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Farmers' Knowledge and Skills in Shallot Farming at Pucang Simo Village, Jombang Regency

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ABSTRACT
The ability of farmers to apply efficient and sustainable agricultural techniques depends critically on their knowledge and abilities. The purpose of this study was to evaluate shallot farmers' knowledge and abilities in Pucang Simo Village, Jombang, Indonesia. Thirty shallot farmers were chosen from a population of 150 farmers to participate in a descriptive quantitative study. Questionnaires, interviews, observations, and documentation were used to gather data.The research instrument was tested using Pearson's Product-Moment validity test and Cronbach's Alpha reliability test. Of the 30 questionnaire items, 23 were found to be valid (r-count > 0.374), while the instrument demonstrated high reliability with a Cronbach's Alpha coefficient of 0.915. Descriptive statistical analysis was used to determine the mean scores of farmers' knowledge and skills based on their educational level. The results showed that farmers generally possessed high levels of knowledge and skills across all educational groups. Mean knowledge scores ranged from 2.48 to 3.00, while mean skill scores ranged from 2.00 to 3.00 on a three-point Likert scale. Although most respondents had completed only elementary education, they demonstrated a high level of competence in implementing shallot farming practices. These findings suggest that practical farming experience and continuous learning may help strengthen farmers' competencies regardless of their formal educational background. The study provides useful insights for agricultural extension programs aimed at improving farmers' knowledge and technical skills to support sustainable shallot farming.

***Keywords**: farmers' knowledge;farmers' skills;shallot farming;agricultural extension;sustainable agriculture.*

INTRODUCTION

The agricultural sector is one of the main pillars of Indonesia's national economic development, contributing significantly to food security, employment, and rural welfare (Nadziroh, 2020). Among horticultural commodities, shallot (*Allium ascalonicum* L.) has an important economic value due to its continuous demand for household consumption and the food processing industry. In addition, shallot contains bioactive compounds such as flavonoids and allicin, which contribute to its antioxidant and functional properties (Major et al., 2022). Therefore, improving shallot production has become an important concern in supporting sustainable agricultural development.

Jombang Regency, East Java, is one of the potential areas for shallot cultivation. However, shallot production in this region continues to face several challenges, including pest and disease attacks, fluctuating productivity, and the need for improved cultivation practices (Istriningsih dkk., 2022). Achieving optimal productivity requires not only favorable environmental conditions but also farmers who possess adequate knowledge and practical skills in implementing recommended cultivation techniques.

Farmers' knowledge and skills are important determinants of successful shallot farming. Knowledge enables farmers to understand appropriate cultivation practices, while practical skills support the effective implementation of these practices in the field(Dewi dkk., 2024). Farmers with better knowledge and skills are generally more capable of adopting improved cultivation

technologies, increasing productivity, and minimizing production risks (Sondakh et al., 2021). Conversely, inadequate knowledge of cultivation techniques, inappropriate fertilizer application, and improper pest and disease management may reduce both crop yield and product quality (Zuriani et al., 2023; Budiarti et al., 2023).

Several previous studies have examined farmers' knowledge and skills in agricultural activities. Fadhilah et al. (2018) found that the application of agribusiness techniques greatly increased rice yield thanks to farmers' expertise.(istiningsih et al.,2022). discovered that the adoption of suggested growing methods was hampered by the shallot farmers' generally moderate levels of knowledge and expertise in Bima Regency. Likewise, Yuswandi et al. (2022) demonstrated that improvements in farmers' knowledge and skills were associated with increased agricultural productivity. Although these studies have highlighted the importance of farmers' competence, they were conducted in different agricultural commodities or regions. Empirical evidence regarding the knowledge and skills of shallot farmers in Pucang Simo Village, Jombang Regency, remains limited.

Pucang Anom Hamlet, located in Pucang Simo Village, is one of the centers of shallot cultivation in Jombang Regency. However, information regarding the current level of farmers' knowledge and skills in implementing shallot farming practices is still unavailable. Understanding farmers' competence is essential for identifying areas requiring improvement and for supporting agricultural extension programs. Therefore, this study aimed to analyze the levels of farmers' knowledge and skills in shallot farming based on their educational level in Pucang Anom Hamlet, Pucang Simo Village, Jombang Regency. The findings are expected to provide useful information for developing extension strategies and farmer capacity-building programs to support sustainable shallot farming.

METHOD

This study employed a descriptive quantitative approach to analyze the levels of farmers' knowledge and skills in shallot farming based on their educational level. The research was conducted in Pucang Anom Hamlet, Pucang Simo Village, Bandarkedungmulyo District, Jombang Regency, East Java, from November to December 2025.

The study population consisted of 150 shallot farmers. A total of 30 respondents were selected using purposive sampling based on the criteria that they were actively engaged in shallot farming during the study period and were willing to participate in the research.

Primary data were collected through questionnaires, interviews, observations, and documentation. The questionnaire consisted of 30 statements, including 15 items measuring farmers' knowledge and 15 items measuring farmers' skills related to land preparation, seed selection, planting, fertilization, irrigation, pest and disease management, and post-harvest handling. Responses were assessed using a three-point Likert scale, where 3 = know/able, 2 = less know/able, and 1 = do not know/able.

The research instrument was tested for validity using the Pearson Product-Moment correlation test and for reliability using Cronbach's Alpha coefficient. Questionnaire items with an r-count greater than the r-table value (0.374) at the 5% significance level were considered valid, while a Cronbach's Alpha coefficient greater than 0.60 indicated that the instrument was reliable (Matondang dkk., 2023).

Data were analyzed using descriptive statistics by calculating the mean scores of farmers' knowledge and skills for each educational level. The mean scores were classified into three categories: low (1.00–1.66), moderate (1.67–2.33), and high (2.34–3.00). The findings are presented in tables and interpreted by referring to relevant literature.

RESULT AND DISCUSSION

Findings are presented in two parts. The result section first describes respondents' educational background and the validity and reliability of the research instrument, followed by the mean scores of farmers' knowledge and skills. The discussion section then interprets these findings in relation to relevant theory and previous studies.

Result

The educational background of respondents was analyzed because formal education may influence

farmers' ability to understand and apply agricultural information. The distribution of respondents according to educational level is presented in Table 1.

Table 1 Educational Level of Shallot Farmers in Pucang Anom Hamlet

Edutional Level	Number Of Responden (n=30)	Percentage (%)
Elementary School (SD)	17	56,7%
Junio High School (SMP)	7	23,3%
Senior High School (SMA)	5	16,7%
Diploma(D1)	1	3%
Total	**20**	**100%**

Most respondents (56.7%) had completed only elementary school, indicating that the formal education level of shallot farmers in Pucang Anom Hamlet remains relatively low.

Before data collection, the questionnaire was tested for validity and reliability. Of the 30 questionnaire items, 23 met the validity criterion (r-count > 0.374), while 7 items were excluded because they did not meet the required value. Reliability testing of the 23 valid items produced a Cronbach's Alpha coefficient of 0.915, indicating excellent internal consistency and showing that the instrument was suitable for data collection (Haryoko et al., 2020).

Table 2 Validity and Reliability Test Results of the Research Instrument

Test	Result	Criterion	Interpretation
Validity (Pearson product-moment)	23 of 30 items valid	r-count > r-table (0.374)	Valid
Reliability (Cronbach's Alpha)	0.915	$\alpha \geq 0.60$	Highly reliable

Mean knowledge and skill scores were calculated for each educational group. The results are presented in Table 3.**Table 3** Mean Knowledge and Skill Scores of Shallot Farmers by Level of Education

Level of Education	Knowledge (Mean)	Skill (Mean)	Category
Elementary School (SD)	2.57	2.56	High
Junior High School (SMP)	2.57	2.00	Moderate-high
Senior High School (SMA)	2.48	2.48	High
Diploma (D1)	3.00	3.00	High

Table 3 shows that farmers generally possessed high levels of knowledge and skills regardless of their educational background. Mean knowledge scores ranged from 2.48 to 3.00, while mean skill scores ranged from 2.00 to 3.00 on a three-point Likert scale. Farmers with diploma education obtained the highest scores for both knowledge and skills. However, respondents with elementary education also demonstrated high competence, indicating that formal education alone may not fully explain farmers' ability to implement shallot farming practices.

In terms of cultivation activities, respondents showed the highest confidence in practical tasks such as land preparation, seed selection, planting, and harvesting. Slightly lower scores were observed for integrated pest management and the precise dosage of fertilizer and pesticide application, suggesting that these technical aspects still require further improvement through extension activities.

Discussion

The findings indicate that shallot farmers in Pucang Anom Hamlet generally possess high levels of knowledge regarding cultivation practices. This result is consistent with the view that knowledge is an important factor in farmers' ability to adopt and apply agricultural innovations effectively (Suratiyah, 2006). Adequate knowledge helps farmers understand proper land preparation, seed selection, fertilization, irrigation, and post-harvest handling, which are essential for maintaining productivity and crop quality. Similar findings were reported by Sondakh et al. (2021), who emphasized that improving farmers' knowledge contributes to greater efficiency in agricultural production.

The study also found that farmers' practical skills were generally categorized as high. This suggests that respondents were able to carry out the main stages of shallot cultivation effectively, including planting, fertilization, pest control, and harvesting. According to Nurmaida (Nurmaida dkk., 2023), agricultural skills are developed through repeated practice and direct involvement in farming activities. Dewijanti (2023) further explained that farmers who consistently apply good agricultural practices tend to develop stronger technical competence and better farming performance.

Compared with previous research, the present study shows a relatively higher level of farmers' competence. Muhtar (2018) reported that shallot farmers in Kara Village, Bima Regency, generally had moderate levels of knowledge and skills, which limited the adoption of recommended cultivation techniques. In contrast, farmers in Pucang Anom Hamlet were categorized as having high competence across most indicators. This difference may be related to the farmers' continuous involvement in shallot cultivation and the availability of agricultural information within the local farming community. The findings are also in line with istiningsih et al. (2022), who found that improvements in farmers' knowledge and skills were associated with better agricultural production outcomes.

From a practical perspective, the results suggest that agricultural extension programs in Pucang Anom Hamlet should focus on strengthening technical competencies that obtained relatively lower scores, particularly integrated pest management and the appropriate dosage of fertilizer and pesticide application. Field schools, demonstration plots, and farmer-to-farmer learning activities may help improve these specific competencies while maintaining the strong practical skills that farmers have already developed through daily farming experience.

CONCLUSIONS

This study concludes that shallot farmers in Pucang Anom Hamlet, Pucang Simo Village, generally possess high levels of knowledge and skills in implementing shallot farming practices, regardless of their educational background. Farmers with diploma-level education obtained the highest mean scores for both knowledge and skills; however, respondents with elementary education also demonstrated good competence in applying recommended cultivation practices. These findings indicate that formal education is not the only factor contributing to farmers' competence in shallot farming.

The results provide useful information for agricultural extension agencies and local governments in designing capacity-building programs to further improve farmers' technical knowledge and practical skills, particularly in integrated pest management and the appropriate use of fertilizers and pesticides. Future studies are recommended to examine other factors, such as farming experience, participation in extension programs, access to agricultural information, and technology adoption, using analytical methods that allow the relationships among these variables to be evaluated more comprehensively.

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