



**Studi Perspektif Pemuda tentang Regenerasi Sektor Pertanian:  
Studi Kasus di Kabupaten Karanganyar**  
*Youth Perspective Study on Agricultural Sector Regeneration:  
A Case Study in Karanganyar Regency*

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**Abstract**

The agricultural sector plays a strategic role in supporting food security and sustainable economic development. However, this sector faces serious challenges in labor regeneration due to the low interest of younger generations in participating. The decline in youth involvement has the potential to threaten the sustainability of food production as well as the economic stability of rural areas. Although the issue of farmer regeneration has been widely discussed, in-depth studies examining youth perceptions of the agricultural sector at the local level remain relatively limited. This study aims to analyze youth perceptions of the agricultural sector in Karanganyar Regency and to examine the role of stakeholders in supporting the regeneration of the agricultural workforce. The research employs a qualitative approach with a case study method, using in-depth interviews with ten young people from both farming and non-farming families. Data were analyzed using content analysis techniques with source triangulation. The findings indicate that negative perceptions—such as the view that agriculture is synonymous with physically demanding work, high risk, and limited economic prospects—are the main factors contributing to low youth interest. However, the adoption of modern agricultural technologies, agribusiness-based education, and policy support have been shown to increase the attractiveness of the sector to younger generations. These findings highlight the importance of policies oriented toward agricultural modernization, the strengthening of technology-based education, and the renewal of the agricultural sector's image to accelerate the regeneration of young farmers.

**Keywords:** Farmer Regeneration; Youth Perceptions; Agricultural Technology; Agricultural Policy; Food Security

**Abstrak**

Sektor pertanian memegang peranan strategis dalam menopang ketahanan pangan dan pembangunan ekonomi berkelanjutan. Namun, sektor ini menghadapi tantangan serius dalam regenerasi tenaga kerja akibat rendahnya minat generasi muda untuk berpartisipasi. Penurunan keterlibatan pemuda berpotensi mengancam keberlanjutan produksi pangan serta stabilitas ekonomi wilayah perdesaan. Meskipun isu regenerasi petani telah banyak dibahas, kajian yang mengulas secara mendalam persepsi pemuda terhadap sektor pertanian pada tingkat lokal masih relatif terbatas. Penelitian ini bertujuan untuk menganalisis persepsi pemuda terhadap sektor pertanian di Kabupaten Karanganyar serta mengkaji peran pemangku kepentingan dalam mendukung regenerasi tenaga kerja pertanian. Penelitian menggunakan pendekatan kualitatif dengan metode studi kasus melalui wawancara mendalam terhadap sepuluh pemuda yang berasal dari keluarga petani dan nonpetani. Data dianalisis menggunakan teknik analisis isi dengan triangulasi sumber. Hasil penelitian menunjukkan bahwa persepsi negatif, seperti anggapan bahwa sektor pertanian identik dengan pekerjaan berat, berisiko tinggi, dan kurang menjanjikan secara ekonomi, menjadi faktor utama rendahnya minat pemuda. Namun, pemanfaatan teknologi pertanian modern, pendidikan berbasis

*agribisnis, serta dukungan kebijakan terbukti dapat meningkatkan ketertarikan generasi muda. Temuan ini menegaskan pentingnya kebijakan yang berorientasi pada modernisasi pertanian, penguatan pendidikan berbasis teknologi, serta pembaruan citra sektor pertanian untuk mempercepat regenerasi petani muda.*

**Kata kunci:** *Regenerasi Petani; Persepsi Pemuda; Teknologi Pertanian; Kebijakan Pertanian; Ketahanan Pangan*

## 1. Introduction

The agricultural sector remains a central pillar of the national economy and food security, particularly in rural regions such as Karanganyar Regency (Kartikasari et al., 2021; Saraswati et al., 2024; Sinurat et al., 2024; Winarno et al., 2024). Despite its strategic importance, the sector faces a serious structural challenge related to labor regeneration, as youth participation in agriculture continues to decline. Data from the Central Statistics Agency (BPS) of Karanganyar show that the proportion of young people aged 16–30 working in agriculture decreased from 20.79% in 2017 to 18% in 2023. Furthermore, most farmers are currently over 45 years old, while those under 35 account for only 6.20% of the agricultural workforce (BPS Karanganyar, 2023). This demographic imbalance indicates a weakening regeneration process that may threaten long-term agricultural productivity and food security (Kartikasari et al., 2021).

The transformation of the agricultural workforce is a crucial factor in driving sustainable economic growth, particularly in developing countries such as Indonesia. Regeneration of the agricultural workforce is not merely an effort to maintain employment levels within the sector, but also a strategic necessity to ensure long-term food security and economic sustainability. One of the key elements of this transformation is youth participation in agricultural activities. Although young people play a vital role in shaping the future of agriculture, their involvement has been steadily declining, posing a serious threat to overall food security and economic stability (Geza et al., 2021; Girdžiūtė et al., 2022).

The decline in youth participation in agriculture has become increasingly alarming in light of Indonesia's ongoing demographic transition. An aging farming population faces declining productivity, as well as generational gaps in agricultural skills and knowledge transfer (Poungchompu & Phuttachat, 2023; Nugroho et al., 2024). If this issue remains unaddressed, it may severely undermine the sustainability of the agricultural sector and jeopardize the availability of national food supplies.

One of the primary reasons for low youth engagement in agriculture is the negative perception of the sector. Many young people view agriculture as physically demanding, economically unprofitable, and socially less prestigious compared to careers in industry or services. This perception is supported by various studies indicating that agriculture is often associated with income instability, high risk, and unattractive working conditions (Geza et al., 2021; Girdžiūtė et al., 2022). Moreover, agriculture is frequently portrayed as a sector that lags behind in technological innovation, further reducing its appeal to younger generations. Rapid urbanization in Indonesia has intensified this trend, as employment opportunities in urban areas are perceived as more attractive than agricultural work in rural regions (Ogheneovo et al., 2023). This phenomenon is not unique to Indonesia; similar patterns are observed across many developing countries, where young people favor urban lifestyles due to perceived higher income potential and improved living standards (Mulei et al., 2020).

Young individuals from farming families tend to show a greater interest in continuing agricultural activities, as they possess prior knowledge and familiarity with the sector's challenges and opportunities (Obayelu & Fadele, 2019; Nugroho et al., 2024). In contrast, youth from non-farming families are more inclined to avoid agriculture and pursue careers considered more stable or lucrative, such as technology or service industries (Magagula & Tsvakirai, 2019; Consentino et al., 2023). This disparity underscores the need for more effective education and outreach strategies to bridge perception gaps and highlight the diverse opportunities within the agricultural sector.

Beyond perceptual and social factors, young people aspiring to enter agriculture also face structural and economic barriers. Limited access to capital and technology remains a major challenge. Without adequate financial resources, young farmers struggle to invest in modern equipment and innovative technologies that could enhance productivity and efficiency (Panda et al., 2020; Kiruthika & Asokhan, 2024). Addressing these challenges requires strategic interventions aimed at attracting youth to the agricultural sector. One crucial approach is rebranding agriculture by highlighting success stories of young farmers and advancements in agribusiness innovation (Simões & do Rio, 2020; Acharya, 2022).

Previous studies have identified several factors underlying the low participation of youth in agriculture, including perceptions of farming as physically demanding and economically unattractive (Mulema et al., 2021; Geza et al., 2023), limited access to land, slow adoption of modern technology, and inadequate institutional support in the form of training and extension services (Riyardi, 2002; Henning et al., 2022; Madende et al., 2023; Boye et al., 2024). At the macro level, existing research largely emphasizes structural issues such as rural–urban migration, labor shifts to non-agricultural sectors, and land fragmentation in developing countries (Xiao & Zhao, 2018; Lu et al., 2019; Gao et al., 2020; Ngadi et al., 2023).

Although the literature on youth regeneration in agriculture has expanded considerably (Fitz-Koch et al., 2018; Dias et al., 2019; Malanski et al., 2021; Rohlman et al., 2021), most studies remain macro-oriented and descriptive, focusing on demographic trends or general constraints. Insufficient attention has been paid to how young people themselves perceive the agricultural sector at the local level, how these perceptions influence their decisions to remain in or leave agriculture, and how stakeholder interventions interact with these perceptions (May et al., 2019). Moreover, empirical evidence on the role of modern agricultural technology and youth empowerment programs as strategic tools to reverse labor disengagement – particularly in specific local contexts such as Karanganyar Regency – remains limited.

Addressing this gap is crucial, as agricultural labor regeneration is fundamental to the sustainability of agricultural systems and long-term food security at both regional and national levels (Hasmarini & Purnomo, 2016; Sinurat et al., 2024; Winarno et al., 2024). A deeper understanding of youth perceptions enables policymakers to move beyond generic incentives and design targeted interventions that align with the aspirations, constraints, and technological expectations of younger generations.

Accordingly, this study aims to analyze youth perceptions of the agricultural sector in Karanganyar Regency and to examine the role of key stakeholders – government agencies, extension institutions, and community organizations – in supporting agricultural labor regeneration. Rather than merely identifying perceptions, the study evaluates how these perceptions interact with access to technology, training, and policy

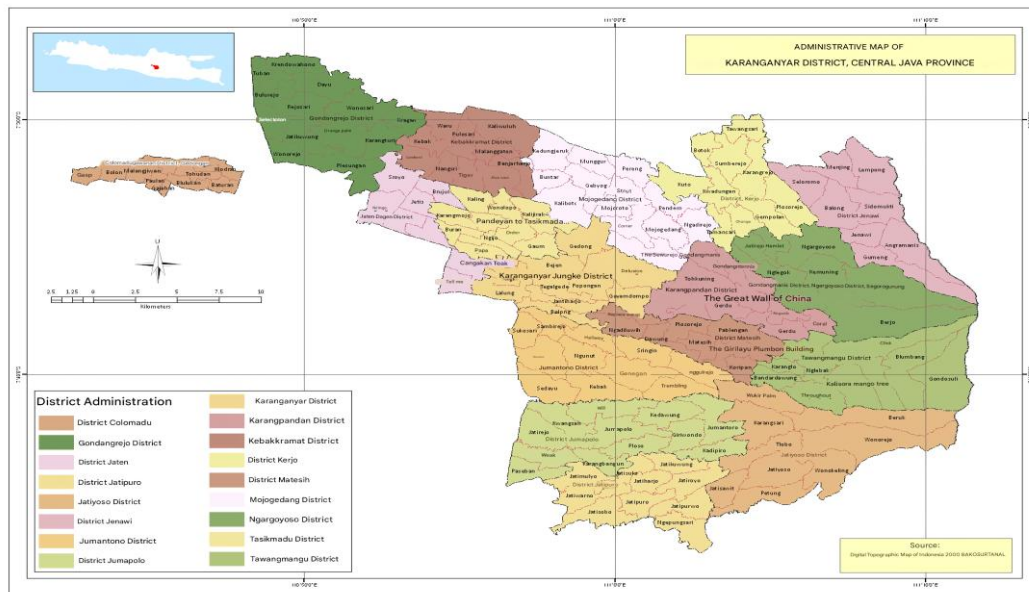
support to influence youth decisions to remain in or exit the agricultural sector. The findings are expected to contribute theoretically by enriching socio-economic models of agricultural labor regeneration and practically by informing evidence-based, technology-oriented, and youth-inclusive agricultural policies.

Despite the growing body of literature on youth and agriculture, existing studies predominantly focus on one dimension at a time – either examining youth perceptions in isolation, or analyzing structural barriers separately from the assessment of institutional support programs. To the best of the authors' knowledge, no prior study has simultaneously integrated all three dimensions – youth perceptions, structural barriers (such as land access, income uncertainty, and social stigma), and the effectiveness of government support programs – within a single analytical framework applied to a specific Indonesian local context. This study addresses that gap by offering an integrated, context-sensitive analysis of agricultural labor regeneration in Karanganyar Regency. The contribution is threefold: (1) it advances the theoretical understanding of how perceptions, structural conditions, and institutional interventions interact to shape youth decisions in agriculture; (2) it provides empirical evidence from a peri-urban agricultural district in Central Java that has experienced accelerated demographic and economic transition; and (3) it generates locally grounded policy insights that go beyond the generic recommendations typically produced by macro-level studies. By situating the analysis within Karanganyar's specific socioeconomic landscape – characterized by proximity to industrial zones, active land conversion, and declining youth agricultural participation – this study offers a nuanced perspective that is absent from comparative or cross-national research on the same topic.

## **2. Research Methods**

This study employs a qualitative approach using a case study design, which is particularly suitable for exploring complex, context-specific social phenomena that cannot be adequately captured through quantitative indicators (Baxter & Jack, 2008; Creswell & Poth, 2016). The selection of this approach is justified by the exploratory nature of the research problem, namely understanding youth perceptions of the agricultural sector and the role of stakeholders in supporting agricultural labor regeneration in Karanganyar Regency. Youth interest, motivation, and perceptions are socially constructed and strongly influenced by local socio-economic and institutional contexts; therefore, a qualitative case study allows for an in-depth and nuanced analysis that would not be achievable through survey-based or econometric methods.

Karanganyar Regency was selected as the study site due to its dual characteristics as an agricultural region that continues to experience declining youth participation in farming activities. This makes it a relevant and critical case for examining the challenges associated with agricultural labor regeneration. The primary objective of this study is to identify key factors influencing youth interest in agriculture, the obstacles they face, and potential strategies to enhance youth engagement in the sector.



**Figure 1.** Respondent Location in Karanganya Regency

Source: Digital Topographic Map of Indonesia, accessed 2025.

The study involved ten young respondents aged between 19 and 32 years. Respondents were selected using purposive sampling, which is appropriate when the research aims to obtain information-rich cases aligned with specific analytical objectives (Etikan et al., 2016).

The inclusion criteria applied in this study were as follows: (1) respondents must be aged between 15 and 35 years, consistent with Indonesia's national definition of youth as stipulated in Law No. 40 of 2009 concerning Youth; (2) respondents must originate from farming households or be directly engaged in agriculture-related enterprises, ensuring that participants possess firsthand knowledge of the sector's opportunities and constraints; (3) respondents must be domiciled in Karanganyar Regency at the time of data collection, as illustrated in Figure 1, to ensure contextual relevance; and (4) respondents must demonstrate willingness to participate and capacity to articulate informed perspectives on the agricultural sector, both positive and negative.

The exclusion criteria were: (1) individuals who had no direct or indirect exposure to agricultural activities, either through family background or professional experience, were excluded to maintain the relevance and depth of the data; and (2) respondents who were unable to complete the full interview session were excluded from the final analysis. The rationale for these criteria is to ensure that the data generated reflect the genuine lived experiences of youth who are navigating agricultural career decisions in a local context, rather than abstract attitudes held by those entirely disconnected from the sector.

Primary data were collected through in-depth, semi-structured interviews using open-ended questions to allow respondents to freely express their perceptions, experiences, and expectations (Legard et al., 2003). Interviews were conducted either face-to-face or via digital platforms, depending on the availability of the informants. The core interview questions are presented in Table 1. To enhance analytical depth and contextual understanding, secondary data were also utilized, including government reports, official labor statistics, and relevant Scopus-indexed journal articles related to youth employment and agricultural development in Karanganyar Regency.

**Table 1.** Interview Questions

| No. | Main Questions                                                                                                                       |
|-----|--------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | What do you think about the agricultural sector as a profession?                                                                     |
| 2.  | What makes you interested or not interested in working in the agricultural sector?                                                   |
| 3.  | Do you think the agricultural sector has promising prospects? Why?                                                                   |
| 4.  | Do you or your family have hands-on experience in the agricultural sector? How did the experience affect your outlook?               |
| 5.  | What are some of the main obstacles you feel about working in the agricultural sector?                                               |
| 6.  | What is your view of working conditions in the agricultural sector compared to other sectors?                                        |
| 7.  | Are the current training programs or government policies enough to help the younger generation enter the agricultural sector?        |
| 8.  | How do you think modern technology can help increase the younger generation's interest in the agricultural sector?                   |
| 9.  | Do you feel that there is enough access to agricultural technology in Karanganyar?                                                   |
| 10. | What is your friend's or community's view of working in the agricultural sector?                                                     |
| 11. | How much support from your family or environment is there in considering the agricultural sector as a career choice?                 |
| 12. | What needs to be changed or improved in the agricultural sector to make it more attractive to the younger generation?                |
| 13. | What kind of support do you expect from the government or other institutions to support the regeneration of the agricultural sector? |
| 14. | Are there any examples of success in agriculture that you think can be an inspiration for the younger generation?                    |
| 15. | What role can youth play in the future to support the sustainability of the agricultural sector?                                     |

To improve transparency and allow readers to better understand the contextual background of the participants, Table 2 presents the demographic profile of all ten respondents. The characteristics documented include age, sex, educational background, current occupation, farming experience, and family farming background.

**Table 2.** Demographic Profile of Respondents

| Respondent | Age | Sex    | Education                    | Current Occupation        | Farming Experience    | Family Farming Background |
|------------|-----|--------|------------------------------|---------------------------|-----------------------|---------------------------|
| R1         | 22  | Male   | Undergraduate (Agribusiness) | University student        | < 1 year (internship) | Yes (paddy farming)       |
| R2         | 25  | Male   | Vocational High School       | Agricultural entrepreneur | 3 years               | Yes (horticulture)        |
| R3         | 19  | Female | Senior High School           | Student                   | None                  | Yes (paddy farming)       |
| R4         | 28  | Male   | Undergraduate (Economics)    | Factory worker            | None                  | Yes (mixed farming)       |

|     |    |        |                                 |                                        |         |                            |
|-----|----|--------|---------------------------------|----------------------------------------|---------|----------------------------|
| R5  | 32 | Male   | Undergraduate<br>(Agriculture)  | Young<br>farmer /<br>agripreneur       | 5 years | Yes (paddy &<br>vegetable) |
| R6  | 24 | Female | Undergraduate<br>(Education)    | Private<br>sector<br>employee          | None    | No                         |
| R7  | 27 | Male   | Vocational<br>High School       | Farmer<br>(part-time)                  | 4 years | Yes (paddy<br>farming)     |
| R8  | 21 | Female | Senior High<br>School           | Student                                | None    | No                         |
| R9  | 30 | Male   | Undergraduate<br>(Agribusiness) | Agricultural<br>extension<br>volunteer | 3 years | Yes<br>(horticulture)      |
| R10 | 26 | Female | Undergraduate<br>(Management)   | Private<br>sector<br>employee          | None    | No                         |

Note: Respondent identities are anonymized to protect privacy. Farming experience refers to direct involvement in agricultural production activities.

The demographic data reveal important contextual diversity among participants. In terms of age, respondents ranged from 19 to 32 years, representing both early adulthood and the transitional career stage. Educational backgrounds varied from senior high school to undergraduate level, spanning agribusiness, agriculture, economics, education, and management. Six respondents came from farming families, while four had no agricultural family background. This variation is analytically significant, as it enables cross-comparison of perceptions between youth with and without direct agricultural socialization. In terms of occupational status, respondents included active students, formal sector workers, part-time farmers, and agricultural entrepreneurs, providing a broad spectrum of perspectives on the sector's attractiveness and constraints.

Data analysis was conducted using qualitative content analysis, following the three-stage procedure proposed by Miles (1994). First, data reduction was carried out by coding and categorizing interview transcripts according to themes aligned with the research questions. Second, the data were organized and presented in narrative form and thematic matrices to facilitate interpretation. Third, conclusions were drawn by identifying recurring patterns, relationships, and contrasts across informants. To enhance the credibility and reliability of the findings, source triangulation was applied by cross-checking information from multiple informants and corroborating it with secondary data sources (Thurmond, 2001). This analytical strategy enables a more comprehensive understanding of youth engagement dynamics and agricultural labor regeneration processes.

### **3. Results and Discussion**

#### **Youth Perceptions of the Agricultural Sector**

The findings reveal that young people's perceptions of the agricultural sector are not homogeneous; rather, they are socially constructed through family background, educational experiences, and exposure to technology. Although the majority of respondents recognize agriculture as a crucial sector for ensuring food security, it is

simultaneously perceived as economically risky, socially undervalued, and physically demanding. This ambivalence reflects a classic duality in agricultural development, whereby agriculture is acknowledged as essential at the macro level, yet regarded as unattractive at the micro or occupational level.

From the perspective of agricultural economics, this phenomenon can be explained through the framework of expected income and risk. Youth originating from farming households or those with an educational background in agribusiness tend to assess agriculture not merely on the basis of current income volatility, but also in terms of its long-term economic potential when integrated with innovation and value addition. Their optimism aligns with endogenous growth theory in agriculture, which highlights technology adoption and human capital as key drivers of productivity and structural transformation within the sector (Chavas & Nauges, 2020). This perspective explains why respondents who are exposed to modern agricultural practices—such as hydroponics, precision agriculture, and mechanization—view agriculture as a forward-looking and progressive profession rather than a declining one.

*"Food is a basic human need... if there are innovations such as hydroponics or precision farming technologies, this sector can become more productive and modern."* (Interview, February 6, 2025)

This perception supports previous studies by Consentino et al. (2023) and Boye et al. (2024), who argue that access to technology and innovation ecosystems significantly enhances youth engagement in agriculture. The present study strengthens this body of literature by demonstrating that technological awareness not only increases interest, but also reframes agriculture as an entrepreneurial and knowledge-intensive sector.

Conversely, youth without direct experience in agriculture tend to associate farming with income instability, physical hardship, and limited opportunities for social mobility. From an economic standpoint, this perception is rational, as agriculture in many developing regions is characterized by price volatility, climate-related risks, and weak integration with markets. Geza et al. (2021) note that income uncertainty remains one of the strongest deterrents to youth participation in agriculture, a finding that is strongly corroborated by the interview data in this study.

*"The heat in the rice fields, and the results are not always stable."* (Interview, February 6, 2025)

These perceptions reflect the structural constraints of smallholder agriculture, where limited access to land, capital, and insurance mechanisms heightens vulnerability. From a development economics perspective, this reinforces the argument that youth disengagement from agriculture is driven not merely by attitudes or preferences, but by rational responses to systemic risks embedded in rural economic structures.

Interestingly, youth from farming families occupy an ambivalent position. While they possess deeper knowledge of agricultural practices, many have also been directly exposed to economic hardship, crop failures, and price shocks. These lived experiences generate both respect for agriculture and reluctance to pursue it as a primary livelihood.

*"Sometimes the harvest is good, but sometimes it fails."* (Interview, February 14, 2025)

This finding supports Wahid et al. (2018), who argue that the intergenerational transmission of farming knowledge does not automatically ensure occupational continuity. Instead, negative economic experiences may weaken farmer regeneration unless accompanied by meaningful structural improvements. Nevertheless, some respondents from farming households expressed a strong desire to modernize

agriculture, indicating that technology functions as a mediating factor that transforms inherited agricultural identities into future-oriented aspirations for innovation.

Social stigma also emerged as a significant determinant shaping youth perceptions. Agriculture is frequently associated with low social status, reinforcing young people's preference for employment in urban, industrial, or service sectors. Ephrem et al. (2021) similarly emphasize that cultural narratives and societal valuation of occupations play a crucial role in influencing youth career choices. In this context, agriculture's image problem is not merely a cultural issue, but a broader economic development challenge that affects labor allocation across sectors.

*"This profession is often considered 'lower class'."* (Interview, February 16, 2025)

From a regional development perspective, these perceptions carry important implications. Persistent youth disengagement from agriculture threatens the sustainability of agricultural production, accelerates the aging of rural populations, and weakens local food systems. However, the study also identifies a significant opportunity: youth interest increases when agriculture is framed as technologically advanced, market-oriented, and socially valued. This finding supports Milone and Ventura's (2019) argument that rebranding agriculture as an innovative and modern sector is essential for rural regeneration.

What distinguishes these perceptual dynamics in Karanganyar from findings in other regional or national contexts is the specific socioeconomic configuration of the regency. Karanganyar is situated at the intersection of an active agricultural zone and a rapidly expanding industrial corridor in Central Java. The proximity of industrial estates—particularly in the Palur and Gondangrejo sub-districts—creates an accessible and visible alternative labor market that directly competes with agriculture for youth attention and aspiration. Unlike youth in more remote or exclusively agrarian regions, young people in Karanganyar are simultaneously exposed to both agricultural traditions and the pull of factory employment with fixed wages and regular working hours. This structural duality amplifies the perceived opportunity cost of choosing agriculture, making the negative perceptions documented in this study more pronounced than those reported in comparable studies from predominantly rural areas in Eastern Indonesia or Sub-Saharan Africa (Ngadi et al., 2023; Geza et al., 2021). Furthermore, Karanganyar's relatively high Human Development Index (HDI) and expanding access to higher education have raised occupational aspirations among youth, reinforcing the social stigma attached to farming as a profession. These local conditions explain why even youth from farming families—who in other contexts might exhibit stronger agricultural identity—express ambivalence or reluctance, as the structural incentives available to them favor non-agricultural career paths.

Compared to previous studies, this research contributes by demonstrating that youth perceptions are shaped not only by economic incentives, but also by the interaction between personal experience, risk exposure, and technological narratives. While earlier research often treats youth as a homogeneous group, the present findings highlight differentiated perception patterns that require targeted and context-specific policy responses.

Overall, the findings suggest that increasing youth participation in agriculture requires more than motivational campaigns or awareness programs. Structural interventions—such as improved access to technology, income stabilization mechanisms, and enhanced social recognition—are essential to transform agriculture into a viable,

resilient, and attractive career pathway for younger generations, particularly in regions such as Karanganyar.

### **Factors Affecting Youth Interest or Disinterest in the Agricultural Sector**

The findings indicate that youth interest or disinterest in the agricultural sector is influenced by a combination of economic, structural, informational, and socio-cultural factors. Rather than being shaped solely by individual preferences, youth decisions represent rational responses to perceived risks, opportunity costs, and institutional constraints within the rural economy.

One of the most significant factors discouraging youth participation is the perception of agriculture as physically demanding work with uncertain financial returns. From the perspective of agricultural economics, this perception aligns with the theory of occupational choice under risk, whereby individuals compare expected income levels and income volatility across different sectors. Compared to wage-based employment in industry or services, agriculture is viewed as highly vulnerable to price fluctuations, climate variability, and production failure.

*"Working under the scorching sun with unstable results made me hesitate to enter the sector."* (Interview, February 6, 2025)

This finding is consistent with Albizua et al. (2021), who argue that negative youth perceptions often stem from limited exposure to modern farming systems that reduce labor intensity and stabilize income. Similarly, Ngadi et al. (2023) demonstrate that young people increasingly prefer sectors offering predictable career paths and fixed monthly wages, thereby reinforcing agriculture's relative disadvantage in the rural labor market.

Access to land emerged as another critical structural constraint. The limited availability of agricultural land, driven by urbanization and land conversion, significantly reduces opportunities for youth to establish independent farming enterprises. From the perspective of agrarian structure theory, land scarcity not only restricts production capacity but also raises entry barriers for new farmers, particularly young individuals without inherited assets.

*"The challenges... range from limited land and high technology costs to weather uncertainty."* (Interview, February 6, 2025)

This condition corroborates the findings of Kubitza et al. (2018), who emphasize that declining land ownership in Indonesia undermines farmer regeneration. In this study, land scarcity interacts with high technology costs, reinforcing youth perceptions that agriculture requires substantial capital investment with uncertain returns, thereby intensifying disinterest.

In the specific context of Karanganyar, land access constraints are further compounded by a set of interrelated structural factors that distinguish the regency from other agricultural regions in Indonesia. First, rapid land conversion (*alih fungsi lahan*) driven by the expansion of industrial estates, residential developments, and road infrastructure has progressively reduced the availability of cultivable land. BPS Karanganyar data indicate a steady contraction in agricultural land area over the past decade, with conversion rates accelerating in peri-urban sub-districts such as Jaten and Colomadu. This physical reduction in arable land not only diminishes opportunities for young farmers to acquire productive plots but also elevates land prices beyond the financial reach of most youth entrants. Second, the rural labor market in Karanganyar is characterized by strong competition between the agricultural and manufacturing sectors. The presence of large-scale textile, garment, and automotive component factories in the

Greater Solo industrial belt offers youth relatively stable monthly wages, health insurance, and structured working hours—conditions that smallholder agriculture is structurally unable to match. This wage-employment pull effect effectively raises the reservation wage of young rural workers, making agriculture an economically irrational choice absent significant income support mechanisms. Third, land ownership patterns in Karanganyar reflect deeply entrenched agrarian structures in which landholdings are predominantly controlled by older farmers or absentee landowners. The inheritance-based land tenure system, combined with the absence of a functional young farmer land-access program at the regency level, means that most youth who wish to farm must rely on sharecropping (*bagi hasil*) or land-rental arrangements that typically yield narrow profit margins. This situation creates a structural lock-in effect: youth who attempt to enter agriculture face both high entry costs and limited income upside, reinforcing rational disengagement from the sector. Fourth, the broader agricultural transformation process underway in Karanganyar—characterized by a gradual shift from subsistence paddy cultivation toward higher-value horticultural and agribusiness activities—presents both opportunities and risks for young entrants.

While this transformation theoretically opens space for technology-intensive and market-oriented farming, the transition remains incomplete and unevenly distributed across sub-districts. Youth in areas where transformation is more advanced express greater interest and optimism, whereas those in sub-districts still dominated by traditional paddy farming tend to reproduce the negative perceptions documented throughout this study. Taken together, these local structural dynamics suggest that youth disengagement from agriculture in Karanganyar is not primarily an attitudinal problem amenable to communication campaigns, but a rational response to a rural economic environment that systematically disadvantages young agricultural entrants relative to alternative employment options.

Another important factor is the lack of accessible and targeted agricultural training. Although training programs exist, respondents perceive them as poorly disseminated and insufficiently aligned with the needs of young people. From a human capital perspective, inadequate training constrains youths' ability to adopt modern agricultural practices and weakens their confidence to enter the sector.

*"Sometimes training is conducted, but it is not well targeted or does not reach small villages."* (Interview, February 16, 2025)

This finding supports Geza et al. (2022), who argue that ineffective dissemination of agricultural programs results in low youth participation. In contrast, Adeyanju et al. (2021) demonstrate that technology-oriented and entrepreneurship-based training can significantly enhance youth engagement. This study extends the literature by showing that training relevance and accessibility—rather than mere program availability—determine its effectiveness.

Income instability is another decisive deterrent. Youth respondents consistently compare agriculture with formal employment that offers fixed salaries and predictable working hours. This comparison reflects the absence of effective income protection mechanisms in agriculture, such as price stabilization policies, crop insurance, and guaranteed markets.

*"At the factory, I have clear working hours and a fixed monthly salary."* (Interview, February 16, 2025)

Alizamir et al. (2019) similarly note that price volatility and the lack of safety nets reduce agriculture's attractiveness to younger workers. This suggests that without institutional interventions to reduce risk, agriculture will continue to lose competitiveness in attracting labor.

Beyond economic and structural constraints, social stigma also plays a significant role. Agriculture is often perceived as a low-status occupation, particularly among educated youth. This perception influences social identity and career aspirations, consistent with labor sociology theories that emphasize the importance of social recognition in occupational choice.

*"Many of my friends think working in the agricultural sector is unattractive and less prestigious."* (Interview, February 6, 2025)

Lee et al. (2023) confirm that agriculture's low social status remains a major barrier to youth engagement. However, the findings of this study also indicate that this stigma diminishes when agriculture is associated with technology, innovation, and entrepreneurship. Youth with agribusiness or technological backgrounds tend to reframe agriculture as a modern and profitable sector.

*"Agriculture can be a productive and modern sector."* (Interview, February 6, 2025)

This supports Chavas and Nauges (2020), who demonstrate that technological adoption enhances not only productivity but also sectoral attractiveness. Importantly, the findings suggest that technology reshapes social perceptions of agriculture, making it more compatible with youth aspirations.

Family and community support further influence youth decisions. Respondents from families with positive agricultural experiences exhibit stronger motivation to remain engaged in the sector. According to Sivini and Vitale (2023), strong social capital and successful role models facilitate agricultural regeneration – a pattern clearly reflected in this study.

Finally, government support programs – such as subsidies, training initiatives, and seed assistance – are perceived as potentially effective but unevenly implemented. When well targeted, such programs can reduce entry barriers and increase youth confidence in pursuing agriculture.

*"Subsidies... and training programs that are more accessible to young people."* (Interview, February 16, 2025)

Consistent with Ningsih et al. (2023), this study confirms that youth-oriented agricultural policies can stimulate participation. However, it also highlights that fragmented implementation and weak communication limit their overall impact.

Overall, this study demonstrates that youth interest in agriculture is determined by the interaction of economic rationality, structural constraints, social valuation, and institutional support. These findings reinforce existing literature while providing regional insights from Karanganyar, emphasizing that effective youth regeneration strategies must simultaneously address income risk, land access, skills development, and the social image of agriculture.

### **Effectiveness of Government Programs and Stakeholder Support**

The findings reveal that government programs intended to promote agricultural regeneration in Karanganyar have not yet achieved their expected outcomes, particularly in terms of attracting youth participation. Although various initiatives – such as training programs, subsidies, and credit schemes – have been implemented, their overall effectiveness remains limited due to institutional, informational, and structural

constraints. This indicates that the mere existence of policies is insufficient; instead, program design, accessibility, and alignment with the needs and aspirations of young people are crucial determinants of success.

One of the main weaknesses identified is the limited dissemination of information. Many respondents were unaware of existing programs or perceived them as distant and difficult to access. From a public policy perspective, this situation reflects a classic implementation gap, where policies fail not because of poorly formulated objectives, but due to weak communication channels and inadequate outreach mechanisms.

*"There are good programs, but most of them only scratch the surface."* (Interview, February 6, 2025)

This finding is consistent with Mulema et al. (2021), who argue that lack of awareness and bureaucratic complexity significantly reduce youth participation in agricultural programs. The present study strengthens this argument by demonstrating that even motivated young people may be excluded when information fails to reach rural communities effectively.

Another critical issue concerns access to agricultural technology. Respondents widely acknowledged that technological modernization could transform agriculture into a more attractive sector for young people. However, this potential has not been fully realized due to limited capital and the high cost of technology, particularly for smallholder farmers.

*"Technology can be a game changer... but if the equipment is expensive, young people without capital will still not be interested."* (Interview, February 14, 2025)

From the perspective of agricultural transformation theory, technology adoption depends heavily on complementary assets such as capital, skills, and institutional support. Similarly, Geza et al. (2021) found that access to capital and technology plays a significant role in shaping youth involvement in modern agriculture. The current findings highlight that without affordable financing mechanisms, technology-driven agriculture remains an abstract idea rather than a realistic opportunity for young people.

Financial support mechanisms are also perceived as fragmented. Although credit programs are available, respondents consider them difficult to access or poorly suited to young farmers who lack collateral. This condition reinforces risk aversion and discourages entrepreneurial entry into the agricultural sector.

*"There must be subsidies or low-interest loans to buy these tools."* (Interview, February 16, 2025)

Shuaibu and Nchake (2021) demonstrate that targeted credit schemes and technology subsidies can increase productivity and youth participation. In contrast, the present study suggests that generic credit programs fail to address the specific constraints faced by young farmers, particularly first-time entrants.

Beyond economic instruments, the branding and social image of agriculture emerged as an important policy dimension. Respondents emphasized that agriculture is still associated with low social prestige, which weakens policy efforts to attract educated youth. This finding aligns with labor market signaling theory, which suggests that occupational image influences career choices independently of income considerations.

*"Agriculture needs to be packaged as something more modern and cool."* (Interview, February 6, 2025)

In line with Chavas and Nauges (2020), this study shows that modernization narratives and technological framing can reshape youth perceptions of agriculture.

However, it also adds that such branding efforts must be supported by tangible opportunities; otherwise, they risk being perceived as merely symbolic rather than genuinely transformative.

The role of agricultural extension services also requires critical attention. Respondents noted that existing training programs are often not context-specific, poorly targeted, and fail to reach remote villages. From a human capital development perspective, ineffective extension services weaken knowledge transmission and limit technology adoption.

"Sometimes there are programs, but they are not well targeted." (Interview, February 16, 2025)

Boye et al. (2024) emphasize that community-based and participatory training models are more effective in engaging young people. The findings of this study confirm that top-down approaches are insufficient and that localized, youth-centered extension strategies are essential for achieving meaningful impact.

Importantly, the findings suggest that policy fragmentation significantly reduces overall effectiveness. Government agencies, financial institutions, extension services, and private stakeholders often operate in silos, resulting in disconnected and uncoordinated interventions. From a regional development perspective, such fragmentation undermines the creation of an integrated agricultural ecosystem capable of supporting youth entrepreneurship.

The limited effectiveness of government programs in Karanganyar must be interpreted against the backdrop of the regency's specific institutional and administrative landscape. At the regency level, the Karanganyar Department of Agriculture (*Dinas Pertanian*) has implemented several youth-targeted initiatives, including the national Millennial Farmer (*Petani Milenial*) program and various agribusiness training modules. However, the reach of these programs has been constrained by at least three locally specific factors. First, the administrative fragmentation between regency-level agricultural offices, sub-district extension posts (*Balai Penyuluhan Pertanian/BPP*), and village governments (*pemerintah desa*) creates coordination gaps that prevent program information from reaching target beneficiaries consistently. Second, the dominance of industrial employment in Karanganyar's local economy means that agricultural career promotion competes against highly visible and tangible employment alternatives, making abstract policy incentives—such as future land access or long-term subsidy promises—less persuasive to youth facing immediate livelihood decisions. Third, existing credit and financing programs are predominantly designed around collateral-based eligibility criteria that structurally exclude young, asset-poor farmers. In the absence of youth-specific financial instruments that recognize non-asset forms of eligibility—such as demonstrated farming knowledge, participation in training programs, or group-based guarantees—young people in Karanganyar remain effectively locked out of formal agricultural finance. These institutional dynamics, embedded in the regency's particular administrative culture and economic structure, explain why program effectiveness in Karanganyar falls below what might be expected based on national-level policy design alone, and why locally adaptive implementation strategies are essential for meaningful youth engagement.

Compared with previous studies, this research contributes localized evidence from Karanganyar, highlighting the interaction between policy design, institutional capacity, and youth perceptions. While earlier studies often focus on individual policy

instruments, this study demonstrates that policy coherence and coordination are essential for successful agricultural regeneration.

Overall, the findings indicate that improving the effectiveness of government programs requires a shift from isolated interventions toward an integrated strategy that combines accessible information, affordable technology, tailored financial support, effective extension services, and the transformation of agriculture's public image. Without such a comprehensive approach, efforts to attract young people to agriculture are likely to remain limited, posing a serious threat to the long-term sustainability of the agricultural sector in the region.

#### **4. Conclusion**

The findings reveal that youth perceptions of the agricultural sector in Karanganyar Regency remain predominantly negative, shaped by a complex interplay of economic rationality, structural constraints, and socio-cultural factors. Agriculture is widely viewed as labor-intensive, economically uncertain, and socially undervalued, particularly among young people from non-farming backgrounds. In contrast, youth with farming family backgrounds or agribusiness education tend to hold more positive perceptions, especially when modern technologies such as precision farming, digital platforms, and mechanization are accessible. Limited land access, inadequate capital, high technology costs, and weak dissemination of government programs further constrain youth participation in the sector.

Beyond their empirical value, the findings carry important theoretical implications. The study extends the occupational choice framework by demonstrating that youth decisions regarding agricultural participation are dynamically shaped by the interaction between risk perception, social identity, technological exposure, and institutional context—not merely by static income comparisons. The findings also refine theories of agricultural transformation by showing that modernization does not automatically generate youth re-engagement unless accompanied by inclusive access mechanisms covering land, finance, and skills. Furthermore, the study contributes to the literature on institutional complementarity by demonstrating that individual policy instruments produce limited impact when implemented in isolation, and that institutional coherence is a precondition for effective agricultural regeneration. In this regard, the Karanganyar case enriches socio-economic models of farmer regeneration by highlighting how local institutional architecture mediates the relationship between national policy design and youth behavioral outcomes at the grassroots level.

To accelerate agricultural regeneration, this study proposes five specific policy recommendations. First, youth-oriented financing schemes should replace collateral-based eligibility with alternative criteria such as training participation and farmer group membership, adapted through a dedicated KUR *Milenial Tani* sub-scheme. Second, a regency-level youth agricultural land bank should be established to provide young farmers with transparent access to idle land through formally registered lease arrangements, supported by a moratorium on agricultural land conversion in designated farming zones. Third, digital agriculture initiatives—including sensor-based irrigation, drone monitoring, and market information platforms—should be prioritized in high-youth-density sub-districts, complemented by digital agriculture modules embedded in vocational school curricula. Fourth, extension services should shift from top-down generalized approaches toward youth-centered, participatory models featuring peer-

learning forums and field demonstration plots managed by young farmers. Fifth, sustained public campaigns should reframe agriculture as a modern and dignified profession through social media platforms and collaboration with universities, youth organizations, and the Petani Milenial initiative localized to the Karanganyar context.

This study has limitations, including its qualitative design and small sample size, which restrict generalizability beyond Karanganyar Regency. Future research should employ mixed-method or quantitative approaches with broader regional coverage, as well as longitudinal designs to track how youth perceptions evolve in response to structural changes and policy interventions.

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