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Optimization of the Use of Organic Fertilizer in Urban Farming to Improve Agricultural Yield in Ubung Village

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ABSTRACT

Urban farming has emerged as a vital solution to address challenges such as limited land availability, population growth, and rising food demands in urban areas. This community service program aimed to enhance agricultural productivity and sustainability through the effective use of organic fertilizers. The program focused on educating and empowering the Jelita Women Farmers Group (KWT) and the broader community in Ubung Village, providing hands-on training in organic fertilizer management and sustainable farming practices. Over one-week implementation period, the program included workshops, practical demonstrations, and the distribution of agricultural resources such as seeds, organic fertilizers, and tools. A comprehensive 30-day evaluation phase assessed the program's impact, revealing significant improvements in soil fertility, crop yields, and community participation. Crops such as vegetables, chilies, melons, and Family Medicinal Plants (TOGA) showed markedly better harvest results compared to pre-training levels. This program also fostered greater awareness of sustainable agriculture and organic waste management, encouraging environmentally friendly practices. These outcomes highlight the program's success in addressing key challenges and its potential to serve as a model for sustainable urban farming initiatives in other regions.

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INTRODUCTION

Urban farming has emerged as a highly relevant solution to address various challenges in urban areas, including limited land availability, population growth, and increasing food demands. By utilizing narrow spaces such as yards, rooftops, and vacant land, urban farming enables the production of sustainable agricultural products. This practice not only empowers urban communities to produce food independently but also contributes to local food security (Widada et al., 2017). Furthermore, urban farming fosters social cohesion by promoting friendship, cooperation, and mutual assistance within heterogeneous communities. A critical factor in the success of urban farming is the use of appropriate fertilizers, with organic fertilizers being the preferred choice due to their environmental friendliness and ability to support the sustainability of agricultural ecosystems.

Organic fertilizers, derived from natural materials such as plant residues, kitchen waste, and animal manure, are decomposed through biological processes. According to Saeri and Rahman (2020) organic

fertilizers enhance soil structure, improve the soil's capacity to retain water and nutrients, and enrich the presence of beneficial microorganisms. In the context of urban farming in Ubung Village, optimizing the use of organic fertilizers is a strategic approach to increasing agricultural output, particularly given the need for environmentally friendly and efficient methods on limited land.

The use of organic fertilizers in urban farming has demonstrated significant positive impacts on both the environment and agricultural sustainability. Research has shown that organic fertilizers improve soil quality and crop yields, especially in small-scale urban farming settings. As public awareness of the importance of organic agricultural products grows, the demand for environmentally friendly fertilizers has also increased (Gaina et al., 2021). Therefore, efforts to optimize the use of organic fertilizers are both relevant and strategic for enhancing agricultural productivity in Ubung Village.

Urban farming has become a vital solution in urban areas, addressing challenges such as limited land and rising food demands. According to Salleh et al. (2020), urban farming not only enhances food security but also reduces the carbon footprint by utilizing vacant urban land. In Ubung Village, the potential for urban farming is substantial, as there remains significant underutilized land that can be transformed into productive agricultural spaces.

Ubung Sub-district, located in North Denpasar District, Denpasar City, comprises four areas: (1) Sedana Mertha, (2) Tengah, (3) Sari, and (4) Batur. With a total area of 173 hectares, Ubung Sub-district has considerable potential to utilize vacant land to support community food security. As part of an urban area, Ubung Village faces challenges such as limited land and increasing food needs. Urban farming has emerged as a sustainable solution to maximize the use of narrow land. The village has implemented the Jelita Women Farmers Group (KWT) program, led by Pemberdayaan Kesejahteraan Keluarga (PKK), known as Pekarangan Pangan Lestari (P2L). This initiative focuses on utilizing green land adjacent to the river, which is unsuitable for housing construction, for agricultural purposes and seed cultivation (Abror et al., 2022).

The Jelita Women Farmers Group (KWT) was formally established under Ubung Village Decree No. 33/Kel.Ubung/22, dated June 4, 2022. The program has shown initial success in converting organic waste into fertilizer, highlighting the importance of government support for the sustainability of urban farming initiatives. Policies that provide land, training, and financial assistance are critical to the expansion and success of such programs (Rusliyadi et al., 2019).

The Community Service Program in Ubung Village has provided training to residents on converting organic waste into fertilizer for urban farming. One of the program's objectives is the increased awareness among the community regarding the importance of sustainable agriculture. Observations indicate that soil treated with organic fertilizer exhibits improved fertility, leading to higher yields of crops. However, optimizing the use of organic fertilizer remains a challenge that requires further attention to enhance local agricultural productivity. Additionally, the participation of members of the Jelita Women Farmers Group (KWT) in program management has been limited, necessitating greater engagement.

Through the training provided, members of the KWT have become more actively involved in urban farming activities. The program has also encouraged community participation in reducing household organic waste and transforming it into raw materials for organic fertilizer. This initiative aligns with government policies supporting sustainable agriculture in urban areas (Schreer & Padmanabhan, 2020). Beyond environmental benefits, the optimization of organic fertilizers has economic implications. Increased harvests create opportunities for residents to sell local agricultural products, thereby boosting household income. The local government has supported this development by providing agricultural facilities and advanced training.

Based on this background, to support the development of Sustainable Food Yards (P2L), through this Community Service Program, the author took the title "Optimizing the Use of Organic Fertilizers in Urban Farming to Increase Agricultural Results in Ubung Village". This Work Program aims to provide solutions to the problems faced by the Jelita Women Farmers Group (KWT), in improving the quality of Urban Farming through the development of green land for Sustainable Food Yards (P2L). By providing support in the form of agricultural fertilizers, this Work Program is then expected to have a positive impact on improving the quality of harvest results, empowering communities in improving farming skills, preserving the environment, and helping communities increase income through the sale of harvest results (Suswadi et al., 2020).

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METHOD

This community service program focuses on education, implementation, and optimization of the use of organic fertilizers in urban farming in Ubung Village. The program aims to empower the community by providing mentoring in organic fertilizer management, planning urban farming systems, and evaluating harvest results. The implementation of the program spans one week, from January 20, 2025, to January 27, 2025, with the primary location being the urban farming land managed by the Jelita Women's Farmers Group (KWT) in Ubung Village.

The program is structured into three main stages: preparation, implementation, and evaluation. Each stage is designed to ensure the effective transfer of knowledge, practical application, and assessment of outcomes:

1. Preparation

The preparation phase involved direct observation and planning to identify existing challenges and opportunities in the Sustainable Food Yard (P2L).

Figure 1. Conducting Direct Observations at the Sustainable Food Yard (P2L)

The observation aimed to assess the current state of the P2L, particularly in relation to the use of state-owned empty land managed by the Jelita Women Farmers Group (KWT). Key issues identified included the need for improved organic fertilizer management and the optimization of land use for sustainable agriculture.

Following the observation, agricultural materials were procured to support the program.

Figure 2. Purchasing Agricultural Materials at Beringkit Market

Materials such as seedlings, TOGA plants (Family Medicinal Plants), organic fertilizers, insecticides, and paranets for hydroponics were purchased at Beringkit Market. These materials were subsequently handed over to the Jelita Women Farmers Group (KWT) to facilitate the implementation of urban farming activities.

2. Implementation

The implementation phase was conducted on Monday, January 20, 2025, from 09:00 to 12:00 WITA, at the Sustainable Food Yard (P2L) in Ubung Village. The activity was carried out under the supervision of the Head of Kesra (People's Welfare), the Head of PKK (Family Welfare Empowerment), and members of the Jelita KWT.

The program included workshops focused on organic fertilizer management, urban farming techniques, and sustainable agricultural practices. These workshops were designed to provide participants with both theoretical knowledge and practical skills. Participants were guided in applying organic fertilizers and planting seedlings, ensuring they could directly implement the techniques learned. To support the community's farming activities, seedlings, TOGA plants (Family Medicinal Plants), organic fertilizers, insecticides, and paranets (for hydroponic systems) were distributed. These materials were essential for enabling participants to start or enhance their urban farming projects.

The implementation phase aimed to provide immediate benefits to the community, including improved agricultural productivity through the use of organic fertilizers and optimized farming techniques, as well as enhanced knowledge of sustainable practices, empowering participants to adopt environmentally friendly methods in their farming activities.

3. Evaluation

To ensure the effectiveness of the program, a comprehensive evaluation was conducted over 30 days, extending beyond the initial implementation week. The evaluation included regular follow-up mentoring sessions with members of the Jelita Women Farmers Group to monitor progress and address challenges, structured interviews with participants to assess the impact of the program on their farming practices and community engagement, and an analysis of crop yields and soil quality to measure the effectiveness of organic fertilizer use. This evaluation phase provided valuable insights into the program's outcomes, including increased community participation, improved agricultural yields, and enhanced awareness of sustainable farming practices.

RESULTS

The community service program through "Optimizing the Use of Organic Fertilizer in Urban Farming in Ubung Village" has had a significant and transformative impact on the local community, particularly the members of the Jelita Women's Farmers Group (KWT). Through this program, the community not only gained theoretical knowledge about the importance of organic fertilizers but also engaged in hands-on practice in their application within the Sustainable Food Yard (P2L). The sustainable use of organic fertilizers has demonstrated a measurable improvement in soil fertility on the KWT Jelita land. This aligns with recent research findings, which highlight that the consistent application of organic fertilizers enhances soil fertility, water retention, and microbial activity, ultimately leading to increased agricultural yields in urban environments (Saeri & Rahman, 2020). The community has begun to embrace the principles of environmentally friendly agriculture and recognize the benefits of converting organic waste into valuable fertilizer.

Figure 3. Group Photo of the Implementation of the Urban Farming Work Program

The primary goal of this program was to empower the community, especially the Jelita Women Farmers Group (KWT), to understand how organic fertilizers can enhance crop yields in urban areas like Ubung Village.

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Additionally, the program aimed to identify optimal strategies for applying organic fertilizers to achieve the best results. It is hoped that the members of KWT Jelita will continue to actively participate in agricultural activities, benefiting both the community and the environment in Ubung Village.

Figure 4. Implementation of Providing Seeds and Fertilizer to KWT Jelita

The program has successfully increased soil fertility and improved the yields of various crops, including vegetables, chilies, melons, and Family Medicinal Plants (TOGA). The participation of KWT Jelita members in urban farming management has also risen significantly following the training and provision of agricultural resources, such as organic fertilizers and plant seeds. Another notable outcome is the heightened awareness among community members about the importance of sustainable agriculture and organic waste management in reducing environmental pollution. The program has also garnered increased attention from the local government, which has responded with supportive policies and additional assistance (Darwis, 2017).

With these optimizations, Ubung Village is poised to become a model for independent and sustainable urban farming, contributing to enhanced food security in urban areas. The anticipated results of this work program are summarized in the table below:

Table 1 Community Service Results

No	Before There is a Training	After There is a Training
1	Lack of public knowledge about the techniques of using organic fertilizer efficiently in urban farming.	The community gains knowledge about the use of organic fertilizers and the practice of managing organic waste into fertilizers. This increases awareness of sustainable agriculture.
2	The participation of KWT Jelita members in agricultural activities is very low due to the lack of training on urban farming.	Members of KWT Jelita become more active in urban farming activities after receiving training, assistance with seeds, and agricultural tools.
3	Plants such as chili, melon, vegetables, and Family Medicinal Plants (TOGA) show inconsistent or low yields.	Plants such as chili, melon, vegetables, and Family Medicinal Plants (TOGA) show significantly better harvest results compared to before the training.

The work program has yielded several critical outputs that have positively impacted the local community. The community has developed a deeper understanding of organic fertilizer management and its application in the Sustainable Food Yard (P2L). Through training and direct assistance, community members are now adept at converting organic waste into effective fertilizers, improving soil fertility and crop quality. The application of organic fertilizers has led to higher productivity and better-quality harvests, particularly for vegetables, chilies, melons, and Family Medicinal Plants (TOGA). Members of the Jelita Women's Farmers Group (KWT), who were previously less active in agricultural activities, are now more engaged and involved after receiving education and resources such as seeds and organic fertilizers (Wijayanto et al., 2019). Additionally, the program has attracted increased attention and support from the local government, which has provided additional assistance and implemented policies to encourage the development of urban farming in the area.

CONCLUSION

This community service program titled has successfully addressed key challenges in urban agriculture, fostering sustainable practices and community empowerment. By focusing on education, implementation, and evaluation, the program has significantly enhanced the knowledge and skills of the Jelita Women's Farmers Group (KWT) and the broader community in managing organic fertilizers and applying them effectively in the Sustainable Food Yard (P2L).

The program has demonstrated measurable improvements in soil fertility, water retention, and microbial activity, leading to increased agricultural yields for crops such as vegetables, chilies, melons, and Family Medicinal Plants (TOGA). These outcomes align with research findings that highlight the benefits of organic fertilizers in urban farming environments. Additionally, the program has successfully increased the participation of KWT Jelita members in agricultural activities, transforming them from passive observers to active contributors in urban farming.

Another significant achievement is the heightened awareness among community members about the importance of sustainable agriculture and organic waste management. This has not only reduced environmental pollution but also encouraged the adoption of environmentally friendly practices. The program has also garnered increased attention and support from the local government, which has responded with additional assistance and policies to promote the development of urban farming in Ubung Village. The program's success underscores the importance of community engagement, education, and government support in achieving sustainable agricultural practices. Moving forward, it is hoped that the lessons learned and the positive outcomes of this program will inspire similar initiatives in other urban areas, fostering a broader movement toward sustainable and resilient urban agriculture.

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