



Engaging Rural Youth: The Role of Young People in Integrated Farming Development in Nglanggeran, Gunungkidul Regency

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ABSTRACT

Integrated farming is a farming system with integration patterns in cultivation, livestock, and fisheries. Rural youth has a potential role to the development of integrated farming. This study aims to examine the role of youth and its effect to integrated farming development in Nglanggeran, Gunungkidul Regency. This research is a quantitative descriptive study. The total number of respondents in this study is 36 farmers selected with quota sampling. Data collection techniques are observation, documentation, literature review, and in-depth interview. The data analysis uses the proportion test and the multiple linear regression test. The results show that more than 50% of the farmers said that youth played a major role in integrated farming activities. The average level of youth role is 64.33%. Moreover, the role of youth as an agent of change plays a significant role in integrated farming development in Nglanggeran. The influence of an agent of change is positive, which means that the higher the level of the agent of change, the greater the development of the integrated farming. However, the role of youth as an agent of development and an agent of modernization has no significant impact on integrated farming development in Nglanggeran. We conclude that the development of integrated farming in Nglanggeran could increase by engaging the rural youth since they have an important role as an agent of change, an agent of development, and an agent of modernization. Intensive training and visits to successful cocoa farmers communities to exchange knowledge can help strengthen rural youth role in integrated farming development.

INTRODUCTION

Nglanggeran village is one of central cocoa plantations in Yogyakarta. The area of the cocoa plantation is around 101 hectares. High altitude and its topography support the growth of cocoa. Farmers in Nglanggeran have practiced integrated farming system between cocoa and etawah goat. Warintan et al. (2020) defined integrated farming system as agricultural activities with in-tegration pattern in cultivation, livestock, and fisheries in the same area. This cocoa-etawah integration in Nglanggeran was first initiated by the Agricultural Technology Park Nglanggeran, under the supervision of the Department of Agriculture of Gunungkidul. The integration uses the livestock manure as fertilizer for cocoa plants, while the cocoa leaves and shells are used as goat feed. Integrated farming is beneficial for farmers. The implementation of integrated farming increases the opportunity for farmers to earn more income. As stated by Sheikh et al. (2021), farmer's net income in integrated farming system was increased as compared to the traditional farming method. Moreover, the result of the study by Ponnusamy & Devi (2017) shows that combination of farming enterprises, including goat +horticulture system, are contribute to higher net income to farmers. An example of the implementation of integrated farming is agricultural activities by farmers in Tidu Village, Bukateja District, Purbalingga Regency. They integrate rice

cultivation with chicken, cattle, goat, and catfish farming (Pujiyatno & Miftahuddin, 2017). Farmers use manure and organic fertilizer for their crops. They also cultivate catfish around the rice fields. In Nglanggeran, farmers also use goat manure as fertilizer for cocoa plants. Farmers believe that using manure is good for the cocoa growth. It is in line with the research of Innaya et al. (2023) that goat manure application in cocoa plant increases the root length due to the availability of complete nutrients in goat manure.

The implementation of cocoa-etawah integration in Nglanggeran is inseparable from the involvement of young generation. The productive population aged between 15 to 64 years old is 1,841 in Nglanggeran village (BPS, 2021). It indicates that youth is a potential asset for agricultural development. According to Ritonga et al. (2015), youth have an essential role as an agent of change and social control in the community, so they are expected to drive social changes, including in agricultural development. Youth are one of valuable assets for many nations. In development aspect, youth have important roles to support and boost the development. We use three classifications of the role of youth adapted from Abdullah (2018): agent of change, agent of development, and agent of modernization.

Youth as an agent of change could drive better changes in the community. For example, they can provide solution to problems faced

by the society. As stated by Iwasaki (2016), youth engagement has the potential to facilitate social change. As an agent of development, youth could help the development process in every aspect, including the agricultural development.

According to Puspasari et al. (2020), young people should have the courage to innovate, encourage community creativity, and support regional development by adapting to the conditions of society. Meanwhile, the role of youth as an agent of modernization is to support the diffusion process of modern innovation in the community. For example, young people can introduce internet technology to the community so that they can use digital marketing rather than the conventional one (Anugrah, 2021). Nurlaela et al. (2022) have shown that young farmers use the internet for expanding market reach, finding important information, communicating with their friends, building networks, and doing transactions.

Youth in Nglanggeran has a good perception of integrated farming system, but the participation is still low (Ummah, 2017). Rural youth in Nglanggeran consider that integrated farming system could lead to better economy and more ecological friendly. Many youth focus more on agrotourism development which are claimed to provide better economic value. According to the result of the study by Maulida et al. (2022), the integration between agrotourism and agriculture in Gunungkidul can make agriculture

more appealing to young generation. However, youth interest to work in agriculture is such a challenge.

Som et al. (2018) have shown that there is decreasing youth participation in agriculture sector for the past few years. Rural youth prefer to work in cities due to employment availability, good education, and better health (Som et al., 2018). There is also a barrier for rural youth to work in agriculture. It was the lack of access to productive assets, especially land, so that rural youth are unable to pursue agriculture (Swarts & Aliber, 2013). It is important that various challenges in agriculture, such as farmer regeneration and agricultural development, need more attention and need to be addressed by many stakeholders, including the youth.

This study has two objectives. First, it examines the role of the youth in the development of integrated farming in Nglanggeran, Gunungkidul Regency. Second, it analyses the influence of the youth's role in the development of integrated farming in Nglanggeran. It is critical to discuss those two aspects since the youth play an important role in agricultural development.

METHODS

This study uses an explanatory research method to explain the position of the variables studied and the correlation between them. The method used in this study is descriptive analysis with quantitative approach. The purpose of a descriptive study is to get an overview of the characteristics of a phenomenon

(Zaluchu, 2021).

This study was conducted in 2022. The research location was at Nglanggeran Village, Patuk District, Gunungkidul Regency. Nglanggeran was chosen as the research location since it is a high cocoa producing region. Moreover, the number of rural youth population in Nglanggeran is around 69% and it has potential to improve the integrated farming in Nglanggeran. The population in this study were 70 farmers who implemented cocoa-goat integration in Nglanggeran and were members of three farmer groups, namely Sido Dadi, Mugo Dadi, and Ngudi Makmur. around 69% and it has potential to improve the integrated farming in Nglanggeran. The population in this study were 70 farmers who implemented cocoa-goat integration in Nglanggeran and were members of three farmer groups, namely Sido Dadi, Mugo Dadi, and Ngudi Makmur.

According to Gay et al. (2009), the minimum sample of small population is 20%. This research employs quota sampling to select informants from each farmers group. We select 36 farmers (50%) from total population. This research used primary and secondary data. The primary data was collected from the interview with respondents, while the secondary data was collected from the stakeholder's publication, such as TTP Nglanggeran, BPS Gunungkidul and the Department of Agriculture Gunungkidul. Data collection techniques include observation, documentation,

literature review, and in-depth interview with the participating farmers in Nglanggeran village.

The data was analyzed using the proportion test and the multiple linear regression test. The proportion test was used to identify the role of the youth in the integrated farming activities in Nglanggeran. The proportion test uses the following formula:

$$Z_{hit} = \frac{\frac{x}{n} - 0,50}{\sqrt{0,50(1-0,50)/n}}$$

where x is number of participating farmers with high and very high rating, n is total number of samples, and 0.05 is population proportion (50%).

The multiple linear regression test is conducted to determine the influence of the role of youth in the development of integrated farming in Nglanggeran. Independent variables used in this research are agent of change, agent of development, and agent of modernization. The regression equation is:

$$Y = A + b_1X_1 + b_2X_2 + b_3X_3 + e$$

where Y is integrated farming development, A is constant value, b_1 , b_2 , b_3 are coefficients, X_1 is agent of change, X_2 is agent of development, X_3 is agent of modernization, and e is error value. The significance level used is 0.05.

The multiple regression in this study is analyzed using IBM SPSS Statistics 25 with backward method. Backward method is one of the linear

Table 1. Farmers Distribution based on the Role of Youth in Integrated Farming Development in Nglanggeran 2022

No	Categories (score)	Number of farmers	Percentages (%)
1	Very low (0-18)	0	0
2	Low (19-36)	3	8
3	Moderate (37-54)	9	25
4	High (55-72)	17	47
5	Very high (73-91)	7	20
Total		36	100

Source: Primary Data Analysis (2022)

regression models that begins with all variables in the model, then they are eliminated one by one if the variable has the highest p-value until a suitable model (only variable that influences the model) is obtained (Permatasari & Ratnasari, 2016). The classical assumption test is also required before running the multiple linear regression test. It consists of normality test, heteroscedasticity test, and multicollinearity test.

RESULTS AND DISCUSSION Integrated Farming in Nglanggeran

Farmers in Nglanggeran Village, Gunungkidul Regency have implemented the integrated farming system of cocoa cultivation and etawah goat farming since 2015 when TTP Nglanggeran introduced this integrated farming program for the first time. In short, the concept is to utilize the cocoa leaves and shells as goat feed, while the goat manure is used as fertilizer for the cocoa trees. Cocoa leaves can be used as feed, while cocoa shells can be processed as mineral block. The farmers believe

that the use of cocoa leaves and shells as green fodder for the etawah goats will make the livestock keeping more efficient. This result is consistent with that of Akhadiarto (2018) which has reported that feeding etawah goats with 1-2 kg of cocoa shells/day could decrease the labor cost for the provision of green fodder up to 50%. It means that cocoa leaves and shells can be used as alternative feed for goats if farmers do not have time to prepare green fodder.

The Role of Youth in Integrated Farming Development

The role of youth in this research is defined as an agent of change, an agent of development, and an agent of modernization. The role of youth is classified into five categories: very low (scores of 0-18), low (scores of 19-36), moderate (scores of 37-54), high (scores of 55-72), and very high (scores of 73-91). The distribution of the roles of the youth in the integrated farming development in Nglanggeran can be seen in Table 1.

Based on Table 1, 47% of farmers assume that youth have high

category of role and 20% assume that youth have very high role in the development of integrated farming in Nglanggeran. The high category of rural youth role in Nglanggeran include several indicators, those are encourages farmers to join extension activities, use manure for cocoa trees, and maintain goat pen cleanliness. Meanwhile, the very high category include the role of rural youth in land preparation and manure management.

The proportion test was then carried out to assess the data. The

result of the proportion test shows that the calculated Z is 2.048, higher than Z table which is 1.645 for alpha 5%. Thus, more than 50% of the farmers assume that youth have a high role in the integrated farming development in Nglanggeran. This result matches that observed in Abdullah (2018) which has found that the role of youth in the agricultural development in Gayo Lues Regency, Aceh Province is positive. Young people could support the development of integrated farming on four aspects; they are organizational aspect, the

Table 2. The Role of Youth in Integrated Farming Development in Nglanggeran

Indicators	Interval Score	Average Score	Role Rates	Categories
A. Agent of Change				
Participate in cocoa training	0-3	2.28	76	High
Participate in cocoa land preparation	0-5	4.14	83	Very High
Participate in cocoa seeding	0-5	4.06	81	Very High
Participate in cocoa treatment	0-3	2.17	72	High
Participate in cocoa harvesting	0-5	3.97	79	High
Participate in making goat pen	0-5	4.11	82	Very High
Participate in goat cattle training	0-3	1.92	64	High
Participate in manure management	0-5	4.19	84	Very High
Total (A)	0-34	26.83		
Average (A)			78	High
B. Agent of Development				
Encourage to increase cocoa productivity	0-4	2.03	51	Moderate
Encourage to use manure for cocoa tree	0-3	2.03	68	High
Encourage to solve the problems together	0-6	2.08	35	Low
Encourage to increase cocoa bean quality	0-4	2.28	57	Moderate
Seeking for cocoa assistance program	0-4	2.56	64	High
Maintain goat pen cleanliness	0-3	2.31	77	High
Seeking for cattle assistance program	0-3	1.78	59	Moderate
Total (B)	0-27	15.06		
Average (B)			59	Moderate

C. Agent of Modernization				
Encourage to not using pesticide	0-3	1.72	57	Moderate
Encourage to implement integrated pest management	0-3	1.61	54	Moderate
Encourage to use technology to increase cocoa productivity	0-3	1.67	56	Moderate
Encourage to use digital marketing	0-3	2.03	68	High
Encourage to join cooperation group	0-4	1.83	46	Moderate
Encourage to use green fodder from cocoa leaf	0-3	2.03	68	High
Encourage to do sustainable livestock	0-3	1.72	57	Moderate
Encourage to use technology to increase goat milk production	0-4	2.00	50	Moderate
Encourage to actively join farmer group	0-4	2.06	51	Moderate
Total (C)	0-30	16.67		
Average (C)			56	Moderate
Average (A+B+C)			64.3 3	Moderate

Source: Primary Data Analysis (2022)

use of technology, established economy, and environment friendly.

The Role of Youth as an Agent of Change

Based on Table 2, the average level of the role of youth as an agent of change is 78%, which is classified into the high category. The highest score can be seen in the indicator of the role of youth in processing of livestock waste with 84%, which is in the very high category. Meanwhile, the lowest score is 64% in the indicator of youth participation in the training of goat farming.

The role of the youth as an agent of change can be seen from several indicators. First, they actively participate in the cocoa training program, since their parents sometimes could not attend it. Second, they actively help farmers to prepare the land before the plantation of cocoa tree. Many of their peers join this activity. This is in

accordance with Ningsih & Syaf (2015) who have shown that peer cohesiveness is one of the factors that influences the role of the youth.

Third, they actively help farmers in seeding the cocoa. Young people in this village have applied for cocoa seeds grants from the government and private sectors. Fourth, they usually help farmers to maintain cocoa trees productivity, e.g. pruning branches, nourishing cocoa trees, and controlling the pest. Fifth, they actively help farmers to harvest the cocoa. Some of these young people also work in the cocoa processing business, such as Griya Coklat and TTP Nglanggeran. Furthermore, the role of the youth as an agent of change is supported by good perception of integrated farming. As stated by Ummah (2017), young people in Nglanggeran have a good perception of cocoa-goat integration.

The Role of Youth as an Agent of Development

Based on Table 2, the average level of the role of the youth as an agent of development is 59% (moderate category). The highest score, at 77% (high category), can be seen in the indicator in which the youth encourage farmers to clean the goat pens to maintain the goat's health. Meanwhile, the lowest score is 35% (low category) in the indicator where the youth encourage farmers to solve problems related to cocoa cultivation.

The role of the youth as an agent of development has some indicators. First, they encourage farmers to use manure as fertilizer for cocoa trees. Most of these youth have actively helped their parents to process the manure. Second, they actively encourage farmers to maintain goat pens cleanliness. They help their parents to clean the goat pen every week and also collect the goat's feces as a material for making manure.

Third, they actively seek cocoa training programs, either from the government or private agents. The role of the youth in this process is making proposal, collecting data of the cocoa trees and etawah goats, and handling the administration of farmer groups. Fourth, they also actively seek etawah goats programs, especially from the government. Some of them have even raised their own goats. It is very interesting since etawah goats rearings are profitable. Therefore, the awareness of the youth to develop integrated farming

in Nglanggeran has emerged.

The Role of Youth as an Agent of Modernization

Based on Table 2, the average rate of an agent of modernization is 56%, which is classified into moderate category. The highest score can be seen in the indicator where the youth encourage farmers to use leaves and cocoa pods as goat feed, while the lowest one joins the cooperation group.

The role of the youth as an agent of modernization can be seen in two major indicators. First, they encourage farmers to use digital marketing to sell cocoa products and etawah milk. They offer training about digital marketing and how to use them as a tool to increase sales. Some of these young people who work in Griya Coklat and TTP Nglanggeran use social media and marketplace to sell cocoa products and etawah milk. Second, they encourage farmers to use cocoa leaves as green fodder for etawah goats. They also help farmers to collect green fodder in the field, because some of their parents are too old to collect green fodder by themselves. This is in line with the result of a study by Bullock and Crane (2021) who have suggested that fodder production and conservation are great areas of interest for young people.

Integrated Farming Development

Table 3 displays the rates of integrated farming development in Nglanggeran. There are 5 aspects to identify the condition of integrated

Table 3. Integrated Farming Development Rates in Nglanggeran

Indicators	Interval Score	Average Score	Rates (%)	Categories
Functional diversity	0-20	18.47	92	Very High
Sustainable agroecosystem	0-9	7.56	85	Very High
Optimization of inputs and resources	0-23	19.56	86	Very High
Support of technology, knowledge, capital, human resources	0-17	14.75	87	Very High
Combination suitability of plant, animal, and inputs	0-18	15.19	85	Very High
Total	0-87	75.53		Very High
Average			85	High

Source: Primary Data Analysis (2022)

farming development: functional diversity, sustainable agroecosystem, optimization of inputs and resources, support of technology, knowledge, capital, human resources, and a combination of suitability of plants, animals, and inputs.

The average level of integrated farming development in Nglanggeran is 87% (very high category). The highest rate is found in the functional diversity aspect. There are some

indicators of functional diversity. First, farmers have implemented the integration of cocoa trees and etawah goats. Second, cocoa leaves have been used for green fodder to feed the etawah goats. Third, goat's feces have been used to fertilize cocoa trees. Fourth, cocoa cultivation and the etawah goats livestock are mutually beneficial. The last indicator is the cocoa-goat integration has increased cocoa productivity.

Table 4. Output of Regression Analysis Model 1 with Backward Method

Variables	Regression Coefficients	Calculated t	Sig.	Annot.
Agent of change (X1)	0.534	1.447	0.158	NS
Agent of development (X2)	-0.038	-0.058	0.954	NS
Agent of modernization (X3)	0.292	0.573	0.571	NS
Constant	56.905			
R square	0.182			
Adjusted R square	0.105			
F calculated	2.367			

Annotation:
 S : Significant on $\alpha = 0.05$
 NS : Non Significant on $\alpha = 0.05$

Source: Primary Data Analysis (2022)

The Influence of the Role of Youth in Integrated Farming Development

The second purpose of this research is to determine the influence of the role of the youth in the integrated farming development in Nglanggeran. Table 4. shows the result of Model 1 of the regression analysis with backward method. In Table 4, the variables of Agent of Change (X1), Agent of Development (X2), and Agent of Modernization (X3) are not significant because the Significant value (Sig.) is more than alpha (0.05). The regression analysis continues until a suitable model is obtained, which is Model 3. The result of the regression analysis of Model 3 is in Table 5.

Based on Table 5, the independent variable that influences the integrated farming development is the role of the youth as the agent of change (X1), whereas the variables of the agent of development (X2) and the agent of modernization (X3) are not significant. The adjusted R square

value (0.131) shows that the effect of the role of the youth as an agent of change is about 13.1%. It means that 13.1% of the integrated farming development is influenced by the role of the youth as an agent of change, while the other 86.9% is influenced by other factors that are not examined in this study.

The role of the youth as an agent of change could affect the development of integrated farming based on several high indicators, e.g. young people actively participate in land preparation for cocoa cultivation and cocoa seeding, constructing goat pens, and livestock waste management. The perception of young people of integrated farming in Nglanggeran is positive (Ummah, 2017). It has a correlation to the role of the youth, as stated by Ritonga et al. (2015) that youth’s perception of sustainable farming development in Labuhanbatu Utara is positive and the role of youth in farming development is also positive.

On the other hand, the role of

Table 5. Output of Regression Analysis Model 3 with Backward Method

Variables	Regression Coefficients	Calculated t	Sig.	Annot.
Agent of change (X1)	0.741	2.505	0.017	S
Constant	55.632			
R square	0.156			
Adjusted R square	0.131			
F calculated	6.274			

Annotation:

S : Significant on $\alpha = 0.05$

NS : Non Significant on $\alpha = 0.05$

Source: Primary Data Analysis (2022)

youth as an agent of development and an agent of modernization are not significant for integrated farming development in Nglanggeran. There are several reasons why the role of the youth as an agent of development and an agent of modernization is still low.

Based on the answers the respondents provided in the interview, it is difficult for the youth to help farmers solve their problems, due to the young people's limited knowledge and skills in cocoa cultivation. The implication is that the young generation may not have adequate motivation to develop integrated farming in Nglanggeran.

Only a few young people choose to work in the agriculture sector. Many of them prefer to work outside this field, such as working as public servants, police officers, teachers, factory workers, and private sector employees, which offer stable income every month. Nazaruddin and Anwarudin (2019) finds that young generation prefer to work as industrial workers rather than working in agriculture since the income of industrial workers is more stable. Another study also supports the reason why young people are not interested in working as farmers. The results of the study by Hidayah et al. (2020) show that there is a gap between senior farmers and young farmers. Senior farmers are less likely to trust young farmers to make the right decision in the production stage. They believe that young farmers do not have sufficient knowledge of cultivation techniques.

This low motivation of the young generation to work in agriculture may lead to the lack of technological innovation in agricultural development in Nglanggeran. Thus, low rates of an agent of development may affect the role of youth as an agent of modernization. This result reflects that of Ritonga et al. (2015) who have also found that the highest coefficient of the role of youth is in the agent of change, followed by the agent of development, and the lowest coefficient is in the agent of modernization.

It is important to plan the strategy to develop the integrated farming in Nglanggeran. This strategy could contribute to food security. Considering the current condition in Nglanggeran, the possible strategy is to create millennial farmers community or better known as *Komunitas Petani Milenial*. This community will be the place where young people gather and learn together about agriculture and rural development. They can share knowledge with each to improve their skills and capacity. Previous study found that community has an important role in positive social change. As stated by Yvonne (2004), the local community can promote the participation of youth in the society. There are several benefits from this community, such as improving responsibility, contributing to community development, and developing valuable knowledge and skills.

CONCLUSION AND SUGGESTION

Based on the results of the study, more than 50% of farmers

said that youth had a high role in the development of integrated farming in Nglanggeran. The average level of youth role was 64,33%. The role of the youth that had significant impact on the integrated farming development in Nglanggeran was the role of the youth as an agent of change. The influence of an agent of change was positive, meaning that the higher the level of the agent of change, the greater the development of the integrated farming. On the otherhand, the role of the youth as an agent of development and an agent of modernization did not show a significance to the development of integrated farming in Nglanggeran.

The obstacles faced by rural youth in the development of integrated farming is the lack of knowledge of etawah goat farming and cocoa cultivation. It is expected that farmers group and the Department of Animal Husbandry Gunungkidul assists rural youth and give them intensive training about etawah goat farming. The rural youth is expected to visits to succesful cocoa farmers communities to exchange knowledge so that they will get more knowledge about cocoa cultivation.

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