



## Optimization of Vacant Land Utilization through Moringa Cultivation and Moringa Tea Production as a Source of Food and Income for the Cilembang Community, Tasikmalaya

Rudi Priyadi<sup>1\*</sup>, Rina Nuryati<sup>2</sup>, Faqihuddin<sup>3</sup>, Ade Hilman Juhaeni<sup>4</sup>, Gilang Vaza Benatar<sup>5</sup>

<sup>1,4,5</sup> Program Studi Agroteknologi, Fakultas Pertanian, Universitas Siliwangi, Tasikmalaya

<sup>2,3</sup> Program Studi Agribisnis, Fakultas Pertanian, Universitas Siliwangi, Tasikmalaya

**Corresponding Author:** Rudi Priyadi [rudipriyadi@unsil.ac.id](mailto:rudipriyadi@unsil.ac.id)

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### ABSTRACT

The moringa plant, often called a miracle tree, has long been valued for its medicinal and industrial uses. This community service project aimed to educate students at the Murottalul Quran Al Muminun Islamic boarding school and residents of Cilembang about the benefits of moringa, focusing on its cultivation and processing into nutritious, high-value moringa tea. The program sought to improve health, boost local economies, and encourage better use of natural resources. Activities included training on moringa cultivation, tea production, and ongoing evaluation. The project aimed to optimize vacant land use, enhance community health, support environmental sustainability, and create new economic opportunities in Cilembang, Tasikmalaya.

## **INTRODUCTION**

Cilembang is a subdistrict located in the Cihideung District, Tasikmalaya City. According to the 2021 Village Development Report, Cilembang covers an area of 0.85 km<sup>2</sup>. It is bordered to the north by Argasari, to the east by Yudanegara and Nagarawangi, to the south by Nagarawangi, Tuguraja, and Linggajaya (Mangkubumi District), and to the west by Linggajaya (Mangkubumi District). Based on an initial survey, many households in Cilembang, particularly housewives, have unused yard space. Additionally, the Murottalul Quran Al Muminun Islamic boarding school has potential land that could be used for cultivating moringa. While moringa is commonly consumed as a vegetable, its numerous benefits are rarely known by the local community. A community service project concluded that cultivating moringa is an effort to optimize yard usage, transforming previously unused land into income-generating opportunities (Soejono et al., 2021; Ode et al. 2022; Puspitasari et al., 2023; ).

The economic value and benefits of moringa have led to increased interest in cultivating the plant, as every part—from the leaves to the bark, fruit, and seeds—offers remarkable advantages. Moringa has earned titles such as "The Miracle Tree," "Tree for Life," and "Amazing Tree" (Puja, 2021; Moedjiherwati et al., 2023). All parts of the moringa plant can be consumed by humans and animals, as well as used in various industries (Muhl et al., 2021; Wadu et al., 2021). Additionally, moringa has been identified as a source of medicinal ingredients and shows antimicrobial properties. It has been advocated as an excellent source of easily digestible protein, minerals, and vitamins to combat malnutrition in several countries (Leone et al., 2015; Arasyid et al., 2023).

Given the underutilized land, promising economic potential, and the health benefits of moringa, this presents an opportunity to develop moringa cultivation and moringa tea production as sustainable solutions. The lack of knowledge about processing moringa leaves into food products, their health benefits, and the low appeal of consuming moringa among the community highlight the opportunity to turn moringa into a source of food and income for the local population. This aligns with previous community service findings [10], which demonstrated that implementing such programs can result in high-value products that benefit both health and the economy. With a deep understanding of these issues, this community service initiative aimed to provide concrete and sustainable solutions to improve the welfare, health, and environmental sustainability of the Cilembang community in Tasikmalaya City.

## **IMPLEMENTATION AND METHODS**

This community service implementation and methods involved the application of science and technology to improve community welfare and environmental sustainability. In this context, science and technology were used to identify existing potentials and challenges, design appropriate and sustainable solutions, and implement programs that had a tangible positive impact on the community. In identifying potentials and challenges, science and technology were employed to conduct field surveys, data analysis, and literature reviews to gain a comprehensive understanding of the region's conditions.

Next, in designing solutions, science and technology were used to develop effective and environmentally friendly moringa cultivation methods and to design training and mentoring programs that met the needs of the local community. In program implementation, science and technology provided raw materials, production technology, and processing methods to enhance production and increase the value of moringa and moringa tea products. For monitoring and evaluation, science and technology were used to systematically measure the program's impact, allowing for continuous improvement and program development. Thus, science and technology played a crucial role at every stage of the community service activity, with the primary goal of providing innovative, effective, and sustainable solutions for the community and environment in Cilembang, Tasikmalaya City.

The implementation method for this community service activity included the following steps as can be seen in Figure 1.



**Figure 1. The implementation method for this community service activity**

Through this method, the community service activities were expected to provide maximum benefits for the community and environment in Cilembang, Tasikmalaya.

## RESULTS AND DISCUSSION

### Overview of community service partners

The partner region's challenges in the community service activities in Cilembang Sub-district, Tasikmalaya City, encompassed several critical aspects that demanded attention (see Figure 2). Primarily, the low level of welfare among the local community was driven by limited job opportunities and unstable income. Furthermore, the lack of diversification in income sources resulted in a heavy reliance on the agricultural sector, which had not been fully developed. Compounding these issues, the poor quality of food consumed by the community raised concerns, especially considering the importance of adequate nutrition for optimal health and growth. Recognizing these challenges, the community service activities aimed to make a meaningful contribution to enhancing the welfare and food security of the Cilembang community, particularly benefiting the students of the Murottalul Quran Al Muminun Islamic boarding school and the Nurul Iman PKK members.



**Figure 2. Condition of the Islamic Boarding School Land and One of the Residents' Yards**

To tackle these problems, several solutions were proposed within the framework of the community service initiatives. The first approach involved providing training and support to the students and mothers on effective and sustainable Moringa cultivation techniques, with the goal of improving both the production and quality of the Moringa harvest. The second solution focused on assisting in the development of Moringa-based products, such as Moringa tea, which offer added value and broader market potential. By diversifying income sources and increasing the economic value of Moringa products, these efforts could help reduce the community's dependency on traditional agriculture. Additionally, implementing a targeted marketing strategy would be essential to expanding the market reach for these Moringa products. Overall, this community service project was expected to have a significant positive impact on both the welfare of the local population and the environmental sustainability of the Cilembang Sub-district, Tasikmalaya City.

Community participation is often cited as a fundamental element of empowerment. emphasize that while community participation can lead to positive outcomes, it is crucial to define and measure empowerment robustly to avoid conflating it with mere bureaucratic processes (Haldane et al., 2019). This sentiment is echoed in the work of , who critiques top-down approaches to community development, advocating instead for the inclusion of local voices in decision-making processes (Mendes, 2019). Such participatory frameworks not only enhance community agency but also ensure that empowerment initiatives are tailored to the specific needs and contexts of the community.

Moreover, the integration of technology in community empowerment strategies has been shown to yield significant benefits. discusses how digital-based empowerment initiatives can improve the quality of life by providing training and resources to Micro, Small, and Medium Enterprises (MSMEs) (Wardhana, 2022). This aligns with the findings of , who notes that competency development among community members is vital for holistic empowerment that addresses economic, social, educational, and health dimensions (Krishernawan, 2024). The use of technology thus serves as a catalyst for fostering community engagement and enhancing the effectiveness of empowerment programs.

### **Moringa business analysis counseling**

The counseling activity on the business analysis of moringa aimed to provide understanding to the community or potential entrepreneurs about the economic potential of the moringa plant. In this counseling session, participants were equipped with information regarding business analysis covering capital calculation, production cost estimation, profit potential, and marketing strategies for moringa products, whether in the form of fresh leaves, powder, or other processed products.



**Figure 3. The Counseling Activity on the Business Analysis of Moringa Delivered By Agribusiness Expert**

The participants of this counseling consisted of students of the Murottalul Quran Al Muminun Islamic boarding school and members of the Nurul Iman PKK. Before attending the counseling, most participants had limited knowledge about moringa cultivation and its economic potential. They might not have been aware of how moringa could be turned into a profitable and sustainable commodity. However, after attending the counseling, participants were expected to have broader insights, understand proper cultivation techniques, be able to create solid business plans, and know how to optimize the marketing of moringa products. This counseling (Figure 3) was expected to bring positive changes, not only in participants' knowledge but also in their motivation to start and develop a moringa business professionally.

The creation of businesses within communities can significantly contribute to positive change, particularly when these enterprises are rooted in social entrepreneurship. Social entrepreneurship serves as a catalyst for community development by addressing pressing social issues while simultaneously fostering economic growth. Research indicates that social entrepreneurs are often seen as agents of change, capable of providing innovative solutions to societal challenges, thus enhancing community welfare and promoting sustainable practices (Iskandar, 2023; Bansal et al., 2019).

### Extension and training on moringa cultivation and its processed products

The counseling on moringa cultivation techniques aimed to provide participants with an in-depth understanding of how to plant and care for moringa plants properly to achieve optimal and high-quality results. This activity covered various essential aspects of moringa cultivation, including selecting superior seeds, preparing the land, and the techniques of planting and maintaining the plants. Participants were taught how to choose quality moringa seeds, including identifying healthy seeds and assessing their growth potential (Figure 4a). They learned about the ideal land preparation for moringa cultivation, including soil processing, initial fertilization, and proper planting spacing.

During the planting phase, participants were informed about efficient planting techniques, such as the correct depth of planting holes, the spacing between plants, and proper planting methods to ensure good growth. Additionally, they were educated on plant maintenance, including adequate watering, pest and disease control, and necessary pruning techniques to maintain plant health



**Figure 4. Training and Outreach on Moringa Cultivation Techniques (a, d) and Its Derived Products (b, c).**

The counseling and training also included guidance on ongoing plant care during growth, such as additional fertilization and handling potential issues. By participating in this counseling and training, participants were expected to apply the correct cultivation techniques, produce high-quality moringa plants, and maximize their harvest for optimal benefits. The training also extended to teaching participants how to produce processed moringa products, specifically moringa tea and chips (Figure 4b-c). The community learned how to harvest and prepare moringa leaves for tea production, including the proper drying methods to preserve nutrients and flavor. Participants were also trained in the process of turning moringa leaves into chips, focusing on preparation, seasoning, and frying techniques to create a nutritious and marketable product. This hands-on training aimed to equip the community with the skills needed to diversify their moringa-based products, adding value and opening new economic opportunities for local entrepreneurs.

One of the key benefits of hands-on training is the improvement of collaborative skills among participants. For instance, emphasizes that through structured activities like Lesson Study, students can enhance their collaboration, literacy, and critical thinking skills in science learning, thereby creating a more engaged learning community (Marhamah, 2023). Similarly, highlight that dyad practice in medical education allows students to share cognitive loads, which not only reduces the risk of cognitive overload but also fosters social and psychological benefits, reinforcing a sense of community among learners (Tolsgaard et al., 2014). This is echoed by , who notes that practical training in nursing promotes interprofessional collaboration, which is crucial for effective healthcare delivery and community building among medical professionals (Igarashi, 2023).

## **CONCLUSIONS AND RECOMMENDATIONS**

In conclusion, the community service activities in Cilembang Sub-district, Tasikmalaya City, addressed critical challenges faced by the local population, including limited job opportunities, reliance on undeveloped agriculture, and poor nutrition. By providing comprehensive training on sustainable moringa cultivation and the development of value-added moringa products such as tea and chips, these initiatives empowered the community with practical skills and knowledge to diversify income sources and improve food security. The counseling on business analysis further supported participants in understanding the economic potential of moringa, enabling them to create profitable and sustainable enterprises. Ultimately, these efforts contributed to enhancing the welfare and environmental sustainability of the region.

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