

Behavior factors affecting the performance and interest of young farmer on the horticulture business in Malang, Indonesia

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ABSTRACT

The development of sustainable agricultural still depends on the role of human resources. Horticultural business in Malang tends to be done by young local farmers with various characteristics, such as individual characteristics, economic environment, social culture, empowerment, and managerial capacity. This study aims to determine the effect of individual characteristics and external environment on the interest of young farmers and horticultural businesses in Malang. The study was conducted using a purposive sampling method with several numbers of 200 young farmers. Data collection was carried out for 3 months (January to March 2019). The data were analyzed using WarpPLS Structural Equation Model. The results showed that the interest of horticultural farming in Malang Regency remains high, while the results of statistical tests showed that the performance of young farmers was influenced by individual characteristics, economic environment, socio-cultural environment, management capacity, and interest. On the other hand, both economic and socio-cultural environment affect performance through the interests of farmers, economic factors, family environment, and individual character, especially in terms of mastery of farming technology and capital which will encourage the interest of young farmers in horticultural farming in Malang, Indonesia.

Key words : Interest in Horticulture, Characteristics, Young farmers

Introduction

Horticulture in Malang is one of the commercial commodities that still brings promising benefits. The horticultural sub-sector still occupies a strategic position in the leading of the agricultural sector in Indonesia. This is based on the display of various macro indicators such as Gross Domestic Product (GDP), export volume, employment, and Farmer Exchange Rates (NTP). Prospects for horticultural commodities in the future will be even greater, especially in terms of awareness of the importance of health. On the other hand, the role of farmers, in this

case, is needed by young farmers who can create an increase in horticultural productivity along with the increasing demand.

The number of main farmers in Malang based on the last agriculture census in 2013 showed the highest number of agricultural businesses which was 328,369 households. It implicates that horticultural farming is still enthused in order to support the production and sustainability of the agricultural sector in Indonesia. This study uses the respondent of young farmers who work on the horticulture and the Structural Equation Model (SEM) WarpPLS method so that there is renewal in this research. This

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study aims to determine the effect of individual characteristics and the external environment on the performance and interest of young farmers in horticultural farming. The external environment includes socio-cultural economy, management capacity, and empowerment.

Farmers as the basic components and driving components that determine the rate of productivity and quality of the agricultural sector are inseparable from the characteristics possessed. Interest is the desire that underlies someone in doing something. A person's interest still depends on daily habits based on the encouragement that comes from every individual that exists. Besides, interest is also interpreted as an action that is done consciously or unconsciously. Besides, the number of farmers in Malang is dominated by elderly farmers (age of 45-54 years) compared to young farmers (age of 35 to 44 years) which is becoming not only a problem in Indonesia but also in other countries, such as Asia, Europe and Canada (Murphy, 2012; European Commission, 2012; Uchiyama, 2014).

From the previous study done by Panurat (2014) showed that the factors which affect the interest are consisted by the land area, education, experience, assistance, and income. From the study, it was found that both the land area and income gave a significant effect on the interest in rice farming compared to other factors. Research conducted by Koranti (2013) concluded that the most influencing effect on the entrepreneurial interest were the entrepreneurial motivation, followed by sequential variables such as personality, family environment, and the surrounding environment. The results showed that both external and internal environment variables will affect the entrepreneurship interest on the students of Universitas Gunadarma both partially and simultaneously.

The study by Mahanani (2014) showed that both the social environment and technology have a positive and significant effect on the entrepreneurial interest. While the variables of self-confidence, task orientation, risk courage, leadership, innovation and creativity, and the school environment do not affect entrepreneurial interest. Other studies done by Erliadi (2015) showed that age, experience, number of family dependents influence the farmers interest in lowland rice farming.

Also, other studies done by Njoroge (2015) analyzed the agriculture performance using the Multiple Linear Regression analytical tool. The study

performed by Abdullah and Sulaiman (2013) showed youth interest in agriculture which includes attitudes, knowledge, family support, and government using Regression analysis.

Research done by Umunnakwe *et al.* (2014) examined the youth interest in agriculture using the scoring method in the family. The factors that influence the involvement among rural youth in agricultural livelihood activities in the Jabalpur district, Madhya Pradesh, India was used as a sample through multistage and simple random sampling then analyzed using multiple linear regression analysis. The dependent variable for this research was the involvement of income-generating activities and was measured using a 3-point Likert scale (fully involved, partially involved and not involved: 2, 1, 0). The factors such as marital status, respondent education, family size, employment status, innovation, conservatism-liberalism, fatalism, contact exposure to mass media, socio-political participation and reasons for education and vocational training influence the involvement of rural youth in agricultural income-generating activities. The results showed that the majority of respondents had high mass media exposure and low contact with an agricultural counselor. The majority of respondents showed medium innovation (42.11%).

Research done by Bednarikofa *et al.* (2016) analyzed the factors that affect the decision of agricultural students from Altai Krai to migrate outside or return to their parents' rural villages after completing their university. The analytical method used was logit to estimate the effect of variables on migration intentions. These variables include the importance of education in the respondent's family (parents' encouragement to study agriculture), family background (land ownership), work expectations (future employment or business sector and difficulty building their own business), quality of life (life satisfaction), and personal background (gender). The dependent variable used was "intention to migrate" which is a binary variable, 0 means "yes" and 1 means "no". The results showed that the probability of leaving the parents' city decreased if (1) the respondent's parents supported the study of agriculture, (2) the respondent's family-owned agricultural land, (3) the respondents intended to work in agriculture, and (4) the respondents believed that they did not find it difficult to build their own business in the city where their parents live.

Another research done by Haggblade *et al.* (2015)

used motivation indicators which include the family background (farming or not) and reasons for entering agriculture as a career (agricultural background, increasing agricultural productivity and rural welfare, agriculture is a good business, interested in science, inspired by professional farmers, and coincidence). The results showed that many young Africans were low motivated and less prepared to have a career in agriculture.

Also, the study done by Felicia *et al.* (2016) evaluated the Future Agriculture in the hands of Rural Youth in the Oriaan Regional Government Region in the Niagara Section of Osun, Nigeria. The study used structural interview and questionnaire method and were analyzed using regression with SPSS tool. The regression result showed that the factors influencing respondents' choices towards a career in agriculture were quite significant. This implied that age, sex, personality, parents, lack of employment opportunity and friends were the main factors that determine the respondent career choices in agriculture.

Furthermore, a study done by Borges & Senger (2017) analysed the psychological factors that underlie farmers intention to diversify their agricultural products. In this research, the TPB (The Theory of Planned Behavior) approach was an individual intention to perform certain behaviors. The results showed that farmers have low intention to diversify their agricultural products and the three TPB indicators which are building subjective norm attitudes and behavioral control were perceived to be positive and correlated with the intention.

From previous studies above, the farming interest has been carried out based on a variety of methods, disaggregation of time, location, and commodity. However, most of the research focuses on certain commodities and groups, and therefore this research aims to contribute and completes more pieces of information from previous studies. One related study was done by Widiyanti *et al.* (2016) which analyzed the level of motivation and factors that influence the farmer motivation on implementing the innovation of corn hybrid varieties. The results showed that there are differences in performance between hybrid and non-hybrid farmers.

Materials and Methods

The 200 farmers sample was carried out using a purposive sampling technique which uses the crite-

ria for determining the sample were only young farmers engaged in horticulture. The data used in this study were using both primary and secondary data which were obtained from interviews and observations of young farmers in Malang which were conducted for 3 months (January to March 2019) and the government agencies to provide additional information respectively.

The data were analyzed using a structural equation model (SEM) through the WarpPLS (Partial Least Square development) approach. The SEM model was used to combine the simultaneous equation system with factor analysis which was used as a method to get latent variables. While the WarpPLS approach was used for a non-recursive model that was complemented by non-linear model analysis. Besides, the WarpPLS method was equipped with a linear model which are both the U and S curve model (sigmoid model) (Solimun *et al.*, 2017). In WarpPLS analysis, there were three types of the algorithm for estimating the outer capital parameter, inner capital, and hypothesis testing algorithms.

Results and Discussion

The Characteristics of Young Farmers in Malang

The young farmers in Malang have an average age of 33 years old with the youngest age is 18 years old and the oldest is 49 years old. Research conducted by Hamilton *et al.* (2015) in the United Kingdom stated that farmers in the 35 to 45 age group showed consistently higher levels of productivity, profitability, and investment. Besides, young farmers consistently show a higher level of involvement in organic farming. Also, a study done by Saiyut *et al.* (2017) in Thailand showed that farmers aged 15-59 can reduce technical inefficiencies in agricultural production while farmers at the age of 60 years and over can not.

Most of the young farmers in Malang are junior high school graduates and only 3.5% completed a bachelor's degree. Higher educated farmers are relatively easier to adopt innovation and usually they will always find new information regarding further innovation to develop their business (Mukti *et al.*, 2017)

The average respondent farming experience is 10 years which has been classified as quite a long experience (Table 1) which can be interpreted that horticultural agriculture in Malang is still profitable un-

Table 1. The Characteristics of Young Farmers in Malang, Indonesia

The Respondents Characteristics	The Respondents Remarks
The average of respondent age	33 yo
a. The youngest	18 yo
b. The oldest	49 yo
The responden last education	
a. Not completed in primary school	7 people (3.5%)
b. Primary school	38 people (19%)
c. Junior High school	86 people (43%)
d. Senior High school	62 people (31%)
e. Diploma/Bachelor	7 people (3.5%)
The average of respondent farming experiences	10 years
a. The least	- (0 year)
b. The longest	35 years

Source: Primary Data Analysis (2019)

til now. The longest farming experiences done is 35 years. The longer the experience been done, the better the farmer knowledge obtained to overcome the various agricultural challenges. Farming experience can influence farmers in making decisions regarding their agricultural development.

Model Analysis

The validity test

The validity test is a tool used to measure the validity of a questionnaire. The questionnaire can be said to be valid if the question can represent something that is measured. The instrument validity test results show that all instruments are valid with a test value (r-value) above 0.30 (Table 2).

The Reliability Test

The Reliability Test is used to measure the questionnaire which is an indicator of the variable. The ques-

tionnaire is declared reliable if the answers are consistent which the instrument always gives the same results even though it is used many times. Table 3 shows that the overall reliability value ≥ 0.6 which means that the measuring instrument used in this study is reliable. Thus, the questionnaire is feasible to be distributed to 200 respondents in this study.

The Result of Outer Model by WarpPLS Analysis

Table 4 shows that all indicators have a positive effect on measuring individual characteristics. Farmer age becomes the most dominant indicator which is forming an individual characteristics. According to Irawan (2012), individual characteristics included age, gender, and education level. While the economic environment become the most dominant indicators of easy access to the capital return (Table 5).

Socio-cultural environment of young horticultural farmers in Malang is measured by three indicators that are reflective in Table 6. Results show that

Table 3. The Result of The Reliability Test

Variable	Standard coefficient alpha	Cronbach's alpha analysis results	Note
Individual	0.6	0.751	Reliable
Economical environment	0.6	0.909	Reliable
Socio-cultural environment	0.6	0.666	Reliable
Empowerment	0.6	0.943	Reliable
Managerial capacity of operation and environmental management	0.6	0.925	Reliable
Young farmer interest	0.6	0.577	Reliable
Young farmer performance	0.6	0.656	Reliable

Source: Primary Data Analysis (2019)

the higher the indicator value resulted, the stronger the socio-cultural environment indicator will be reflected. The community support shows the most dominant indicator reflecting the socio-cultural environment as it is mainly reflected in support indicator from the surrounding community.

The government grants become the most dominant indicator that reflecting the empowerment (Table 7). While the importance of operational roles become the most dominant indicator that reflecting the capacity of operation management (Table 8). The interest of young horticultural farmer in Malang is dominantly formed by the attitude indicator which is the most dominant indicator (Table 9). Furthermore, the net income/profit indicator becomes the most dominant in shaping the performance of young farmers.

The Result of Inner Model by WarpPLS Analysis

The analysis of the inner model is carried out for testing the hypothesis in the research which is done by a partial T-test on each direct influence pathway. Results show that the better individual characteristics on the performance of young farmers (0.168) obtained, the more performance of young farmers will be increased. The age of the farmer is the most dominant indicator in establishing individual characteristics (Table 4). According to (Zagata and Sutherland (2015), farming is done by farmers of

Table 4. The Results of Indicators Testing for Forming Individual Characteristics of Horticultural Young Farmers in Malang

Indicator	Outer weight	p-value
Formal education	0.298	<0.001
Age of farmer	0.311	<0.001
Farming experience	0.265	<0.001
Mastery of technology	0.283	<0.001
Capital	0.239	<0.001

Source: Primary Data Analysis (2019)

Table 5. The Results of Indicators Testing for Forming the Economic Environment of Young Farmers in Malang

Indicator	Outer Loading	p-value
The availability of shops that providing horticultural farming input and equipment	0.855	<0.001
The availability of place to sell horticultural product	0.644	<0.001
More options to sell the horticultural product	0.727	<0.001
Ease place that accommodates horticultural production	0.823	<0.001
Easy access to capital	0.886	<0.001

Source: Primary Data Analysis (2019)

productive age can be done optimally with the existence of physical labor that can improve the performance of the farm.

The influence of the economic environment on the performance of young farmers (0.188) will increase the young farmer performance. The easiness access to the capital is the most dominant indicator reflecting the economic environment. Therefore the existence of financial institutions available to farmers greatly helps farmers in supporting agricultural development and can help to reduce the risks received by farmers (Murphy, 2012; Suess-reyes and Fuetsch, 2016). Besides, the economic environment also affects the interest of young farmers (0.135). According to Ummunnakwe (2014), many factors affect the younger generation to choose to work as a farmer or instead choose non-agricultural jobs that can be proud of in the social and economic side. Thus, youth who own land also have better perception and expectation of their agricultural business (Pujiriyani *et al.*, 2016).

Table 6. The Result of Indicator for Establishing Socio-Cultural Environment of Young Horticultural Farmers in Malang

Indicator	Outer Loading	p-value
Family support	0.591	<0.001
Fellow group members support	0.821	<0.001
Surrounding community support	0.851	<0.001

Source: Primary Data Analysis (2019)

The good socio-cultural environment (0.416) will increase young farmer performance as supported by Wiyono *et al.* (2015) that the family and the surrounding community support are a form of socio-cultural environment that can influence performance and interest as family support can influence to make decisions in the development of agricultural businesses (Pechrová *et al.*, 2018) and also par-

ents can be one of the motivators of the children to be involved in the agriculture area (Adinugraha *et al.*, 2017). The lane coefficient results in a positive value (0.306) which indicates that the better the socio-cultural environment, the more young farmer interest will be obtained. Cavicchioli *et al.* (2018) stated that agricultural work by generations has a greater chance of being passed on by the children. Also, the family farming business that is hereditary is very important for the sustainability of agriculture in the future (Graeub *et al.*, 2016). Thus, the role of the family and the surrounding community is very important to improve the performance and interest of young horticultural farmers in Malang.

The effect of operational management capacity (0.155) such as recording their farming in planning the facilities and the number of workers needed; date of planting; budget before planting; then used production facilities as recommended; and also evaluated the production yield can improve the performance of their farming. While the effect of the interest of young (0.195) which indicates through counseling conducted by the government and information from the trainer, agents can also increase the knowledge of young horticultural farmers in Malang. A study done by Suryabrata (2013) stated that interest is a tendency in individuals to be attracted to an object or like an object. Interest can be formed because of motivation, attitude, and knowledge.

Noramash and K (2010) also stated that knowledge can lead to more skills for youth in preparation for building their entrepreneurship. Also, Nugroho and Waluyati (2018) stated that incentives such as

training will attract many young people to be involved in the agricultural sector. Besides, the support of modern machines will make young people more interest in agriculture as it is easier to manage the commodities. Research conducted by (Pardian *et al.*, 2017) showed that training can provide young farmers with perception and interest in how to cultivate so that they have the will to explore and involve further. Also, the role of the community is very influential on the desire of young farmers to survive in the agricultural sector (May *et al.*, 2019).

Table 9. The Result of Indicators Testing on Forming Interest in Horticultural Young Farmers in Malang

Indicator	Outer weight	p-value
Motivation	0.586	<0.001
Attitude	0.594	<0.001
Knowledge	0.196	0.002

Source: Primary Data Analysis (2019)

The path coefficient of the indirect influence of the economic environment on the performance of young farmers through the interests of young farmers is classified into the mediating variable (Table 12) as well as the interest of young farmers. This shows that the interest of the young farmers is a mediation between the economic environment with the performance of the young farmers and the socio-cultural environment with the performance of young farmers.

The results of WarpPLS-based SEM analysis that examines direct and indirect effects show that per-

Table 7. The Result of Indicators testing for Forming the Empowerment of Horticultural Young Farmer in Malang

Indicator	Outer Loading	p-value
The availability of horticultural cultivation assistance/mentoring	0.862	<0.001
The availability of Government grants	0.920	<0.001
The ability of counsellors/mentor in training	0.748	<0.001
The ability of internal farmer group in managing group	0.773	<0.001

Source: Primary Data Analysis (2019)

Table 8. The Results of Indicators Testing in Forming Empowerment of Horticultural Young Farmers in Malang

Indicator	Outer Loading	p-value
The importance of operational roles	0.483	<0.001
The importance of organising governance activities	0.971	<0.001
The importance of evaluation	0.972	<0.001

Source: Primary Data Analysis (2019)

Table 12. Results of Indirect Effects through SEM analysis

Mediation	The effect testing	Coefficient	p-value	Path segment	Note
Young farmer interest	Individual characters → young farmer performance	0.019	0.199	2 segments	Not Significant
Young farmer interest	Economical environment → young farmer performance	0.037	0.048	2 segments	Significant
Young farmer interest	Socio-culture environment → young farmer performance	0.081	0.009	2 segments	Significant
Young farmer interest	Empowerment → young farmer performance	-0.004	0.748	2 segments	Not Significant

Source: Primary Data Analysis (2019)

formance is determined by 6 variables and 5 of them have direct effects which are individual characteristics, economic environment, socio-cultural environment, management capacity, and interests. While empowerment does not directly affect performance. On the other hand, the economic environment and socio-cultural environment affect performance through farmers' interests, while individual characteristics and empowerment do not.

From the value of direct influence, it appears that the socio-cultural environment has the strongest influence on the performance of farmers (seen from the coefficient of the inner largest model), then followed by the interests of farmers, economic environment, individual characteristics, and operational management capacity. Results showed that the performance of young farmers in Malang was high enough from the test results of the influencing factors which are individual characteristics, economic environment, socio-cultural environment, management capacity and interest of young farmers. While interest of young farmers was influenced by economic environmental factors, socio-economic environment, and empowerment.

Government policies needed to be improved from the economic and empowerment aspect which are credit assistance and insurance from financial institutions can greatly help young farmers to increase the scale of their farming and the counseling both in terms of cultivation, management, and marketing respectively. Managerial knowledge for young farmers is important which will lead to an economically profitable income.

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