AGRARIS: *Journal of Agribusiness and Rural Development Research*

Vol. 11 No. 2 July - December 2025, Pages: 215-233

RESEARCH ARTICLE

Article history:
Submitted: June 14th, 2024
Revised : June 13th, 2025
Accepted : December 20th, 2025

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Strengthening Agricultural Regeneration: Determinants of Young Farmers' Performance in Sub-Urban Villages

DOI: https://doi.org/10.18196/agraris.v11i2.503

ABSTRACT

Farmer regeneration in Indonesia is faced with severe challenges, and it is predicted that this may lead to a decrease in the national food production ability. Therefore, strategic effort is required to facilitate the regeneration process. In this study, we aimed to analyze the dynamics of farmer regeneration in sub-urban villages and the determinants of the farming performance of a young farmer. The research method employed a mixed approach between qualitative and quantitative perspectives. In the quantitative method, we purposively selected 51 young farmers as samples for interview. The qualitative approach was used to explain the dynamics of regeneration behavior, whereas the quantitative approach based on Spearman correlation was used to analyze a few critical variables, which exhibited a strong correlation with a young farmer farming performance. The research results revealed a dynamic behavior of a farmer child, determining their entry into or exit from agriculture, and that farming income was the main determinant of decision-making in entering the agriculture sector. The analysis further revealed that a young farmer farming performance correlated significantly with their agricultural entrepreneurship orientation, which covers the feeling of confidence, patience, and perseverance in farming. Further, their farming performance was also correlated significantly with access to external finance and agricultural education in the family. These results provide valuable insights regarding the importance of the empowerment strategy, particularly at farmer household level, in encouraging effective farmer regeneration.

Keywords: Agripreneurial orientation; Family farming; Farmer regeneration; Young farmer farming performance

INTRODUCTION

The continuous decline in young farmers is gaining national attention, as this poses serious threat to the sustainability of agricultural production, particularly in terms of food sovereignty and national self-sufficiency (Wittman, 2023). According to the 2023 Agricultural Census, the percentage of farmers aged 19–39 years has declined to approximately 22% (BPS-Statistics Indonesia, 2023). The Food and Agriculture Organization (FAO) of the United Nations recognizes this as a threat to agricultural productivity and production. It is also

gaining concern as it continues to diminish small family farms, currently employing 93% of all farmers (Food and Agriculture Organization [FAO], 2018).

Nevertheless, the aging farming population and challenges in generational renewal are global issues (Conway, McDonagh, Farrell, & Kinsella, 2016; Duesberg, Bogue, & Renwick, 2017; Lobley, Baker, & Whitehead, 2010). The declining interest of the younger generation in agricultural careers contributes directly to the low rate of farmer regeneration (Sumberg, Yeboah, Flynn, & Anyidoho, 2017). However, the specific causes and impacts vary across different countries. In developed countries, a low succession rate can be caused by the absence of a successor (Duesberg et al., 2017) or the hesitance of old farmers to retire immediately and hand over the family agriculture management to their successor (Conway et al., 2016). However, in developing countries such as Indonesia, the factors causing a low succession rate differ from those in developed countries and include the impact of narrow land ownership, a weak supply of agricultural input, poor infrastructure, less financial support, and obstacles in the production-based marketing (Sugandini, Effendi, Sugiarto, Kundarto, & Kawuryan, 2023). These are made worse by the strong impact of city culture, which then shapes a negative perception of the agriculture sector. For instance, a large proportion of the young generation sees the agriculture sector as a dirty and low-prestige occupation with no prestige, which cannot ensure a prosperous future (Özçatalbaş & Imran, 2020).

Rasau Jaya, West Kalimantan Province, an ex-transmigration village located in the suburban area of Pontianak City, offers a perfect scenario for the investigation of the regeneration obstacle and young farmer farming performance. Owing to its geographical location as this sub-urban area, then the young generation's point of view about the agricultural sector is strongly influenced by the city culture covering them (Girdziute et al., 2022). Therefore, over the last two decades, the ability of food production in this area, particularly in terms of vegetable horticulture, has declined continuously. However, earlier, this village represented the most essential vegetable production area in West Kalimantan. This phenomenon is similar in many places, as also reported by Dokubo, Sennuga, Omolayo, Bankole, and Barnabas (2023).

The decline in vegetable production has been caused by a continuous decrease in the number of young farmers as many migrate from villages in search of non-agriculture employment (Dokubo et al., 2023; Malamassam, 2016). Consequently, the uncultivated agricultural land is sold to people from the city or converted to a palm oil plantation. This land conversion phenomenon worsens the situation because, in certain conditions, vegetable cultivation cannot be performed side by side with palm oil plantations. For instance, palm oil plants shade the vegetable plants and prevent sunlight from reaching them, in addition to an increased incidence of rat pests in palm oil plantations. The shift of land usage to independent palm oil plantations can be viewed as a form of leaving agriculture because palm oil plantations do not require intensive care as vegetable farming or other food plant cultivation. It is reported that the continuous shift in land use from food crop cultivation to palm oil plantations has increased in line with the massive development of palm oil plantations in

West Kalimantan. This ongoing transition is expected to cause food insecurity (Sudrajat, Suyatno, & Oktoriana, 2021).

Considering the existing obstacles, it is a tremendous challenge for the government to encourage regeneration. The efforts that have been made include improving infrastructure in the village and providing financial incentives with the final target of income increase (Haryanto, Wardana, Jamil, Brintanti, & Ibrahim, 2023; Irawan, Hartono, Ferry, & Yusuf, 2012). However, these efforts have failed to create an adequate farming income level, as in many cases, the government has not been able to convince the young generation to enter the agriculture sector. A critical aspect causing this failure is the unavailability of agricultural financing institutions in rural areas that act as empowering institutions apart from being credit distributors. This fact has been proven by the ineffectiveness of agricultural credit distribution institutions in rural areas, and hitherto, no adaptive credit model has been established for small-scale farmers in Indonesia (Sudrajat, Sawerah, & Permatasari, 2022). A strategic step related to farming success is required to minimize all obstacles. Therefore, from the empowerment perspective, what is needed is a deep understanding of aspects that can impact farming performance until the required facilitation step can be determined.

Based on the existing phenomenon, Rasau Jaya sub-district as the study location is considered appropriate to describe the dynamics of farmers' regeneration, particularly when life in the agricultural area is under the strong impact of city culture (Faturohman et al., 2023; Girdziute et al., 2022). Therefore, in addition to understanding certain phenomena currently observed in Rasau Jaya, it is essential to analyze two aspects. The first is the dynamics and behavior of young farmers determining their entry into and exit from the food-based agriculture sector; a thorough understanding of this aspect can be obtained from a comprehensive description of the occurring regeneration pattern. The second aspect deals with analyzing certain factors that impact the farming performance of young farmers who have entered the food agriculture sector to gain information regarding the required guidance stages to improve their performance and encourage regeneration.

Previous research regarding the performance of young farmers in the case of Indonesia was conducted by Anwarudin, Sumardjo, Satria, & Fatchiya (2020) and Arvianti, Masyhuri, Waluyati, & Darwanto (2020). Anwarudin et al. (2020) reported several aspects, such as family, community, government, and market support, as critical external factors determining farming (agribusiness) performance. Moreover, other aspects that determine internal factors are farmer motivation, perception, access to information technology, and formal education. Consistent with these findings, Arvianti et al. (2020) reported that the farming performance of young farmers is impacted by their individual characteristics, economic environment, socio-cultural environment, management abilities, and interests. However, these two findings have not been linked to several aspects related to individual characteristics, such as entrepreneurial orientations; therefore, in this study, it is necessary to identify several aspects that determine young farmers' farming performance to find a road map for smoothing their regeneration.

Referring to several variables that can potentially impact young farmers' farming performance, in this study, we have considered agricultural education in the family, farming

financing support, and agricultural entrepreneurial orientation as relatively more specific factors. The role of agricultural education in the family in encouraging farmer regeneration is reflected in the results reported by Firdaus, Ebekozien, Samsurijan, & Rosli (2024) and Ambarwati & Chazali (2024). Furthermore, the impact of entrepreneurial orientation in supporting business performance is generally proven in the research by Cho & Lee (2018), whereas the role of financing (credit) and financial support from parents in improving farming performance is no longer in doubt. Currently, the role of these four aspects on the young farmers' farming performance requires empirical quantitative testing. Apart from that, it is also necessary to formulate interrelationships between variables to provide direction in developing relatively more appropriate intervention strategies to strengthen the regeneration of small-scale farmers, particularly in the context of developing countries.

RESEARCH METHOD

Research Location

This study was conducted from April until December 2023 in Rasau Jaya Sub District, Kubu Raya Regency, precisely at Rasau Jaya Villages 1, 2, and 3 and Bintang Mas Village. The large Rasau Jaya Sub District has an area of roughly 211.34 km2 and is 30–40 km away from Pontianak City, the capital city of West Kalimantan Province (see Figure 1). Moreover, it is located in a wetland in the coastal area of West Kalimantan Province with an agroecosystem landscape of a peatland where the soil type for farming is dominated by peat soil. A peatland is formed from a pile of organic material that does not decompose perfectly and is categorized as marginal land.

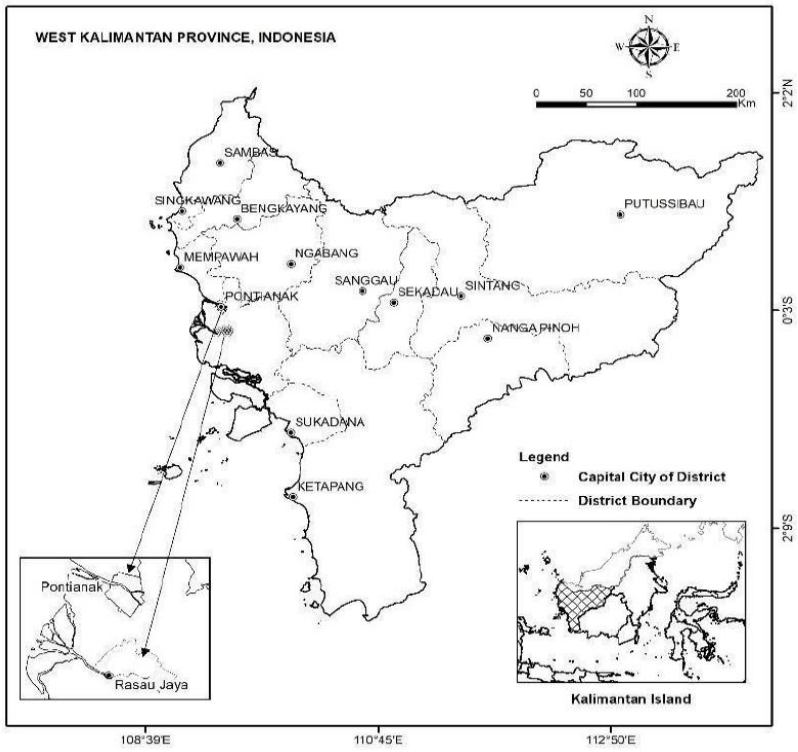

FIGURE 1. MAP OF RESEARCH LOCATION

Data Collection Method

Data collection covered both primary and secondary data. The collected secondary data covered the area condition and its performance in horticulture production, whereas the primary data were the data category obtained directly from the respondents as the informants. Primary data were collected using a structured questionnaire as an interview guide, supplemented by unstructured interviews to provide additional qualitative insights. Herein, we employed mixed approaches, including both qualitative and quantitative. The qualitative approach was used to describe the behavior of village youths entering or exiting the agriculture sector. Moreover, the quantitative approach was to identify the determinant factors of the farming performance of young farmers who have chosen agriculture as their livelihood. Following Creswell, J.W. & Creswell (2018), we employed an exploratory sequential mixed-methods design, beginning with qualitative data collection followed by quantitative analysis.

Qualitative data were collected through deep interviews with selected respondents, along with short interviews and observations. The informants' selection for the interviews was based on the type of information to be gained, and the interview was performed repeatedly or applied using the triangulation method to ensure the reliability of the collected data. For example, to gather information regarding several internal factors that determine farming success, in-depth interviews were initially conducted with seven successful young farmers and then followed by in-depth interviews with five young farmers who were not (yet) successful in comparison. All steps in this qualitative method, which covered the aspects of data collection, data analysis, and making conclusions, were performed simultaneously. Moreover, in practice, it also involved discussions among our research team members. Quantitative data collection was performed through a survey involving structured interviews with 51 respondents spread across the four villages. The sampling technique was purposely used based on the reality of a small number of young farmers and the unavailability of prior data regarding who could be categorized as a young farmer in a community; therefore, in this study, we started by collecting the data of young farmers' population first from each unit of farmers' residences.

Data Analysis Method

The data analysis method used here was based on the quantitative approach to analyze the correlation between the determinants of young farmers' farming performance (success). In this study, the farming performance of young farmers was analyzed based on the area of land under continuous vegetable cultivation, which has reached at least 0.5 ha. Next, data analysis was approached using the Spearman rank correlation method. Some variables related to farming performance were accessed to external finance, agricultural education in the family, financial support from parents, and the entrepreneurial orientation of farmers, providing confidence, patience, and perseverance in farming. The first three variables represent external factor support, whereas the last variable represents farmer inherent attitude, which can also be aligned with a farmer's motivation aspect. Referring to Anwarudin et al. (2020), the external factors are understood to directly impact agribusiness performance, whereas the internal factors will determine entrepreneurial capacity first as an intermediate variable and

then determine agribusiness performance as an endogenous variable. Mathematically, the Spearman rank correlation in this study was formulated using Equation (1) as follows:

$$rs = 1 - \frac{6 \sum d^2}{n (n^2 - 1)} \quad (1)$$

where *rs* represented the coefficient of Spearman correlation, *d* was the difference between the ranks of two variables, and n represents the number of samples. For the purposes of the Spearman rank correlation analysis, all variables farming performance, access to external finance, agricultural education in the family, financial support from parents, and agricultural entrepreneurship orientation were measured on ordinal scale of 1-4: 1 (very poor), 2 (poor), 3 (good), 4 (very good).

RESULTS AND DISCUSSION

Characteristics of Young Farmers

In Rasau Jaya, the main farming commodities cultivated by the farmers were various vegetables, such as sweet corn, long beans, mustard greens, cucumber, eggplant, and chilies. Moreover, although in small numbers, a few commodities with high economic value, such as other horticulture plants and plantations, were also cultivated. These other horticulture plants covered fruits (papaya and water apple) and tubers (taro and ginger), whereas the plantations included palm oil and rubber plants. On the contrary, their primary livestock was beef cattle. Moreover, they also produced broiler chicken and laying chicken marketed by certain companies. The presence of these cattle was extremely critical, as they produced organic fertilizer needed to support horticulture cultivation in peatland. In this context, the integration pattern of beef cattle and plants seemed extremely prominent in ensuring the sustainability of their farming.

In farming practice, young farmers mostly followed the examples of their parents in general and applied the diversification strategy by planting more than one commodity (2–4) in a single expanse of land, which had been divided into several land plots. This diversification strategy was applied to decrease farming risks, which were likely to occur because of price fluctuations, climate uncertainties, pest attacks, and plant diseases. Even though there were only a few young farmers, they were more productive than older farmers because of their physical ability and entrepreneurial orientation. For instance, young farmers were more interested in cultivating cash crops, which provided faster yields and higher profits. Therefore, in certain conditions, while even facing relatively high farming risks, they tended to cultivate vegetables and other horticultural plants. This fact is supported by the report of Arvianti et al. (2020) regarding the high demand for young farmers in horticultural farming in Malang, Indonesia, which implies that young farmers are more willing to take risks than older farmers, as also identified in the findings of Ambarwati & Chazali (2024). On the contrary, even though many older farmers in Rasau Jaya planted vegetables, many also planted cash crops only when these farmers could afford to cultivate additional plants. The general description of demography and land

cultivated by young farmers in the four villages within the study location has been presented in Table 1.

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF YOUNG FARMERS IN RASAU JAYA (N=51)

Variable	Category	Descriptive Result (Farmers)	Proportion (%)
Farmers' age (years)	20–30	11	21.57
	31–40	40	78.43
Number of dependents (people)	1–2	15	29.41
	3–4	34	66.67
	>4	2	3.92
Education	Not graduated from elementary school	3	5.88
	Elementary school	6	11.76
	Junior high school	15	29.41
	Senior high school	26	50.98
	College	1	1.96
Farming experience (years)	1–5	17	33.33
	6–10	23	45.10
	11–20	11	21.57
Area of cultivated land (hectares)	0.25–0.50	22	43.14
	0.51–1.00	21	41.18
	1.01–2.00	6	11.76
	>2	2	3.92
Status of house ownership	Parents' house	11	21.57
	Self-owned house	39	76.47
	Rent	1	1.96
Farming as the main job	Yes	44	86.27
	No	7	13.73
Occasionally become farm wage laborers	Yes	8	15.69
	No	43	84.31

It can be seen from Table 1 that most of the young farmers (78%) were aged 31–40 years, and only a few of them (22%) were aged <30 years, implying that the decision to become a farmer is made more often after attaining the age of 30 years than earlier. Thus, it can be understood that the age group of 21–30 years is considered the time to search for a livelihood option. This age trend of young farmers is in line with the findings of Arvianti, Masyhuri, Waluyati, & Darwanto (2019) on horticulture farmers in Malang, Indonesia. In line with the age of most of these farmers, it can be seen that most of the young farmers (76%) in Rasau Jaya owned their own houses, whereas the rest continued to live in their parents' houses. Moreover, most of them (68%) had an ideal family with 3–4 dependents, in line with the recommendation from the Indonesian Government. Likewise, their educational achievements were better than those of others, with 50.98 and 29.41% having graduated from senior and junior high school, respectively. Regarding their farming experiences, in line with the ages of most young farmers, most (45%) had 6–10 years of experience, and 33% had an experience of ≤5 years. Further, based on the perspective of access to land, roughly 41% of young farmers had cultivated land with an area of 0.51–1.00 ha, and approximately 43% had a relatively more narrowed land covering an area of 0.25–0.50 ha. Moreover, those who had cultivated land area of >1 ha were

less than 16%. The characteristics of formal education level and cultivated land area among young farmers are consistent with the findings of Retriansyah (2023), who reported a similar trend. In this context, a cultivated area of 0.5–1.0 ha has been considered sufficient for the size of family farming, which concentrates on vegetable farming, considering that the maintenance and routine monitoring of vegetable cultivation needs intensive daily attention. In general, however, a young farmer's family in Rasau Jaya consisted of only a husband and wife who actively worked, hiring wage laborers only for certain jobs.

Farmer Regeneration Characteristics

Understanding farmer regeneration characteristics is a critical dimension because a comprehensive understanding will determine the appropriate guidance stage such that effective efforts can be made to ensure a smooth regeneration path. For instance, based on the results obtained in this study, it can be understood that the period from teenage (15–20 years) to adulthood is the most critical initial point in determining if a farmer's child will become a farmer or exit from farming. In this period, participation in family farming becomes a defining moment for the smooth running of their regeneration process (Firman, Daud, & Arief, 2023). Thus, in this period, the dynamics of making livelihood-related decisions are extremely high, and the determinant is the choice of a sector that can provide a hope of satisfactory income. This phenomenon is consistent with the findings of Nag et al. (2018) and Bavorová, Ullah, Garcia, & Cavicchioli (2025) that farming income frequently becomes the main determinant for young farmers to enter the farming sector. Therefore, it is important to pay attention to this transition period while guiding farmers' children. The dynamic process of youth entering or exiting agriculture in Rasau Jaya has been illustrated in the flow chart Figure 2.

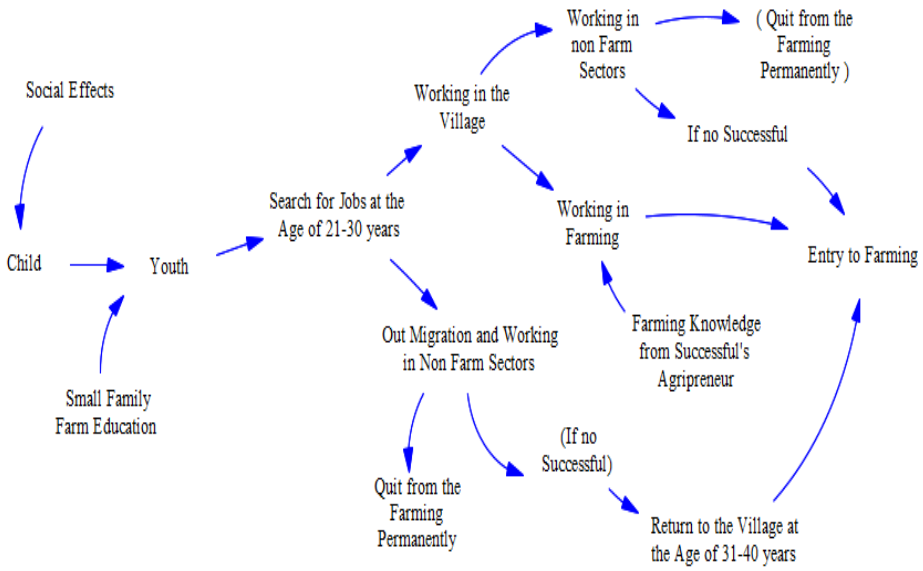

FIGURE 2. FLOW CHART OF YOUTHS ENTERING AND EXITING FROM AGRICULTURE IN RASAU JAYA

As explained earlier, most young farmers were 31–40 years old and generally married between the ages of 21–30. However, during this period (21–30 years), many were also busy

searching for jobs and had not yet decided whether to pursue farming or migrate out of the village. This decision largely depended on the choice made by man or husband during his teenage. If the husband had an interest in farming from childhood through his teenage years and frequently helped his parents on the farm, he was more likely to choose farming as a career. However, this choice also strongly depended on their parents' economic condition. The married sons of farmers, who do not have enough capital, often work temporarily in the non-agriculture sector to collect capital. Subsequently, after enough capital is collected, they enter farming by renting land. Usually, this process is done stage by stage and carefully. If they succeed in farming, they choose farming as their main source of livelihood. This implies that this process applies to every son from a well-established farming family (not in the rich category in the village). Moreover, family farms are frequently run only by a son and rarely by a daughter. This fact is in line with the findings of Unay-Gailhard, Bavorová, Bednaříková, & Ponkina (2019), that girls tend not to want to work in the agricultural sector. If a young girl works in the non-agriculture sector before marriage, it is primarily to save money. Only a few work to support their parents' financially. After getting married, the girl adopts her husband's livelihood.

If a young farmer decides to pursue farming but does not achieve success or significant economic stability, they may repeatedly shift between agriculture and the non-agriculture sector. This implies that if there remains an opportunity to work outside agriculture, then they will exit provisionally before coming back to the agriculture sector again. However, if a job outside agriculture has reasonable prospects and can ensure household income, then they may decide to exit from agriculture forever. On the contrary, if the job in the non-agriculture sector does not ensure a satisfactory life, then in the end a young farmer will go back to agriculture. At this point, a young farmer needs support to have better hope in the agriculture sector than available in the non-agriculture sector.

On the contrary, there was also the case of a young farmer whose livelihood was not satisfactory and who chose to live in the village because of his incapability to enter the non-agriculture sector owing to various reasons. This young farmer became an agricultural laborer in this village, in addition to cultivating their own land. This showed that the agriculture sector retained hope for certain youth in these villages. Moreover, some youth even contended that life would be better if they could succeed in agriculture because they could determine their own work time rather than being ruled by others if they worked in a company. This phenomenon was understood by young farmers that a successful farming career would enable them to lead a calm life until their old days. This last fact is consistent with the finding of Magagula & Tsvakirai (2020) who stated that some youth exhibit a positive economic perspective toward the agriculture sector and that it is necessary to conduct a program that can encourage agripreneurship.

Determinants of Young Farmer Farming Performance

Amid a strong trend where the village youth tend to leave agriculture, a few young farmers naturally entered the agriculture sector, as illustrated in Figure 2. A few of these young

farmers have shown their achievements, marked by their ability to build independent houses or buy agricultural land using their earnings from farming. This good farming performance will convince young farmers to continue choosing farming as their main source of livelihood. In this context, it is understood that farmer regeneration will occur well if the farming activity has proven successful in creating income. This determinant of successful farming will certainly be impacted by some factors related to the farmers or their community. The results of the correlation analysis of various variables with the performance (successfulness) of farming in the study location have been presented in Table 2.

TABLE 2. CORRELATION OF SOME VARIABLES TOWARD FARMING PERFORMANCE

No.	Variable	Spearman Correlation Coefficient	Significance†
1.	Access to external finance (X_1)	0.454	0.001***
2.	Agricultural education in the family (X_2)	0.425	0.002***
3.	Financial support from parents (X_3)	0.105	0.462
4.	Agricultural entrepreneurship orientation (X_4) #	0.826	0.000***

*Notes: *** significant at $p < 0.01$; #Agricultural entrepreneurship orientation covers the dimensions of confidence, patience, and perseverance in farming; † Reported p-values are rounded to three decimal places. Values reported as 0.000 indicate $p < 0.001$.*

The results of the Spearman correlation analysis presented in Table 2 reveal that the variable agricultural entrepreneurship orientation (*X4*), covering the dimensions of confidence, patience, and perseverance, exhibited a significant and strong correlation with farming performance. Likewise, the variables access to external finance (*X1*) and agricultural education in the family (*X2*) exhibited a significant correlation with farming performance, even though with a moderate level of correlation closeness. A more detailed description of the relationship between farming performance variables and their determinants can be seen in the descriptive results of Table 3.

The results in Table 3 indicated that the performance of young farmers' farms is classified as good to very good, at approximately 72.55%. This is supported by the agricultural entrepreneurship orientation variable, which is also classified as good to very good range, reaching approximately 86%. Meanwhile, access to external finance is categorized moderate, at approximately 37%. Likewise, agricultural education in the family plays a significant role, classified as good to very good range, with a score of approximately 86%. Conversely, financial support from parents is predominantly rated as very low to low, affecting roughly 75% of young farmers, indicating limited parental financial capacity.

The performance indicator of farming in this research is based on the criterion of cultivated land area, which indicates a better family life. In this case, land access is known to be a determinant of farming performance, in addition to the role of three other variables, as mentioned above. Thus, land ownership is necessary to ensure that young farmers can survive farming and improve their farming performance (Haryati et al., 2024). In this context, access to land enables young farmers to manage their lands and not become farming laborers (Arvianti et al., 2019). In general, young farmers inherit farming lands from their parents. However, some young farmer own a portion of their farmland while renting the rest. In addition, a few farmers have acquired land loans from landowners in the city because certain agricultural lands in Rasau Jaya are owned by landowners from Pontianak City. This is a new phenomenon observed in agricultural regions located in suburban areas.

TABLE 3. DESCRIPTIVE STATISTIC OF YOUNG FARMER FARMING PERFORMANCE AND ITS DETERMINANT

Variable	Category	Descriptive Results (Farmers)	Proportion (%)
Farming performance	very poor	2	3.92
	poor	12	23.53
	good	16	31.37
	very good	21	41.18
Access to external finance	very poor	13	25.49
	poor	19	37.26
	good	16	31.37
	very good	3	5.88
Agricultural education in the family	very poor	2	3.92
	poor	5	9.80
	good	33	64.71
	very good	11	21.57
Financial support from parents	very poor	20	39.22
	poor	18	35.29
	good	12	23.53
	very good	1	1.96
Agricultural entrepreneurship orientation	very poor	0	0
	poor	7	13.73
	good	26	50.98
	very good	18	35.29

Regarding the agricultural entrepreneurship orientation variable, which significantly determines farming performance, the results revealed that the young farmers who succeeded in the study location exhibited perseverance. It can be inferred from continuous production activity and their attitude of not being afraid of trying new approaches and strategies. Young farmers were willing to create innovation in farming and applied improved business management practices in farming. There was a belief in young farmers that they will invite success through perseverance. This aspect is consistent with previous reports in the business world that entrepreneurial orientation truly impacts business performance (Cho & Lee, 2018). In this context, business-oriented young farmers will invariably have a clear business vision and be oriented toward success. This can be proven based on their income achievement level, which tends to increase even though they frequently face price-and climate-related uncertainties. This fact is in line with the view that the traits of perseverance, leadership, creativity, initiative, and market orientation will positively impact farming development (De Lauwere, 2005). The results of the present study once more revealed that the support toward increasing the capacity of young farmers in terms of their entrepreneurship skills is an extremely important dimension (Akrong & Kotu, 2022; Ouko, Ogola, Ng'on'ga, & Wairimu, 2022), particularly for young farmers who have started to choose agriculture as their livelihood. Acquiring agripreneurial skills can help achieve food security by assuring the availability, accessibility, and reach of food products (Kazungu & Kumburu, 2023).

Next, the analysis results presented in Table 2 reveal that access to external farming finance exhibits an extremely significant correlation with farming performance. Even though

the correlation closeness level is moderate, this result efficiently demonstrates the importance of easy access to farming finance in a village. Based on the FAO (2018) report, only approximately 17% of small-scale farmers in Indonesia enjoy loans. The low access to farming loans is related to the lack of an adaptive loan model for financing the agriculture sector in Indonesia (Sudrajat et al., 2022) because, in reality, microloan institutions in a village either tend to finance non-agriculture sectors or provide consumptive loans. This is because the agriculture sector involves high business risk, and income from small-scale farming is uncertain. However, loan access has been proven to smooth agricultural production and improve farmers' income in villages (Akoijam, 2012; Ogundeji, Donkor, Motsoari, & Onakuse, 2018). Moreover, the potency of financial support received from parents is also minimal. The results of the present study also proved that financial support from parents (*X3*) does not significantly impact young farmer farming performance. This is because the quality of life of most of the farmers in Rasau Jaya is not satisfactory. As mentioned, many young farmers initially gain capital for farming finance through non-farming jobs by migrating out of their villages. This fact proves that one of the various kinds of support young farmers need is initial capital (start-up capital) to begin farming (Mulema et al., 2021).

In line with the results for access to external finance, the agricultural education aspect in a farmer's family exhibited an extremely significant correlation with young farmers' farming performance. This result efficiently indicates that the basis of farming knowledge thus far tends to be obtained from personal experience following parents' habits. In family-based agricultural education, parents contribute to knowledge and skill transmission (Nandi, Pratheepa, Nedumaran, Rao, & Rengalakshmi, 2022). Further, this dimension implies that learning farming skills from an older farmer, including parents or a relatively more senior and successful farmer, is also the key to success in entering the agriculture sector. It implies that on-the-job training at the farm of a successful farmer is key to the emergence of a new farmer. This pattern seems to be consistent with the findings of Adeyanju et al. (2023) who showed that the agripreneurship empowerment program has proven quite effective in improving agripreneurship skills in Africa. On the contrary, in the present study, we found that the presence of information media and the internet did not make a considerable contribution in finding the relevant technology, particularly in facilitating the success of cultivation in farming land. Communication media is used relatively more to ensure smooth production-based marketing, including finding price information or finding merchants who are willing to buy farming products.

Next, this study indicates that agricultural entrepreneurship orientation exhibited a very strong and statistically significant correlation with agricultural education from parents while also exhibiting an significant correlation with access to external finance, even though both these variables correlated only moderately with each other (Table 4). It means that agricultural education in the family (*X2*) is extremely important to develop entrepreneurship orientation. This aspect is highly likely to favor farmer regeneration because agricultural education in the family contributes to developing agripreneurship skills, which, in turn, help build confidence to enter farming. Moreover, access to external finance acts as a smoother, providing strong

support toward entrepreneurship orientation, which, in turn, enhances farming performance. In this context, financial support plays the role of a moderating variable that connects personal factors and farming performance, as the correlation between these variables was modeled by (Addo, 2018).

TABLE 4. CORRELATION BETWEEN VARIABLES AND AGRICULTURAL ENTREPRENEURSHIP ORIENTATION

No.	Variable	Spearman Correlation Coefficient	Significance†
1.	Access to external finance (X_1)	0.345	0.013**
2.	Agricultural education in the family (X_2)	0.525	0.000***
3.	Financial support from parents (X_3)	0.178	0.211

*Notes: ***significant at $p < 0.01$; ** significant at $p < 0.05$; † Reported p-values are rounded to three decimal places. Values reported as 0.000 indicate $p < 0.001$.*

Perspective on Regeneration Reinforcement

In the present condition, for the case in Rasau Jaya, farmer regeneration remains relatively difficult, and this is likely to prevail for many other farming regions. According to Pranandari & Paramita (2025), this case is related to the growth of stereotypes, which have developed in the community. At least two stereotypes act as obstacles in farming regeneration. The first stereotype relates to the strong point of view that agriculture is the domain of males, as the rights on agricultural lands, in general, are passed on to males. Consequently, females seldom want to continue in the agriculture occupation. The second stereotype relates to another strong opinion that the farming profession is frequently synonymous with poverty. This opinion then gives rise to the fear of the poverty trap when young farmers determine their choice toward agriculture jobs. The perception of this fear in those who come from non-farming families can probably be understood because these families will need to change their occupation to become farmers, which is not a simple thing to do. However, this is extremely ironic for farming families because their children usually have adequate knowledge regarding agriculture from an early age. It is reported that the pessimistic approach toward agriculture hits youth in developing and developed countries alike (May, Arancibia, Behrendt, & Adams, 2019), and efforts to ensure the empowerment of farming youth are strongly required to prevent an increase in the proportion of youth who leave agriculture.

Based on this fact, the efforts to pave the way for regeneration must start by providing adequate support to young farmers to prove that a farmer can lead a prosperous life. This dimension is pivotal for a young farmer because the perception of poverty is the main key that inhibits regeneration. Thus, not only merely the stereotype problem but also the problem of inadequate income needs to be dealt with. It has been proven that when the community cultivates a certain commodity that has low market value and offers a low prosperity level, then the disinterest in becoming a farmer becomes relatively high. Research has shown that only approximately 63 and 54% of children of horticulture and rice field farmers, respectively, want to become farmers (Wibowo, Suharno, & Alfarisy, 2024). Thus, the prosperity consideration is supposed to be a major determining factor affecting sustainability in the village community through real and rational stages. The first step required is to increase the

right support in the household of a farmer, particularly for young farmers who have chosen agriculture as their main source of livelihood.

Referring to the aspect of the regeneration stage based on the succession stage, which occurs in the family of a farmer in a developed country, it is known that the succession stages at least cover three stages, namely potentiality, willingness, and effectiveness (Bertolozzi-Caredio, Bardaji, Coopmans, Soriano, & Garrido, 2020). Moreover, the determinant factor of its succession will consist of four dimensions, namely individual, family, institution, and contextual dimensions. The understanding of this succession has been explained below. The first stage is the potentiality stage, i.e., when the parent becomes aware of the potential of an individual child as the successor in the future. Chiswell (2014) divides this stage into two categories, namely the possible successor category and the prospective successor category. A possible successor has the potential to be the successor of a farmer in the future, whereas a prospective successor has tried to manage or become the manager owing to collective acknowledgment from farmers and their families. At the potential stage, an individual child and their family represent an essential factor determining real regeneration; however, its contextual aspect covers the point of view of the child toward the economic dimension, social dimension, and environmental dimension, although its role remains relatively small. In this stage then the parents' role and environmental role become crucial in the formation of young farmers. Therefore, a positive intervention at this stage becomes extremely important in smoothing the regeneration process.

The next stage is represented by willingness, namely when a child has stated their desire to become a farmer (taking over the farm). The last is the third stage, i.e., the effectiveness stage, when an individual child has effectively become a farmer (taking over the farm). Based on this process, the empowerment of the family of a farmer at these three stages becomes the most strategic dimension to encourage successful regeneration. Therefore, a precise identification of the families of farmers must be performed under the guidance of the Department of Agriculture in each regency at the reinforcement stages to ensure farmer regeneration. The empowerment of family farmers is strongly required to strengthen the interest of an individual child in farming, particularly at the potentiality stage, as this stage encourages the birth of emotional bonding, feeling, awareness, knowledge, experience, skill, and ability, which determines the occurrence of regeneration.

In this study, while looking at a few regeneration-related aspects, we observed interconnectedness between important variables that can strengthen regeneration. Certain important required dimensions are agricultural education in the family, agricultural education from a successful farmer, agripreneurship skills, agripreneurial orientation, government support, and an adaptive microfinance institution in the village. The interconnectedness of all aspects determining farmer regeneration has been illustrated in Figure 3.

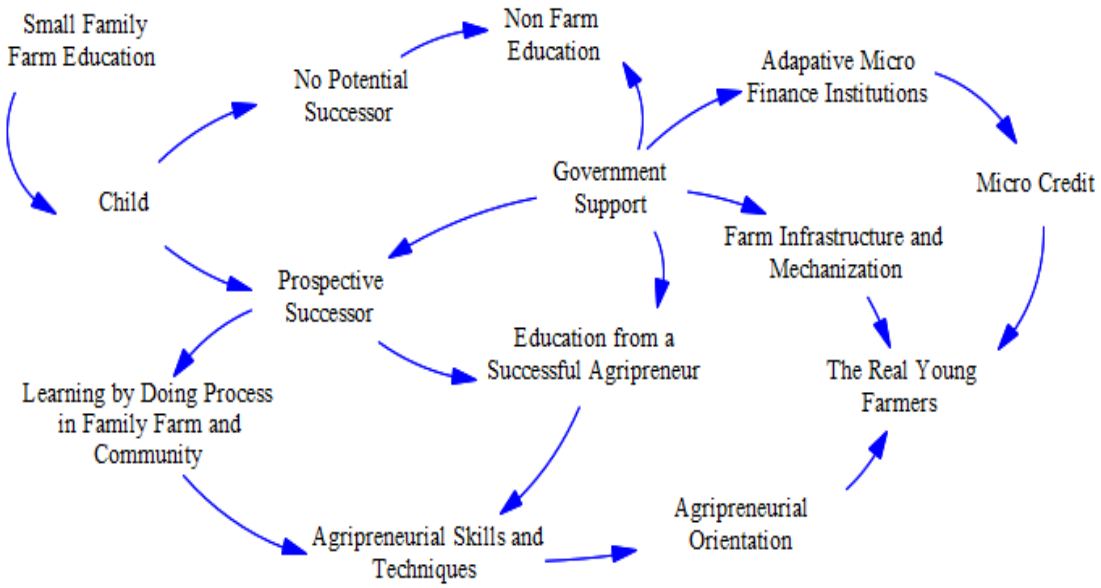

FIGURE 3. INTERCONNECTEDNESS FLOW CHART OF SOME ASPECTS THAT STRENGTHEN FARMER REGENERATION

CONCLUSION

The findings of this study provide valuable insights into the behavior of youth regarding their decision to enter or exit agriculture for various reasons. The results revealed a strong dynamic of entry or exit from agriculture in the children of farmers; however, the true determinant is the likelihood of this sector ensuring an expected quality of life or livelihood. Therefore, a policy that directs the achievement of an adequate farming income condition is crucial in encouraging natural farmer regeneration. Moreover, the performances of young farmers who have entered the agriculture sector are known to have a strong and significant correlation with their agricultural entrepreneurship orientation. On the one hand, it is believed that agricultural entrepreneurial orientation is determined by traits inherited by an individual; however, on the other hand, it has been shown that this orientation can be developed through intensive and directed guidance. Therefore, access to guidance related to agriculture entrepreneurship orientation for a young farmer currently holds the most strategic position in agriculture development because this aspect will pave the way for farmers' children to enter the farming sector. Likewise, access to the external finance variable has an important role in ensuring a smooth succession of farming. In the end, this aspect will strengthen or facilitate farmer regeneration. Finally, the variable agricultural education in the family also exhibited an extremely strong and significant correlation with farming performance. In this context, when a farmer's child is identified as a capable prospective successor, targeted support from agricultural extension institutions is essential to facilitate effective farmer regeneration.

Acknowledgments: This study was supported by the Universitas Tanjungpura Research Funding 2023 and authors are grateful for the financial services.

Authors Contributions: JS: Contributed preparation of research plans, surveys, data processing and analysis, result and discussion, and writing article; WF & AS: Contributed to the surveys, data processing and analysis, result and discussion, and writing article.

Conflict of Interest: The authors declare no conflict of interest.

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