

Factors affecting the intention of organic agricultural behavior in Tidore City

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Abstract. Organic farming is an alternative to the failure of the green revolution that has been promoted in recent decades. Shifting farmer's behavior to organic farming has many obstacles. Many factors influence farmers to do organic farming. This research aims to determine the factors that influence farmers' intentions or intentions in organic farming, with a theoretical framework of Planned Behavior theory. The research method was designed as a quantitative research with a survey approach. The sampling technique in this study used a multistage cluster sampling technique while the sample of this research is part of the population taken by a sampling of 75 respondents. The results of the study show that the factors that have a significant influence on farmers' intention to carry out organic farming are, social norms factor: the support from the surrounding environment, the perception of personal control (PBC), and the perception of organic farming risks. These three factors have a strong influence on the desire of farmers to implement organic farming in Tidore. The implication is that to accelerate the shift in behavior change to organic farming, and the stakeholders need to consider these three factors.

1 Introduction

In the last few decades, the agricultural development system or paradigm has shifted. The application of an agricultural system that depends on external input (heavy input) has been proven to harm complex problems, including on soil damage, the ecosystem also human health [1]. Agriculture that prioritizes external input has been shown to cause reduced genetic diversity, increased susceptibility to pests, higher soil erosion, water contamination, depletion of natural resources, reduced soil fertility, micronutrient deficiencies, soil contamination, and other problems (Greenpeace, 2003).

The new agricultural model paradigm or perspective emphasizes sustainable agricultural development by optimizing organic inputs that are locally available and environmentally friendly. Thus, one form of sustainable agriculture is organic farming by utilizing local resources. Organic agriculture is increasingly popular worldwide since it can diversify agricultural production systems towards achieving increased productivity, agricultural and food incomes, and environmental security [2]. The organic farming pattern aims to increase

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the quality and quantity of production through the fertilization process and does not use other inorganic supporting materials in its implementation. This system focuses on polyculture cropping, crops rotation, utilization of residual crops, the use of manure and green manure, proper soil cultivation, and biological control of pests and diseases [3].

Based on the survey data, it is known that organic agriculture development has developed well in 123 countries [4]. Almost 31 million hectares of agricultural land are managed organically (data at the end of 2005). Despite global awareness of environmental degradation and climate change resulting from inorganic farming practices, many farmers in developing countries still produce crops inorganically. [2]. Herath, 2013). As a result, the development of organic agriculture in developing countries is relatively slow compared to developed countries [5]. Farmers' attitudes and perceptions are the main factors that lead to the adoption of organic agriculture [6].

One of the cities, which implements the organic agriculture, is Tidore Islands City. Tidore consists of eight sub-districts (Tidore District, East Tidore District, North Tidore District, South Tidore District, Oba District, North Oba District, Central Oba District and South Oba District with 72 villages/wards. Most of Tidore population work as a farmer and a fisherman. The Tidore area is directed as a city that functions as a regional and island growth centre which is oriented to encourage the growth of agricultural production of food crops, annual crops, mining and processing industries [7].

One of the efforts to encourage the development of organic agriculture, various stakeholders participate in changing farmers' attitudes and behavior to carry out environmentally friendly agriculture. There are multiple private and government activities to increase public awareness to carry out organic farming. In collaboration with Assessment Institute for Agricultural Technology (AIAT/BPTP) North Maluku and the Agriculture Service, Bank Indonesia provides Integrated Ecofarming Training Based on Microbacter Alfaafa for members of the chili cluster, onion cluster, rice cluster agricultural agency employees, other farmers in North Maluku (Indonesia, 2018). Kodim 1505 /Tidore Islands conducts training on organic fertilizers in increasing eco-friendly agriculture (Fatah 2017). Agricultural BPTP routinely assists farmers in creating Organic Independent Villages [8].

Various activities to accelerate the development of organic agriculture in the city of Tidore have been carried out. Unfortunately, the productivity of organic agriculture is still relatively low. Many factors influence the farmer's intention to cultivate organic agriculture [9]. Attitudes and perceptions of personal control affect farmers' intention to adopt organic farming. Meanwhile, intention behavior revealed that norm attitudes, risk perceptions, and government support have a positive effect on intentions of organic farmer groups [10].

Many studies currently apply the Theory of Planned Behavior (TPB) to predict specific behavioral intentions. Individual behavior is influenced by personal attitudes towards objects, social norms or environmental support for behavior, and perceived behavioral control [11]. A literature review found several previous studies on behavioral intention [12]. Wang, Pacho, Liu, & Kajungiro (2019) have implemented the Theory of Planned Behavior (TPB) and have confirmed their model [13]. This study aims to explore and find the factors that influence farmers to carry out organic farming with a theoretical framework of planning action based on the above background. The framework of this research can be described as follows;

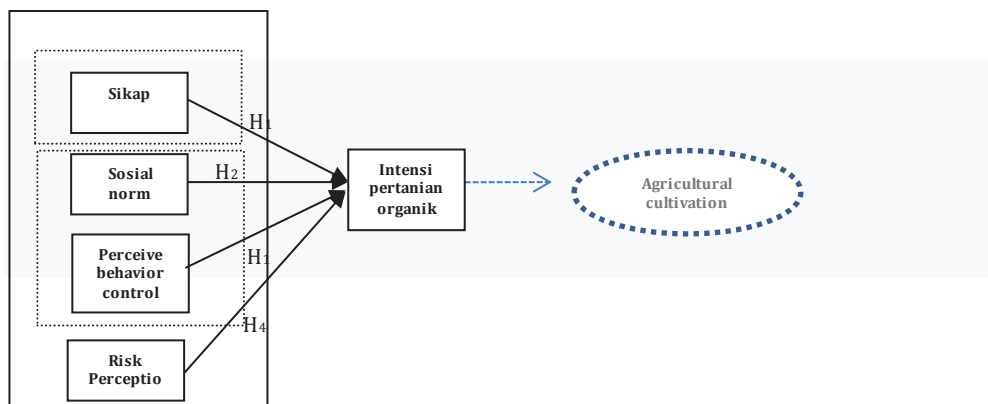


Fig. 1. Research Hypothesis Framework

2 Research methods

This research activity is carried out with a quantitative research approach with a survey method. This study seeks to identify factors that influence farmers' intentions in organic farming behavior based on the study's objectives. The survey method is a research conducted by collecting data from all members of the population. The characteristic of the data collection through surveys is that the data is collected from several respondents by making and distributing questionnaires[14]. The survey method used in this research allows the researcher to generalize to a population based on the analysis of the population sample.

The research was conducted in Tidore City in North Maluku Province. The research was conducted from December 2019 to January 2020. The population of this study was farmers of vegetables and secondary crops. The sampling technique in this study used a multistage cluster sampling technique while the sample of this research is part of the population taken by a sampling of 75 respondents.

Table 1. Distribution of respondent by sub district.

No	Sub district	n
1	Akekol	9
2	Ampera	10
3	BalBar	3
4	Bukit	6
5	Galaga	8
6	Garajo	6
7	Gurapi	1
8	Oba	6
9	Sofifi	14
10	Somaho	12
	Sum	75

In answering the research objectives, the data analysis used was multiple linear regression analysis. The regression function in this study is described in the following equation:

$$Y = a \pm b_1 X_1 \pm b_2 X_2 \pm b_3 X_3 + e$$

Where:

Y : Behavioral intention

a : Constants

b : Correlation coefficient

X1 : Attitude

X2 : Social norm

X1 : Perceived Behavior Control

X3 : Perceived risk

3 Results and discussion

In the last few decades, the green revolution program has had various impacts, both on health and the environment. The development of organic agriculture in developing countries is relatively slow compared to developed countries. Multiple studies have previously revealed many factors that influence farmers' low awareness and intention to adopt organic farming. Agriculture that puts forward massive heavy input from outside has caused serious environmental pollution and damage. Various efforts have been made to encourage the development of organic farming in Tidore. Various stakeholders participate in changing the attitude and behavior of farmers to do environmentally friendly agriculture. There are various activities, both the private sector and the government, to increase farmers' awareness of doing organic farming.

Tidore is an archipelagic city, most of whose residents make agricultural and plantation livelihoods [15]. Agriculture is a livelihood for generations of the people in Tidore. Agricultural commodities commonly cultivated by farmers in Tidore include crops, vegetables, and also plantation commodities.

3.1 The intention and behavior of organic farming among farmers in Tidore

The organic farming system pattern aims to increase crop yields (both in quality and quantity) by fertilizing with organic materials and in its implementation it does not use other inorganic supporting materials. This agricultural system prioritizes environmental sustainability. It promotes multi-crop cultivation system (polyculture), crop rotation system, utilization of residual crops, utilization of organic waste in both livestock and green manure, integrated soil processing, and pest control systems and biological disease [3].

Most of the farmers in Tidore cultivate rice, secondary crops, and vegetables. The agricultural pattern carried out by the farmers usually uses an intercropping pattern with several types of plants on agricultural land. Some farmers have started using organic fertilizers and biological pesticides to substitute or replace inorganic fertilizers and chemical pesticides to fulfill the need for fertilizers and control pests and diseases. Although not all farmers cultivate organic farming, more and more farmers are substituting inorganic fertilizers and pesticides with more environmentally friendly inputs. The behavior of organic agriculture carried out by the respondents can be described in Table 1. Following:

Table 2. Distribution of respondents' organic agriculture behavior

No	Organic Farming Behaviours	F	Percentage (%)
1	Very low < 25 %	7	9.46
2	Low 25-50 %	10	13.51
3	Average 51-75 %	28	37.84
4	High >75 %	24	32.43

Source: primary data analysis

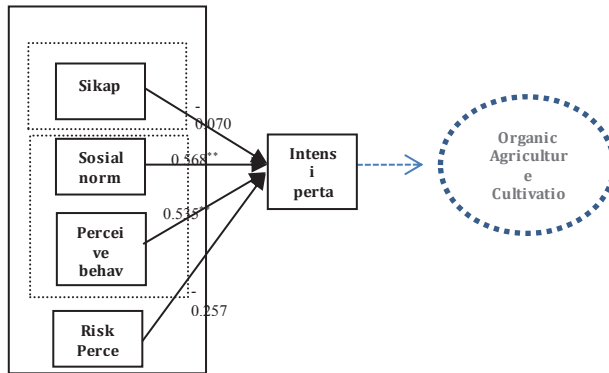
Based on Table 1 above, it is known that most farmers have relatively optimized environmentally friendly inputs in agricultural business. Some of these activities can be identified from agricultural businesses that use manure as a partial substitute for chemical fertilizers and biological pesticides to prevent and control plant pests. In addition to manure to increase soil and plant fertility, some farmers use *bokasi*, MOL (local microorganism), and rice washing water. Meanwhile, some farmers have used leaf extracts of plants such as soursop leaves in controlling plant pests.

3.2 Factors that influence the behavior intention of farmers in organic farming

The behavior of farmers to carry out agricultural cultivation organically is very much influenced by many factors, both internal and external. Psychological conditions, the external environment, information literacy, and various other factors theoretically contribute to individual behavior. In this study, researchers used the theory of planning behavior as a theoretical framework. It explains where the factors that influence individual behavior intentions are the farmers' attitudes about the concept of organic agriculture, social environment or social norm -- the support of local people to carry out organic farming, individual perceptions of behavior or the views of the individual's ability to perform behavior. In addition, to the three factors above, this study examines the perception of risk on intention. Many studies have confirmed that risk perception has a strong influence on behavioral purposes.

In answering the research objectives, the hypothesis of this research assumes that attitudes, subjective norms (social norm), perceptions of behavior, and perceptions of the risks of organic farming influence individual intentions in carrying out the behavior using organic farming techniques. Attitudes are mental and neural conditions derived from experience, which direct and dynamically influence individual responses to all related objects and situations. Subjective norms relate to a person's view of a situation or event and feelings that arise when they do not follow other people's opinions on a situation or event. Subjective norms are people's perception of social pressure to do or not behave [11]. Perceived behavioral control refers to people's perceptions of the ease or difficulty of performing the behavior of interest. Behavior control plays an essential role in the theory of planned behavior and is a refinement variable of reasoned action theory.

In answering the research objectives, the researcher conducted multiple linear regression analysis with the backward method using SPSS for windows. It is known that the factors that influence the behavior intention of organic farming are described in the figure below;



Source: Primary Data Analysis

Fig. 2. Analysis of factors influencing farmers' intentions in organic farming

Based on the results of the analysis above, it is found that the factors that significantly influence the behavior intention of organic farming are aspects of social norms, personal control perception (PBC), and perception of risk. Meanwhile, the attitude variable does not have a significant effect. From the results of the analysis, it is known that the coefficient of determination in this study is 0.636 or 63.3 percent. It shows that the farmer's intention in organic farming can be explained by the three variables above at 63.6 percent, while external factors influence the rest or 36.7. From the results of the above analysis, it can be described in the regression equation as follows;

$$Y = 1,42 + 0,57 X_2 + 0,53 X_3 - 0,25 X_4$$

where:

Y : farmer's intention

*X*₂ : Social norms

*X*₃ : Perception of personal control (PBC)

*X*₄ : Perceived risk

Based on the analysis results using the regression test, it is found that social norms have a strong influence on farmers' intentions in organic farming. It is known from the significance value smaller than 0.05 and the t-count value, which is greater than the table. One unit increase in social support encouragement can increase organic farming's behavior intention by 0.57 units. Social norms represent the support of local people for organic farming. Support from the environment to do organic farming can increase the intention.

Based on the interviews results with the farmers in doing organic farming, this behavior has received support from fellow farmers. Moreover, the encouragement from the instructor can foster the farmers' intention to do organic farming. Relatively frequent visits and assistance of the instructor and NGOs to the farmers can accelerate agricultural patterns towards one hundred percent organic farming. The same thing was expressed by [16] who stated that interpersonal interaction and communication with outside parties such as the agricultural service, extension agents, researchers, NGOs, and lecturers, have an enormous and positive contribution in influencing and building thought patterns and agricultural behavior towards organic agriculture [6].

For the perceptual aspect of personal control, this variable has a significant effect on farmers' intention in doing organic farming. This can be seen from the results of the analysis, namely the significance value (0.001) which is smaller than 0.05 with a correlation coefficient of 0.53. This figure shows that an increase in the perception of one unit of personal control can increase the behavior intention of organic farming by 0.53 units. The perceptions

of personal control are farmers' perceptions of their ability to do organic farming - the higher the perception of the ability to do organic farming, the higher the farmer's intention will be. The farmers' perceptions include the farmers' perceptions of being able to make compost, making vegetable pesticides, and accessing it easily.

Based on the results of the analysis of Figure 2 above, it is revealed that the risk perception variable has a significant effect on intention, with a significance value of less than 0.05 and a correlation coefficient value of -0.257. This negative correlation coefficient indicates that the perceived risk harms the farmers' intentions to engage in organic farming. The perceptions of risk are the perceptions of the application of organic agriculture. This negative correlation shows the more significant perceived risk, such as agricultural productivity failure, which causes the farmers to lower their intention. An increase in one unit of perceived risk will have an impact on reducing the intention by 0.257. Some farmers think that not using chemical pesticides will risk the failure of their crops.

4 Conclusion

Organic agriculture is an alternative to the failure of the green revolution, which was promoted in the last few decades. The shift in the farmer behavior to organic farming has many obstacles. Many factors influence the farmers to do organic farming. The farmers in Tidore are mostly crops and plantation farmers who have begun to shift in their agricultural systems by using several environmentally-friendly agricultural inputs such as the use of compost, the use of POC, the utilization of organic waste, and the use of biological pesticides.

Based on the analysis results, the factors that influence the intention of farmers in Tidore to carry out organic farming includes; social norms or support from the surrounding environment. The support from fellow farmers, the instructors, and NGOs become the factor that can accelerate the shift in farmer behavior in organic farming.

Another factor influencing the farmer's intention is the perception of personal control or the farmer's perception of doing organic farming. This perception includes the perception of the ability to do organic farming and the ability to access organic agricultural inputs. Another factor that affects farmers' intentions is the perceived risk. The perceived risk harms the farmers' intentions. The greater the perception of the risk of organic farming failure is, the lower the farmer's intention to do organic farming will be.

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