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Don't stop me now: ageing farmers and its impact on rice farming productivity

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Abstract

This study delves into the intricate relationship between farmer age and its influence on rice farming productivity, conducted in Sumpiuh District, Banyumas Regency. While conventional policies often associate higher productivity with younger farmers, the findings from this research challenge this assumption. According to field findings, older farmers demonstrate a higher average level of rice farming productivity. This counterintuitive phenomenon can be attributed to their extensive experience, deep knowledge of traditional practices, and unwavering commitment to rice farming. Hence, a balanced approach is required to leverage the strengths of different age groups, enhancing productivity, efficiency, and sustainability. Simultaneously, it is equally essential to prepare the younger generation to ensure the continuity of rice production, acknowledging the dynamic nature of agriculture, where a fusion of traditional wisdom and the innovation of the younger generation has the potential to cultivate a resilient and prosperous farming sector.

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Introduction

Indonesia's rural areas are characterized by the enduring presence of older farmers who are still actively engaged in agriculture (Anandita and Patria, 2016; Leavy and Hossain, 2014, Arvianti, et al, 2019). This unique demographic composition signifies the intersection of generational traditions and the economic realities that influence farming decisions. The farmers, often living in remote villages, have cultivated the land for decades and remain deeply connected to their agricultural heritage (Pretty, 2002; Rist, Feintrenie, Levang, 2010).

The reluctance of ageing farmers in Indonesia to retire is frequently underpinned by economic factors (Susilowati, 2016). These factors encompass a range of challenges, including limited retirement savings, the absence of alternative income sources, and economic insecurities that deter them from leaving the fields. Meert et al (2005) stated that the economic dynamics that keep these farmers engaged in agriculture are integral to understanding their continued presence. The ongoing participation of elderly farmers in agriculture is also due to the challenge of passing down the profession to younger generations (Arvianti et al., 2019). Young generation in rural areas tend to favor non-agricultural employment (Nugraha and Herawati, 2015). Consequently, the agricultural labor force is predominantly comprised of elderly or nearly elderly farmers.

The ageing of the farming population in Indonesia presents both opportunities and challenges for rice farming productivity. Older farmers bring a wealth of experience and traditional knowledge to their work, which can enhance agricultural practices (Carolan, 2018; Hettiarachchi, 2022). However, there are potential drawbacks, including resistance to adopting modern farming techniques and technologies, physical limitations, and potential labor shortages during peak agricultural seasons (Lensun, Mandei, Timban, 2019; Wubeneh and Sanders, 2006; Altalb, Filipek, Skowron, 2015). Understanding the nuances of how farmer age intersects with rice farming productivity is critical for addressing the multifaceted issues at hand.

Sumpiuh District, which is administratively located in Banyumas Regency, is one of the regions playing a significant role in rice production. However, when examining its demographic composition, the majority of rural rice farming activities are managed by elderly farmers. In the face of these complex dynamics, it is crucial to conduct research that delves into the reasons behind ageing farmers' reluctance to retire and the impact of their continued presence on rice farming productivity. By understanding the economic factors that drive these decisions and the challenges they pose, we can develop informed policies and interventions that promote sustainable and productive rice farming practices.

RESEARCH METHODS

The research was conducted in Sumpiuh District, Banyumas Regency, from April to September 2023. Sumpiuh District was chosen as the research location due to its significance as the primary rice-producing region in Banyumas Regency, considering aspects such as production, land area, and the number of farmers involved (BPS Banyumas Regency, 2023). Sampling in this study was carried out through purposive sampling. The respondents in this research were rice farmers, with a total of 50 respondents.

The data used in this research consists of both primary and secondary data. Primary data was obtained through interviews with rice farmers, covering socio-economic aspects and their rice farming activities. Meanwhile, secondary data was collected from various sources, including research findings, books, and reports published by relevant authorities.

To investigate whether the rice farming productivity of elderly farmers significantly differs from the sample mean, we conducted a one-sample t-test. The one-sample t-test is utilized to compare the sample mean with the assumed population value (Al-Kassab, 2022). The hypothesis is as follows:

- H_0: $\mu X_1 + \mu X_2 = 0$ which means there is no difference in rice farming productivity based on the age of farmers,
- H_a: $\mu X_1 + \mu X_2 \neq 0$ which means there is a difference in rice farming productivity based on the age of farmers.

where:

X_1: Age of rice farmers is ≥ 60 years,
X_2: Age of rice farmers is < 60 years.

Testing criteria:

- If the significance is < 0.05, H_0 is rejected, and H_a is accepted.
- If the significance is ≥ 0.05, H_0 is accepted, and H_a is rejected.

RESULT AND DISCUSSION

Characteristics of Respondent Farmers

The respondents in this study are rice farmers originating from two villages, namely Karanggedang and Selandaka. Both of these villages are administratively part of Sumpiuh District, Banyumas Regency. In terms of age, the majority (62 percent) of respondent farmers fall into the non-productive age category, which is over 60 years. The remaining 38 percent are classified as belonging to the productive age category. This categorization aligns with the guidelines set by the Ministry of Health of the Republic of Indonesia, where the age range of 20-59 years falls under the productive age category, while those above 60 years fall into the elderly age category (non-productive) (Ministry of Health, 2023)."

Meanwhile, with regard to their educational backgrounds, over half of the respondents had received only primary education. There were 20 percent of the respondents who admitted to not completing their primary education, and 38 percent of the respondents successfully completed primary education. Furthermore, 26 percent of the respondents had completed junior high school, and 6 percent were high school graduates. In terms of farming experience, 92 percent of the farmers in this study had more than 10 years of farming experience. This implies that they have sufficient experience and skills to manage rice farming.

In terms of land ownership, the majority of farmers in this study possess small plots of land. Approximately 55.56 percent of farmers cultivate land less than 0.5 hectares in size, with only 13.3 percent of farmers having land exceeding 1 hectare. Land plays a critical role in agricultural production, as the amount of land cultivated by farmers significantly influences their level of productivity. For a more comprehensive overview, please refer to Table 1 for the characteristics of respondent farmers in this study.

Table 1. The Characteristics of Respondent Farmers

No.	Description	Percentage (%)
1.	Age (years)	
	- 40-49	8,0
	- 50-59	30,0
	- >60	62,0
2.	Education	
	- Did not pass elementary school	20,0
	- Elementary School	38,0

No.	Description	Percentage (%)
	- Junior High School	26,0
	- Senior High School	12,0
	- Undergraduate	4,0
3.	Land ownership (ha)	
	- <0,50	55,6
	- 0,50-1	31,1
	- >1	13,3
4.	Farming Experience (years)	
	- 1-10 tahun	8,0
	- > 10 tahun	92,0

Rice Farming Productivity Based on the Age of Farmers

The age of farmers, among other factors, impacts rice farming productivity (Adedoyin, et al, 2016; Koirala, et al, 2016; Bello, et al, 2021). Farmer age influences several aspects of rice farming, including physical and health factors (Susanto, et al, 2017), technology adoption (Adam, et al, 2021; Adams, Jumpah and Caesar, 2021), as well as knowledge and experience (Istriningsih, et al, 2022; Burton, 2014; Anwarudin, et al, 2019). Regarding physical and health aspects, younger farmers typically enjoy certain advantages, such as increased physical strength and higher energy levels, allowing them to carry out physically demanding agricultural tasks, like planting and harvesting, more efficiently. In contrast, older farmers may experience physical decline, which can potentially limit their ability to perform the same tasks.

Conversely, age also affects farmers' capacity to adopt new agricultural technologies. Younger farmers tend to be more receptive to innovation and modern technology, as they are more inclined to adopt efficient, technology-based farming practices, leading to a notable enhancement in rice farming productivity. In contrast, older farmers may exhibit a predisposition toward conservatism and resistance to change, which can hinder the adoption of technology.

However, the experience and knowledge possessed by older farmers represent valuable assets in the field of agriculture. They frequently have years of farming experience and profound insights into traditional practices. This experience can assist them in comprehending crops and tackling emerging challenges. Nonetheless, the challenge lies in finding a balance between their experience and adapting to more modern farming practices.

In terms of rice farming productivity, the research findings indicate that older farmers exhibit higher levels of productivity compared to their relatively younger counterparts. Specifically, the average productivity of rice farming conducted by farmers aged over 60 years reached 4.14 tons/ha, whereas farmers under 60 years of age had an average productivity of 3.76 tons/ha. Moreover, the results of the one-sample t-test, presented in Table 2, highlight disparities in rice farming productivity concerning age. The one-sample t-test analysis reveals a significance value of 0.00 (<0.05), signifying distinctions in rice farming productivity related to age. On average, farmers aged ≥ 60 years demonstrate higher levels of rice farming productivity compared to those under 60 years of age.

Table 2. One-Sample t-Test Analysis Results of Rice Farming Productivity in Sumpiuh District, Banyumas Regency

	N	Mean	t-statistics	Significant
Productivity	50	-56,006	-99,906	0,000

Significant α: 0,05%

Numerous prior research findings have suggested that within the productive age range, farmers can effectively manage rice farming and make substantial contributions to the workforce (Yasa and Hadayani, 2017; Chidiebere-Mark, et al, 2019; Budiyoko et al., 2023;). However, the results of this study reveal a contrary trend. Despite no longer being in their youth or productive years, older farmers demonstrate a higher average level of productivity when compared to their younger counterparts. Several factors contribute to this phenomenon. Firstly, older farmers have accrued more farming experience than their younger counterparts (Williamson, 2017; Kusumo and Mukti, 2019.), which serves as an asset in rice farming management and enhances productivity. Secondly, older farmers tend to allocate a greater proportion of their time to focusing on rice farming (Putri, et al, 2019). Conversely, younger farmers are more inclined to engage in additional activities, both within and beyond farming.

In addition to these factors, farmers in the research area consider rice farming as the primary income source in their household income structure. Older farmers are reluctant or unable to discontinue their involvement in rice farming activities, as it constitutes their primary income source. Economic factors and the absence of alternative livelihood sources keep them active in their later years. Hence, a prudent approach is necessary to leverage the strengths of diverse age groups of farmers. This approach will enhance the productivity, efficiency, and sustainability of rice farming by combining the knowledge and abilities of different generations. Equally vital is the preparation of younger farmers to ensure the continuity of rice production in the future.

CONCLUSION

In the pursuit of understanding the intricate dynamics of rice farming productivity in relation to farmer age, our research has unveiled an important and somewhat unconventional finding. Contrary to conventional wisdom and some previous research, this study demonstrates that, in this context, older farmers exhibit higher levels of productivity than their younger counterparts.

This counterintuitive phenomenon could be attributed to several interrelated factors, including the experience, knowledge, and dedication of older farmers to rice farming, as it serves as the primary source of income for their households. Simultaneously, it becomes imperative to prepare the younger generation of farmers for a sustainable legacy, ensuring the continuity of rice production in the future. This underscores the dynamic nature of agriculture, where the synthesis of traditional wisdom and innovation from the younger generation has the potential to cultivate a more resilient and prosperous agricultural sector in the future.

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