



Original Article

Advancing Agricultural Development Through Horticultural Extension Services

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Abstract:

Horticultural extension services in Bogor are instrumental in promoting agricultural development by enhancing the productivity and sustainability of local horticultural practices. This study emphasizes the empowerment of women farmer groups, known as Kelompok Wanita Tani (KWT), to improve horticultural production through targeted initiatives such as providing essential production facilities and enhancing the skills of farmers and extension officers. Data collection was conducted from July to September 2024, using questionnaires and surveys to assess the knowledge of KWT members before and after extension activities. The results indicated a significant increase in knowledge related to horticultural crop cultivation, with pre-test scores rising from 69% to 87% post-training, demonstrating a 17% improvement ($P < 0.01$). This improvement in knowledge and practices is a promising sign for the future of horticultural development. Correlation analysis revealed interesting relationships among agricultural knowledge, educational background, age, and agricultural experience. This research highlights the crucial role of extension services in disseminating knowledge and best practices, ultimately improving the livelihoods of farmers in Bogor and contributing to the local economy.



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Keywords: Horticultural Extension; KWT; Agricultural Development; Knowledge Improvement

Introduction

*H*orticultural extension services in Bogor play a crucial role in advancing agricultural development, particularly by improving the productivity and sustainability

of local horticultural practices. The distinct agricultural environment, together with well-executed extension programs, can enhance the livelihoods of farmers and significantly boost the local economy, which is vital for the prosperity of our community.

A key strategy for improving horticultural production in Bogor involves empowering women farmer groups, known as Kelompok Wanita Tani (KWT) ([Suwarnata et al., 2023](#)). According to Suwarnata et al. (2023), several initiatives have been implemented to increase the competitiveness of horticultural products among these KWT groups. These efforts include providing essential production facilities, enhancing the skills of both farmers and extension officers, and improving post-harvest processing and marketing capabilities ([Suwarnata et al., 2023](#)). Measures such as these are essential to address the challenges faced by farmers, including but not limited to access to markets, climate change, and pest management, and ensure the cultivation of high-value crops that meet market demands.

Agricultural extension services in Bogor play a key role in disseminating knowledge and promoting best practices among farmers ([Payumo et al., 2013](#)). These agricultural extension services facilitate access to critical resources and information, helping farmers succeed in horticultural production ([Payumo et al., 2013](#)).

The economic impact of horticulture in Bogor is substantial ([Suwarnata et al., 2021](#)). Suwarnata et al. (2021) found that horticultural farming within KWT generates significant income, demonstrating its potential to improve the livelihoods of local farmers. Their study shows that the average annual cash income for an area of 487 m² is approximately IDR 3,514,080.75, highlighting the economic viability of horticultural practices in Bogor ([Suwarnata et al., 2021](#)).

This research aims to implement horticultural practices for KWT groups, examine the relationship between agricultural knowledge and the characteristics of KWT members, and identify the improvement in their understanding following extension activities.

Methods

Time and Location

Data collection was conducted from July to September 2024 in the villages of Rawa Panjang and Mulyaharja, Bogor, West Java Province. There were two KWT groups during this experiment, one from Mulyaharja Village and one from Rawa Panjang Village with a total of 30 respondents.

Observation Method

Table 1. Topic questions

No.	Topic
1	Definition of horticultural cultivation
2	Types of horticultural plants
3	Examples of horticultural plants
4	Methods of horticultural cultivation
5	Benefits of horticultural cultivation

The data collection methods included questionnaires and surveys. Observations were carried out to gather direct data from the KWT. The survey consisted of questions related to horticultural cultivation knowledge (Table 1) and the characteristics of KWT farmers. The characteristics of the KWT farmers included age, years of farming experience, and education level. The education level was categorized into a 5-point scale,

with the highest education level ranked as the highest point on the scale.

Data Analysis

The knowledge level of KWT members for pre- and post-test was calculated using an equation in Formula 1. Knowledge of horticultural cultivation was assessed through a pre-test conducted before the extension activities and a post-test afterward. Both the pre-test and post-test, consisting of 5 questions (Table 1), were analyzed using a T-test with a significance level of $P = 0.05$.

$$\text{Pre- and Post Test} = (\text{Score obtain}) / (\text{Total Score}) \times 100\% \dots\dots (\text{Formula 1})$$

A Pearson correlation test was conducted to determine the relationship between horticultural cultivation knowledge and the characteristics of KWT members. Information on horticultural cultivation knowledge and the characteristics of KWT members was collected during the pre-test, and the Pearson correlation was analyzed with a significance level of $P = 0.05$.

Results

Implementation horticultural practices

The implementation of horticultural practices began with the participants (KWT members) completing a pre-test and presenting materials on horticultural cultivation, particularly vegetables, using visual aids as the extension medium. After completing the implementation, the KWT members were given a post-test to assess their understanding following the presentation.



Figure 1. Horticultural cultivation extension activities at KWT

Relationship between agricultural knowledge and the characteristics of KWT members

The correlation analysis reveals interesting relationships among knowledge related to agriculture, educational background, age, and agricultural experience (Table 2). A weak negative correlation of -0.12 between agriculture-related knowledge and educational

background suggests that higher educational attainment may not directly correlate with increased agricultural knowledge. In contrast, agriculture-related knowledge exhibits a weak positive correlation of 0.15 with age, indicating that older individuals may possess slightly more agricultural knowledge. Moreover, educational background has a weak to moderate negative correlation of -0.23 with age, suggesting that as age increases, the level of academic background tends to decrease or is less pronounced. Additionally, agricultural experience shows a weak positive correlation of 0.12 with knowledge related to agriculture, indicating that more experienced individuals tend to have slightly more excellent agricultural knowledge. Finally, agricultural experience correlates positively with age (0.20), suggesting that older individuals often have more agricultural experience, although this correlation is also weak.

Table 2. Pearson correlation among knowledge related to agriculture, educational background, age, and agricultural experience.

	Knowledge related to Agriculture	Education level	Age
Education level	-0.12		
Age	0.15	-0.23	
Farming Experience	0.12	-0.03	0.2

Identify the improvement in KWT knowledge after attending extension activities

The pre-test results recorded a percentage of 69%, whereas the post-test results increased to 87% (Figure 2). This reflects a significant enhancement in knowledge related to horticultural crop cultivation, showing a 17% increase ($P < 0.01$). This progress can be attributed to the active participation of members during the training sessions, as they attentively listened, took thorough notes on the material presented, and effectively implemented what was learned. Furthermore, the content provided was both engaging and aligned with the needs of KWT members from both villages.

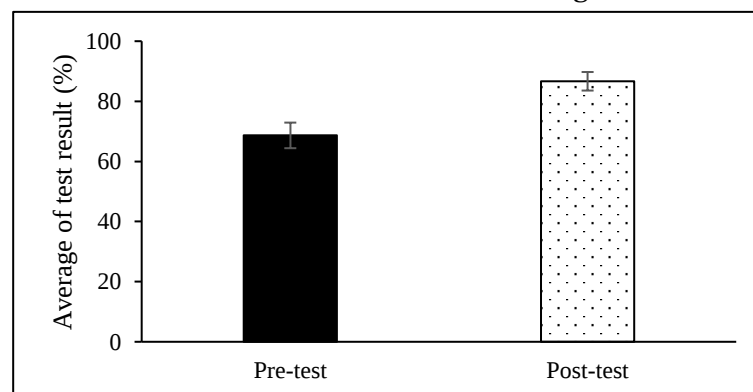


Figure 2. Percentage of knowledge in horticultural cultivation during in Pre-Test and Post-Test

Conclusion

The implementation of horticultural extension services in Bogor has proven essential for advancing agricultural development and enhancing the productivity of local horticultural practices, particularly through the empowerment of women farmer groups known as Kelompok Wanita Tani (KWT). By focusing on improving the skills of farmers and extension officers, as well as providing essential production facilities, these

services have effectively addressed the challenges faced by farmers and boosted their economic viability. The findings reveal a significant 17% increase in knowledge regarding horticultural crop cultivation among KWT members following extension activities. This increase is significant as it demonstrates the effectiveness of these training programs in enhancing the understanding and skills of the participants. The correlation analysis indicates a complex relationship between agricultural knowledge and factors such as age and educational background, suggesting that while educational attainment may not directly influence agricultural knowledge, experience and age play a more critical role.

Suggestion

It is suggested that horticultural extension services in Bogor prioritize continuous support for Kelompok Wanita Tani (KWT) groups to enhance agricultural productivity further. The study highlights a 17% improvement in horticultural knowledge following targeted extension activities, underscoring the importance of continuing training programs that address specific challenges women farmers face. Future initiatives should expand access to modern production facilities and provide advanced training on pest management, climate-resilient practices, and market access strategies. Moreover, the correlation between knowledge improvement and age or experience suggests that extension services should customize learning methods to accommodate different farmer demographics, ensuring that younger and more experienced farmers can benefit.

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