteen (SDG 13). Johor is a state located in the southern region of Peninsular Malaysia with varieties of fruits planted such as pineapple, durian, and other local fruits. Hence, based on the data from the Department of Agriculture (DOA), Johor recorded the highest number of fruit farmers with 36,655. However, only 5 of the fruit farmers in Johor received the Malaysian Organic Certification Scheme (myOrganic). Thus, the purpose of this research is to develop a framework for intention on organic farming practices to ensure food safety and security among fruit farmers in Malaysia. The Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM) were employed in this study. Through quantitative research design, the questionnaire was distributed to the 119 fruit farmers in Johor by using simple random sampling. In this study, SPSS version 26.0 was used and data was examined by using a descriptive test, and Spearman's test. The findings of this study concluded that the mean score on adoption intention among fruit farmers in Johor was  $M= 2.5966$  which is categorized as a moderate mean value. Meanwhile, the results for the relationship between all the factors significantly influence on organic farming adoption intention. This study can contribute to the literature and provide a better understanding of the factors that influence the intention on organic farming including factors of attitude and perceived ease of use.

**Keywords:** Organic Farming Adoption, Attitude, Perceived Behavioral Control, Perceived Usefulness, Perceived Ease of Use, Adoption Intention, TAM, TPB

## INTRODUCTION

The term food security is frequently discussed worldwide. Food security refers to food self-sufficiency,

sustainable agriculture, and development to achieve long-term food security (Moniruzzaman et al., 2021). Sustainable agriculture encourages people to use organic farming practices and to approach farming in a flexible, adaptable, and understanding way by choosing production techniques that are friendly to the environment (Bouttes et al., 2019). This method is different from the majority of modern farming techniques, which tend to use chemical substances in farming (Altieri, 2018). Sustainable farming can help the environment by reducing pollution, increasing diversity, long-term soil fertility, and negligible soil erosion. (Das et al., 2022). By combining innovation, science, and tradition, IFOAM believed that organic agriculture could improve human, soil, and ecosystem health (Geier, 2007).

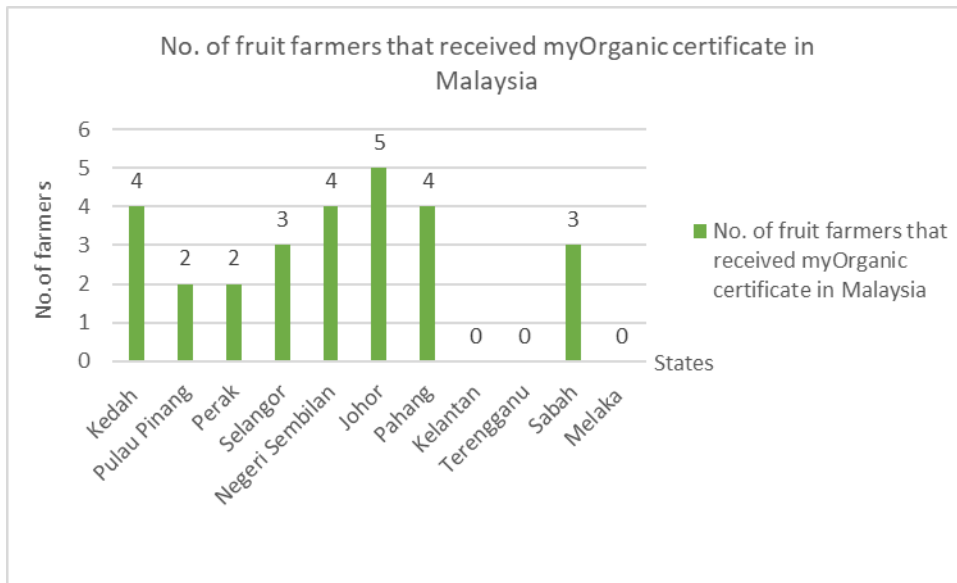
Organic accreditation and certification systems are primarily used to set organic rules for farmers in the development of organic farming (Willer et al., 2019). Early in the 1970s, the organic certification program was created as a quality control measure (Fetter and Caswell, 2002). All over the world, including in Asia, organic products are in high demand. (Eyinade et al., 2021). Additionally, to produce and sell any product in the market, any producer must adhere to a specific set of standards and regulations (Kumar et al., 2023). Likewise, for products that make the claim to be organic, they must be produced properly by a set of guidelines from certification bodies including The Codex Alimentarius, Asia Regional Organic Standard (AROS) and the certification body specific to the respective country (Huber et al., 2015).

The agriculture industry in Malaysia is rapidly growing year by year including the fruit industry (DOA, 2023). Fruits are an important group of food crops that give significant sources of vitamins and minerals in Malaysians' daily diets. However, organic farming practises are not widely adopted by Malaysian farmers. (Abu, 2020; Mohamed Haris, 2019). The low of adoption organic farming practices occurs because not all farmers are willing to implement organic farming practises because they are unable to fulfill the commitment to organic practices set by the Department of Agriculture Malaysia (DOA) (Baker et al., 2022). Moreover, DOA created the Malaysian Organic (myOrganic) certification to give recognition to farmers operating organically by Malaysian Standard MS1529:2015 (Hee and Lin, 2021). According to data from DOA, there are 148,492 fruit farmers in Malaysia. Unfortunately, there are only 27 fruit farmers (Fig. 1) have registered for myOrganic certificate (DOA, 2023). It shows that the number of farmers taking myOrganic certification is very critical due to the low adoption of organic practices.

The purpose of this research is to identify the intention of organic farming among fruit farmers. Based on the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM), these theories have proven to be valuable tools for measuring the adoption intention behavior among farmers on adopting organic farming. As a dependent variable, organic farming adoption intention was used while Attitude (A), Perceived Behaviour Control (PBC), Perceived Usefulness (PU), and Perceived Ease of Use (PEU) were used as independent variables. Additionally, a prior study revealed that the majority of researchers used TPB and TAM in their research on the adoption of organic farming because these theories most influence and widely adopted to predict acceptance or adoption technology behavior (Saadiah, 2021; Bakar, 2022).

Hence, this study determines the level of A, PBC, PU, and PEU towards organic farming adoption intention among fruit farmers in Johor and helps the researchers to comprehend the factors influencing organic farming adoption intentions. The following are the objectives of this study:

1. To determine the level of organic farming adoption intention, attitude, perceived behavioural control, perceived usefulness and perceived ease of use toward organic farming adoption intention among fruits farmers in Johor.
2. To analyse the relationship between attitude, perceived behavioural control, perceived usefulness and perceived ease of use with organic farming adoption intention among fruits farmers in Johor.



**Fig. 1 Number of fruit farmers that received myOrganic certification**

(Source: Senarai Penerima Sijil myOrganic, Department of Agriculture (DOA), 2023)

## METHODOLOGY

### Instrument Development and Pre-survey

There were six sections in this survey questionnaire. The first section contained seven questions about the respondents’ demographic information, specifically their age, gender, race, education level, and income per harvest. The question in section two is about the farming profile consisting of planting area, type of crop, type of farming method, and myOrganic certification application. The questions in sections three to six were developed based on the variables of this study which are Attitude (A), Perceived Behaviour Control (PBC), Perceived Usefulness (PU), and Perceived Ease of Use (PEU) and organic farming adoption intention. Before the questionnaire was distributed, to determine the instrument’s reliability a pilot test was conducted on approximately 30 fruit farmers. Responses were measured using a five-point Likert scale (Likert, 1932). The analysis was also used on the Likert Scale questionnaire to determine the percentage, mean score, and standard deviation of each question. To measure the mean score, the range of mean score for the level low is (1.00-2.33), for the level medium is (2.34-3.66) and for the level high is (3.67-5.00) (Amlus et al., 2015). The questionnaire was distributed to the respondents among the fruit farmers in Johor because Johor has the highest number of fruit production, 796,215 mt (DOA,2023). In this study, 119 fruit farmers in Johor were selected by using simple random sampling techniques. Both in-person and phone interviews were employed to conduct the survey.

## RESULTS AND DISCUSSION

### Socio-Demographic profile of fruits farmers

According to Table 1, the majority of fruit farmers who participate as respondents are over 61 years old (31.1%), with a minor percentage being under 30 years old (7.6%). The mean value for age was 3.47 mean value Hence, it is possible to conclude that the majority of farmers who enter the agricultural sector are elder farmers as opposed to young farmers. Supported by Leavy and Smith (2010), young people are not interested in pursuing a livelihood in agriculture, particularly as farmers, because they perceive this sector to be risky and challenging. In addition, 85.7% of fruit farmers are men, while 14.3% are women. Moreover,

68.9% of Malay people are farmers compared to 31.1% of Chinese people. In terms of education level, Secondary School has the highest percentage of respondents (49.6%), while Degree has the lowest percentage (2.5%). According to this study, the majority of fruit farmers' planting area is less than 1.00 ha (51.3%), compared to between 5.01 ha to 10.00 ha only (2.5%). The majority of respondents (48.7%) earn less than RM 5,000.00 per harvest. However, 97.5% of respondents had never applied for my Organic certification, compared to 2.5% who had. Meaning that my Organic certification is still not widely known among fruit farmers.

Table 1: Socio-Demographic profile of fruits farmers (n=119)

Respondents Profile		Frequency (f)	Percentage (%)	Mean
Age	<30 years' old	9	7.6	3.47
	31- 40 years old	24	20.2	
	41- 50 years old	25	21	
	51- 60 years old	24	20.2	
	>61 years old	37	31.1	
Gender	Male	102	85.7	-
	Female	17	14.3	
Race	Malay	82	68.9	-
	Chinese	37	31.1	
Education level	No school	38	31.9	-
	Primary	10	8.4	
	Secondary	59	49.6	
	Certificate	4	3.4	
	Diploma	5	4.2	
	Degree	3	2.5	
Farm size (ha)	< 1.00	61	51.3	-
	1.01-5.00	51	42.9	
	5.01-10.00	3	2.5	
	>10.01	4	3.4	
Income per harvest (RM)	<RM5,000	58	48.7	1.58
	RM5,001-RM10,000	54	45.4	
	>RM 10,001	7	5.9	
myOrganic certificated	Yes	3	2.5	1.57
	No	116	97.5	

**Level of the factors towards organic farming adoption intention among fruit farmers.**

The level of Attitude (A), Perceived Behavioral Control (PBC), Perceived Usefulness (PU), Perceived Ease of Use (PEU), and organic farming adoption intention among fruit farmers in Johor have been measured by using descriptive analysis (Table 2). The mean score shows the effect of organic adoption intention was M= 2.5966, while SD=0.41990 which is categorized as the moderate mean value. The level of organic adoption intention among fruit farmers shows a moderate level. The statement was supported by Berbec et al., (2018) their study also revealed that the level of adoption in sustainable agriculture was medium. Another supported statement by Nandi et al., (2015) highlighted that farmers need to face a lot of problems such as a decrease in income during the conversion period to apply for certification because the fee is expensive, and

organic production has no specific subsidies provided.

The mean score which clarifies the effect of A was  $M=3.7109$ , while  $SD=0.36703$  which is categorized as the high mean value. It is possible to state that the level of A of fruit farmers towards organic farming practices is high. Supported by Malek-Saeidi et al., (2012), their studies also revealed that A has a high mean score on organic farming practices among the farmers.

The level of PBC of fruit farmers towards organic farming adoption intention is moderate mean level. The mean score expresses the effect of PBC with  $M=3.2118$ , while  $SD=0.53444$ . This statement was supported by Issa and Hamm (2017) who concluded that PBC has an average level of organic production conversion.

The mean score which discussed the effect of PU was  $M=3.4989$ , while  $SD=0.37270$  which is categorized moderate mean value. This shows that the level of PU of fruit farmers towards organic farming practices can be accepted at the average level. According to Adrian et al., (2005) stated that the producers who PU are more likely to adopt agriculture technology.

The mean score indicates the effect of PEU was  $M=3.8599$ , while the standard deviation is  $SD=0.40302$  which is categorized as a high mean value. It could be argued that the PEU of fruit farmers toward organic farming practices is high and this is a driving factor. According to previous study, Aubert et al., (2012) concluded that PEU has significant effects on agricultural technology decisions.

**Table 2: Descriptive Analysis of all factors The Spearman's correlation**

Variables	Items	Mean	Standard Deviation
Organic adoption intention	I am interest in practicing OF	2.34	0.694
	I think OF is simple farming practice	3.03	0.275
	I perceived OF can increase quality of fruits crop	3.09	0.319
	I know the right management of OF	2.55	0.62
	I am expecting the OF is faster in producing fruits	2.29	0.599
	I am expecting the OF easily to manage	2.28	0.581
		2.5966	0.4199
A	I know OF can control greenhouse effects	3.76	0.482
	I am confident OF gives a profit to me	3.13	0.671
	I am aware the benefits of OF practice	4.08	0.754
	I believe OF can reduce global warming	3.95	0.315
	I believe OF can cause better quality of life	3.63	0.79
		3.7109	0.36703
PBC	The cost of OF practice is low	3.08	0.865
	I prefer to adopt OF because can reduce pest	3.08	0.296
	I prefer to adopt OF because can gain profits	3.05	0.832
	I prefer to adopt OF because can reduce pollution	3.45	1.206
	I prefer to adopt OF because can safe human health	3.4	0.51
		3.2118	0.53444
PU	I perceived OF can give fertility of land in long term	3.48	0.58
	I think OF is friendly to environment	3.09	0.291
	I perceived the OF practice can promote healthy life	3.27	0.88

	I think OF practice can produce high quality yield	3.39	0.491
	I perceived OF can control crop pest and disease	2.55	0.606
	I perceived the OF is ease to manage and handle	3.66	0.525
	I realize the OF can improve food security	4.25	0.571
	I am aware OF can prevent from chemical residue	4.29	0.57
		3.4989	0.3727
PEU	I perceived OF can give fertility of land in long term	4.28	0.581
	I think OF is friendly to environment	4.26	0.589
	I perceived the OF practice can promote healthy life	4.24	0.62
	I think OF practice can produce high quality yield	4.28	0.581
	I perceived OF can control crop pest and disease	3.06	0.27
	I perceived the OF is ease to manage and handle	3.05	0.287
	3.8599	0.40302	

The Spearman correlation coefficient is used to measure the strength and direction of the association between two variables. The Spearman's correlation is used to identify the relationship between Attitude (A), Perceived Behavioral Control (PBC), Perceived Usefulness (PU), and Perceived Ease of Use (PEU), with organic farming adoption intention among fruit farmers in Johor. As a result of the correlation analysis, table 3 shows that all the variables which are A, PBC, PU, and PEU are significant with organic farming adoption intention. Supported by Abid and Jie, (2021) their study revealed that, mostly the factors of the A and PBC positively significantly influenced organic farming adoption intention. The results concluded that the hypothesis for this study was accepted which are:

$H_1$ : Attitude significantly influence on organic farming adoption among fruit farmers in Johor.

$H_2$ : Perceived behavioral control significantly influence on organic farming adoption among fruit farmers in Johor.

$H_3$ : Perceived ease of use significantly influence on organic farming adoption among fruit farmers in Johor.

$H_4$ : Perceived usefulness significantly influence on organic farming adoption among fruit farmers in Johor.

**Table 3: The relationship between the factors toward organic farming adoption intention**

Correlations							
		A	PBC	PU	PEU	Adoption Intention	
Spearman's rho	A	Correlation Coefficient	1	.858**	.890**	.859**	.434**
		Sig. (2-tailed)	.	0	0	0	0
		N	119	119	119	119	119
	PBC	Correlation Coefficient	.858**	1	.883**	.773**	.565**
		Sig. (2-tailed)	0	.	0	0	0
		N	119	119	119	119	119
	PU	Correlation Coefficient	.890**	.883**	1	.817**	.506**
		Sig. (2-tailed)	0	0	.	0	0

	N	119	119	119	119	119
PEU	Correlation Coefficient	.859**	.773**	.817**	1	.369**
	Sig. (2-tailed)	0	0	0	.	0
	N	119	119	119	119	119
Adoption	Correlation Coefficient	.434**	.565**	.506**	.369**	1
	Sig. (2-tailed)	0	0	0	0	.
Intention	N	119	119	119	119	119

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## CONCLUSIONS AND RECOMMENDATION

This paper attempted to determine the level of intention in organic farming practices (dependent variable) and the level of A, PBC, PEU, and PU (independent variables). The results of this study indicate the level of intention on organic farming among fruit farmers in Johor was  $M = 2.5966$ , while  $SD = 0.41990$  which is categorized as a moderate mean value. The levels of PBC and PU were also recorded as moderate mean values. However, the level of A and PEU is a high mean value. Meanwhile, this study also determines the relationship between all the independent variables toward organic farming adoption intention. The result revealed that the relationship between all the independent variables significantly influenced organic farming adoption intention and the hypothesis for this study was accepted.

Most farmers not adopting organic farming practices and are not aware of the myOrganic certification program promoted by the Department of Agriculture (DOA). They tend to adopt conventional farming practices instead of organic farming practices due to low awareness of sustainable farming and organic certification. To find a solution to the lack of applying organic certification, farmers should maintain good relations with the government to obtain information about myOrganic certification and organic farming practices. Additionally, for further study, the researchers need to apply other theories of adoption to reveal other factors that might affect farmers' intentions towards practicing organic farming.

## ACKNOWLEDGEMENT

The research on which this paper is based was funded by Malaysia Ministry of Higher Education (MoHE), Fundamental Research Grant Scheme (FRGS/1/2002/SS02/UMK/03/4). The authors are extremely grateful to the Department of Agriculture in Johor for providing a list of fruit farmers' names as well as the research data required.

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