

WHAT ATTRACTS RURAL YOUTH TO FARMING? EVIDENCE FROM CENTRAL JAVA

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ABSTRACT

The phenomenon of aging farmers has received severe concern in many countries due to its adverse impact on agricultural productivity. Therefore it is essential to investigate the determinants of farmer regeneration. This study aims to analyze the effect of parents' landholding, education, motor vehicle ownership, and parents' desire on rural youth's interest in becoming farmers. This study is different from the previous ones by adding parents' desire for their children to become a farmer as a new independent variable. The population of this study consists of rural youth aged 15-24 years whose parents are farmers. Cluster sampling was used to select 44 respondents. The data was then analyzed by multiple linear regression. The results show that parents' landholding and parents' desire that their children become farmers have a positive effect, education has a negative impact, and ownership of motor vehicles indicates no effect on the interest of youth to become farmers. These results imply that to increase the interest of the rural child to become farmers, the welfare aspect is a crucial consideration. Therefore, government, schools, and parents need to emphasize understanding the strategic role of agriculture in the economy and make it a promising source of livelihood.

Keywords: *farm regeneration, farm succession, rural youth*

BACKGROUND

Farm succession is an urgent issue related to rural and youth migration, food security, self-sufficiency, sustainability, and the aging of the agricultural sector (Suratha, 2015; Cavicchioli et al., 2018; Kurnia & Iskandar, 2019). The declining participation of youth in agriculture has brought about negative consequences such as the fact that older farmers are less likely to engage in agri-environmental schemes, the increased likelihood of not adopting efficient technologies and infrastructure, and the loss of site-specific knowledge (Suess-Reyes and Fuetsch, 2016; Bertoni & Cavicchioli, 2016; Duesberg et al., 2017).

Youth migration from rural areas has been commonly observed in developed and developing countries (Bednaríková et al., 2016). As summarized by Eistrup et al. (2019), the EU Farm Structure Survey in 2013 showed that 55.8 percent of farmers were > 55 years old and 31.4 percent > 65 years. Only 6 percent of the farmers in the EU are < 35 years old. Employment in urban areas and engagement in nonfarm business enterprises are more viable means to realize youth dreams. This phenomenon was also observed in Indonesia. The National Labor Force Survey (Sakernas) by the Central Bureau of Statistics shows that from 1998-to 2017, the number of people working in the agricultural sector declined from 39.14 million in 1988 to 35.92 million people in 2017. The declining number of youth farmers is not a new phenomenon. Indonesia has long been facing this situation, and the figure continues to increase. The crisis of farmer succession in the villages is evident from the decline in the number of workers in the agricultural sector that occurred in the age group of 15-29 years, with an average reduction of 3.41 percent per year.

BPS noted that within ten years (2003-2013), farm households decreased by 5 million. This figure is quite prominent and impacts the sustainability of the agricultural sector. The majority of the Indonesian farms are household farms, so the decline in the number of workers in the farm sector may negatively impact productivity and disrupt the stability of food security. This is exacerbated by the fact that not only old farmers but agricultural extensions and plant and pest organisms observers are also old; 70 percent are > 50 years old (Wiyono et al., 2015). This certainly affects the performance and sustainability of the national agricultural system.

According to the Farmers Regeneration Study Report published by the People's Coalition for Food Sovereignty (KRKP) in 2015, there were various reasons for the decline in interest in young regeneration in agriculture, one of which is the unfavorable social and economic aspects. The community has stereotyped being a farmer as dirty and often suffering losses. Farmers are a group of poor people, and farmers are still seen as a non-promising profession. Such a perception among youth makes it difficult for the agricultural sector to attract the attention of young workers. They prefer to work as labor in urban areas. Especially with the current situation where many educated youths have been, this has increasingly changed their mindset not to choose agriculture as their livelihood. Ministry of Agriculture in 2013 recorded that the food crop subsector has been dominated by elementary school graduates (40.92 percent), those who do not complete elementary school (23.55 percent), and junior high school graduates (13.88 percent), altogether comprising 78.35 percent. This fact implies that the higher the level of education, the fewer people who engage in agriculture. The combination of age structure and low education of farmers hinder the adoption of new technologies.

The results of previous studies revealed many factors that encourage or inhibit youth interest in engaging in agriculture. Research conducted by Foguesatto et al. (2020) shows that number of family farm workers, farm size, farm income, and incentives for succession influence family farm succession. Wiyono et al. (2015) show that factors related to the interests of youth to be farmers are demographics (education level and main activities), ownership of transportation equipment, and perceptions about the current condition of agriculture and regeneration. Pujiriyani et al. (2016) show that land ownership, farming skills, and marital status bind youth to the agricultural sector. In contrast, the factors that encourage young people to get out of the agricultural sector are education and non-agricultural expertise. Cavicchioli et al. (2018) find that male; first-born children are more likely to take over the family horticultural farm.

Moreover, higher population density is depressive for farm succession, and increasing employment levels favor line. Ningsih & Sjaf (2015) show that the factors that make youth involvement low in sustainable agricultural activities are parental socialization and low peer cohesiveness. According to Wiyono et al. (2015) means of transportation is essential for rice farmers. Transportation facilities include roads and vehicles. Youth who have vehicles and access to farm roads are interested in becoming farmers because transportation facilities are critical for farmers to transport input and harvested crops. Anwarudin & Haryanto (2018) highlight the role of desire to develop themselves as the only motivation to promote youth interest in agriculture and the slight importance of farmer-to-farmer extension. The difference between this research and previous research lies in the analysis of the association between parents' desire and child interest, which is still rarely researched. Generally, in rural families, the relationship between children and parents is very close. In addition, children are also taught to obey their parents. A parent's desire is thought to influence children's career choices. As such, parents may have a vital role in farm succession.

Access to land and other natural resources is the primary strategy of the rural population to get out of poverty because agriculture is the main livelihood in rural areas. Thus, land can transform the lives of rural residents (Makate et al., 2019). The land owned by the respondent's parents determines how much yield is obtained, thus determining the parent's income. If children see that their parents' income is high, then they will feel that being a farmer is quite promising for their future. Conversely, if the parents' land is small, their income is also tiny, then the child will be motivated to find work outside agriculture. Research conducted by Wiyono et al. (2015), Pujiriyani et al. (2016), and Foguesatto et al. (2020) find that parents' landholding is positively associated with the interest in becoming farmers. Based on the above arguments, it is hypothesized that parents' landholding is positively associated with youth interest in becoming farmers.

Wiyono et al. (2015) find that youth completing a higher level of education and currently making agriculture their field of work claimed not to choose agriculture as their primary occupation. With higher education, the younger generation prefers to work in a company or work in the city to earn a higher income, as Pujiriyani et al. (2016) find. Apart from the fact that education is imperative to transform subsistence into market-oriented farming, the literature has well documented the negative association with the desirability of agriculture. Furthermore, the cost of long-term education and the missed opportunity to build assets make later entry into farming even more difficult. Based on the description, it is hypothesized that education is negatively associated with the youth's interest in becoming farmers.

Limited market access is the biggest obstacle to rural development in developing countries (Gramzow et al., 2018). The availability and quality of roads and transportation facilities are essential for transporting agricultural inputs and distributing output. Wiyono et al. (2015) find that youth who have vehicles and access farm roads are interested in becoming farmers. His respondents in Karawang state that transporting agricultural inputs and crops will be more accessible with the ownership of motor vehicles. A similar argument is hypothesized that ownership of motorized vehicles is positively associated with youth interest in becoming farmers.

The role of the family support, such as the desire of parents that children will be farmers, can also influence the younger generation's interest in becoming farmers. Based on their research, Pujiriyani et al. (2016) conclude that interaction in the family plays a vital role in eliciting imagination about a farmer's desire. The reluctance of youth to return to agriculture is not solely their desire. Instead, it is related to the hopes of their parents, who do not want their children to work as farmers. Parents are happier if their young children have other job alternatives. Conversely, parents fear that their children would not be successful in off-farm livelihood and would be encouraging their children to stay in agriculture (Wiyono et al., 2015).

RESEARCH METHODS

The study was conducted in Tubokarto Village, Pracimantoro District, Wonogiri Regency. The study site is selected because most of its population works as rice farmers. The majority of farmers are elderly, and there are a limited number of young people involved in rice farming. Data were collected on 12-20 September 2018, starting from the initial observation, approaching the local community, selecting respondents, and collecting data. The population in this study consists of farmers who had boys aged 15 to 25 years. The reason for choosing males from farm households is that, based on the finding of Wiyono et al. (2015) male respondents prefer to be farmers over women.

Accordingly, Stoneman & Jinnah (2017) argue that culturally agriculture is a male-dominated occupation. Cavicchioli et al. (2018) also find that males are more likely to take over the family horticultural farm.

The study employed cluster sampling. Tubokarto Village consists of 9 hamlets with 19 RWs and 31 RTs. In determining the sample, 2 RTs were randomly selected. Based on the explanation above, the RT chosen by the researcher to be sampled was RT 01 RW 01, Hamlet of Salak, with 18 farmer households. Another sample selected by the researcher was RT 03 RW 02, Hamlet of Sladi, with 26 farm households. All homes in both RTs are included in the sample. The total respondents in this study were 44 boys aged 15-24 years old. The United Nations defines youth as between 15 and 24 years old.

The questionnaire addressed the respondents' profile, parents' landholding, education, ownership of the motorized vehicle, interest of the child to be a farmer, and the desire of parents that their children will be farmers. The dependent variable (Y) is children's interest in becoming farmers. The welfare of children to become farmers is measured by four statements that have a score of 1 (strongly disagree) - 5 (strongly agree). 4 statements must be answered by respondents, namely: 1) I aspire to be a farmer, 2) I like farming activities, 3) I want to work in the agricultural sector, and 4) I want to continue family farming. The independent variable consists of parents' landholding (X_1), education (X_2), ownership of motorized vehicles (X_3), and parents' wishes (X_4). The selection of the first three independent variables is based on the previous research.

In contrast, adding the last independent variable is based on the authors' choice based on the village culture where ties among family members are vital. Parents' landholding is measured in square meters. Education is measured by the number of years respondents spend pursuing formal education. The number of vehicle units measures ownership of motorized vehicles. The desire of parents for children to become farmers (X_4) was measured using a Likert scale using a score of 1 (strongly disagree) - 5 (strongly agree). There are four statements to assess this variable, namely: 1) I aspire for my child to become a farmer, 2) I want my child to like farming activities, 3) I want my child to work in agriculture, and 4) I hope my child continue the family farming business.

The interest of children to be farmers and parents' desire for their children to become farmers are tested in the neighboring hamlet for validity using product-moment correlation. They are tested for reliability using Cronbach's alpha coefficient. Data were then analyzed using multiple linear regression analysis with the following model:

$$I = \alpha + \beta_1 \text{LAND} + \beta_2 \text{EDU} + \beta_3 \text{MV} + \beta_4 \text{PD} + \mu$$

where:

I	: Interest to become a farmer
α	: Constant
$\beta_1 - \beta_4$: Regression coefficients
LAND	: Parents' landholding
EDU	: Education
MV	: Ownership of motorized vehicles
PD	: Parents desire for children to become farmers
μ	: Error term

Because each variable in the research model has different units, multiple log model is used in the form of natural logarithms:

$$\text{Ln}I = \alpha + \beta_1 \text{Ln} \text{LAND} + \beta_2 \text{Ln} \text{EDU} + \beta_3 \text{Ln} \text{MV} + \beta_4 \text{Ln} \text{PD} + \mu$$

To overcome the constraints of statistical normality tests, the ordinal data were transformed into interval data, especially on primary data. According to Riduwan and Kuncoro (2012), the transformation of ordinal into interval data aims to make data usually distributed or homogeneous, which can then be tested using the classic assumption of the transformed data. The data transformation method used is the Successive Interval Method (MSI). Data transformation was carried out for two variables, namely the interest of children to become farmers and parents' desire to become farmers. The classic assumption test consists of normality, heteroscedasticity, and multicollinearity. Normality was tested using Jarque Berra, heteroscedasticity with Glejser test, and multicollinearity by examining the correlation between independent variables. Afterward, an F test and t-test were performed.

RESULT AND DISCUSSION

Research Location

Wonogiri is one of the agriculture-based regencies in Central Java with an enormous potential for agricultural land. The agricultural sector in Wonogiri Regency has a significant contribution to rice production. In 2015, with 424,528 tons of rice production, Wonogiri was ranked 11th out of 29 districts in Central Java Province. In addition, in terms of labor, most of the population (55 percent) in the Wonogiri district are farmers. The agricultural sector remains the leading choice for investment in rural areas for three reasons: 1) the risk is relatively low, 2) the sector absorbs a large number of workers without minimum educational requirements, and 3) the sector is passed on from generation to generation (Chamidah, 2015).

One of the sub-districts in the Wonogiri Regency that has potential in the agricultural sector is Pracimantoro. Pracimantoro is a sub-district that covers an area of 12,035.87 hectares, with paddy fields of 864.73 hectares or 60.8 percent of the total land in Pracimantoro (BPS, 2017). Rice production in Pracimantoro in 2016 was 8,772 tons and was one of the highest in Wonogiri Regency (BPS 2017). Tubokarto is located in the Pracimantoro district with good rice farming potential. In 2017, Tubokarto had the highest average productivity among other villages in the Pracimantoro district, with average productivity of 6.24 tons/ha. Based on the village dynamic data potential report in February 2018, Tubokarto has 3,708 people with 1,250 households, and the majority of the population is working as farmers. There are 1,062 farmers and 944 agricultural laborers. This illustrates that the agricultural sector is still the cornerstone of the people's economy in Tubokarto. Tubokarto is also one of the villages that have experienced a crisis of young workers in the agricultural sector. Many young people seem reluctant to engage in farming. They are rarely willing to continue their parents' farming. They prefer to migrate to urban areas to work in manufacturing factories.

Tubokarto is a village in the Pracimantoro district with good rice farming potential. In 2017, Tubokarto showed the highest rice productivity among other villages in the Pracimantoro district (6.24 tons/ha), although it is not the highest in harvested area and production. Based on the report of dynamic village potential for February 2018, Tubokarto has 3,708 people with 1,250 household heads with a majority working as farmers. There are 1,062 farmers and 944 farm laborers. This illustrates that agriculture is still the most dominant sector of the economy of Tubokarto. Tubokarto has been experiencing a youth crisis in the farming sector. Almost 70 percent of farmers in Tubokarto Village are old-aged farmers who only completed elementary and junior high school. Many young people

aged 15-25 years are reluctant to engage in farming. They prefer to migrate to urban areas to work in manufacturing factories.

Respondents' Profile

This section describes the profile of respondents based on age and education and the description of research variables consisting of parents' landholding, ownership of motorized vehicles, the respondent's interest in becoming farmers, and the desire of parents for their children to become farmers.

Table 1. Respondents' Profile

No	Age (years)	Freq	Share (%)
1	15-20	29	65.90
2	21-24	15	34.10
Total		44	100.00

No	Education	Freq	Share (%)
1	Elementary school	2	4.54
2	Junior high school	3	6.83
3	Senior high school	39	88.63
Total		44	100.00

No	Landholding (m2)	Freq	Share (%)
1	1228 – 2292	11	25.00
2	2293 – 4585	23	52.28
3	4586 – 6878	8	18.18
4	≥ 6879	2	4.54
Total		44	100.00

No	Ownership of motor vehicles	Freq	Share (%)
1	1 – 2	24	53.06
2	3 – 4	10	26.22
3	5 – 6	4	8.09
4	7 – 8	4	8.09
5	≥ 9	2	4.54
Total		44	100.00

Table 1 shows more respondents at 15-20 years old, and most respondents completed senior high school. Land ownership is small, mostly less than 0.5 ha. Most farm households possess two motor vehicles: one for transporting farm input and produce and another as a transportation mode to school because the distance to school is quite far. The distribution of responses of the interest of children to become farmers is presented in Table 2.

Table 2. Distribution of Responses on the Interest of Children to Become Farmers

State-ment	Totally disagree	Disagree	Neutral	Agree	Totally agree	Total
1	0	22	18	3	1	44
2	0	0	16	27	1	44
3	0	19	17	7	1	44
4	0	6	22	15	1	44
Total	0	47	73	52	4	176
%	0	26.70	41.48	29.55	2.27	100

Based on Table 2, most respondents answered neutrally. Those who answer agree are slightly higher than those who disagree. The same distribution pattern is also shown in Table 3, which presents the distribution of respondents' answers to the parents' desire that their children become farmers. Because most respondents give neutral responses, they are not optimistic about farming as their future livelihood. This supports the findings of Tadele & Gella (2012), who reveal that very few young people and their parents consider farming as a possible option for future livelihoods.

Table 3. Distribution of Responses on Parents' Desire that Their Children Become Farmers

State-ment	Totally disagree	Disagree	Neutral	Agree	Totally agree	Total
1	1	9	29	5	0	44
2	0	0	10	28	6	44
3	0	11	18	12	3	44
4	0	2	22	15	5	44
Total	1	22	79	60	14	176
%	0.56	12.50	44.89	34.09	7.95	100

Based on the validity testing of the research instruments for children's interests and parents' wishes, all items are valid because r statistic $>$ r table. The reliability test based on Cronbach's alpha coefficient for the instrument of measuring the desire of parents and the interest of children is higher than 0.7, meaning that the instrument has a relatively high level of reliability.

Results of Model Estimation

Table 4. Estimation Results of Multiple Linear Regression Analysis

No	Variables	Coefficient	t statistic	Prob.
1	Constant	-1.038	-0.569	0.572
2	Parent's landholding	0.484	2.515	0.016
3	Education	-0.174	-2.857	0.007
4	Ownership of motor vehicles	-0.029	-0.890	0.379
5	Parent's desire	0.419	3.191	0.003

t table: 2.015

Based on Table 4, the following estimation result is obtained:

$$\hat{Y} = -1.038 + 0.484 \text{ LAND} - 0.174 \text{ EDU} - 0.029 \text{ MV} + 0.419 \text{ PD}$$

The classical testing assumptions show that the data are normally distributed, free of symptoms of multicollinearity and heteroscedasticity. From the test results, the F value is 17.715 with p-value $0.000 < 0.05$, and F statistic = $17.775 > F$ table = 2.58. The adjusted R^2 in this study is 0.609. This indicates that the independent variables included in the model can explain the 60.9 percent variation of the dependent variable. The rest of 39.1 percent is explained by other variables not included in the model.

Parents' landholding has a significant positive effect on children's interest in becoming farmers. This is consistent with the findings of Wiyono et al. (2015), Pujiriyani et al. (2016), and Foguesatto et al. (2020). Access to land and other natural resources is the primary strategy of the rural population to get out of poverty because agriculture is the main livelihood in rural areas. Thus, land can transform the lives of rural residents (Makate et al., 2019). The land owned by the respondent's parents determines how much yield is obtained, thus determining the parent's income. If children see that their parents' income is high, then they will feel that being a farmer is quite promising for their

future. Conversely, if the parents' land is small, their income is also tiny, then the child will be motivated to find work outside agriculture. As the findings of Prayoga et al., (2020) which state that young people in rural areas will only want to become farmers if they cultivate horticultural or floriculture commodities that do not require large land.

Education has a significant negative effect on children's interest in becoming farmers. The results of this study support the findings of Wiyono et al. (2015). Young people with higher education choose to work in the city to achieve higher income. With higher education, the younger generation prefers to work in a company or work in the city to earn a higher income. Apart from the fact that education is imperative to transform subsistence into market-oriented farming, the literature has well documented the negative association with the desirability of agriculture. Furthermore, the cost of long-term education and the missed opportunity to build assets make later entry into farming even more difficult.

Based on the study results, it can be seen that the ownership of motorized vehicles has no significant effect on the interest of children to become farmers. This finding is different from the research conducted by Wiyono et al. (2015), who found that youth who own vehicles and can access farm roads were interested in becoming farmers. Respondents in the village reported that motorized vehicles facilitate mobility to find non-farm jobs in urban areas.

Parents' desire that their children become farmers has a significant positive effect on children's interest in being farmers. However, Table 3 shows that parents are not supportive of their children becoming farmers because most parents give neutral responses. Based on the interview, most farmers perceive that off-farm income is higher than on-farm income. This result is also by the research conducted by Ningsih & Sjaf (2015), Pujiriyani et al. (2016), and Prayoga et al. (2020), who find that socialization within the household plays a vital role in generating imagination about aspirations to work as farmers. Morais et al. (2017) recommended that parents motivate their successors to pursue agricultural education because they will be more likely to learn to manage farms and increase their desire to continue on family farms.

CONCLUSION AND SUGGESTION

This research finds that parents' landholding has a significant positive effect, education has a significant negative impact, ownership of motorized vehicles has an insignificant effect, and the desire of parents for their children to become farmers has a significant positive impact on the interest of rural youth become farmers. The land is the main asset for farmers. More extensive landholding means more capital available for farming and a higher potential to earn a higher income. Because education negatively affects children's interest in becoming farmers, it is recommended that schools and related parties provide information on the importance of the agricultural sector and the promising career in agriculture when it is well managed and catches up with the current technological progress. This could be done by inviting successful farmers to school to share their experiences and visiting successful farms to get the insight that agricultural livelihood is a viable choice for their future. The desire of parents to become a farmer has a positive effect on the interest of rural youth to become farmers. This shows how socialization about the importance of agriculture for the economy by the family needs to be improved, mainly to prevent a food crisis. When farmers can provide a promising image of agriculture to their children, they can motivate them to engage in this sector.

This paper contributes to the existing literature by examining the impact of parental desires on children's interests. Thus, to retain young people in the agricultural sector, it is not only young people who need to be motivated but also parents. Cooperation between parents and children in agricultural activities is expected to smooth the process of rural regeneration in rural areas. It is hoped that in the future young people with higher education will be able to transform traditional agriculture into more modern, market-oriented while at the same time adopting sustainable agriculture.

This research was conducted to analyze the determinants of the interest of the youth in one village to become farmers. Therefore, it has the limitation that it may not explain the younger generation's interest in different geographical conditions. Therefore, further research is recommended to carry on a broader study by comparing the younger generation's interests in working as farmers in several regions with different geographical conditions. It is also recommended to ask children how far they have been involved in their parents' farms because this may affect their interest in farming. In addition, because many crops lead to different yields, it is also interesting to compare farm regeneration between other crops.

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