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Transformation of Household Waste: Effective Ways to Convert It into Liquid Organic Fertilizer

Ahmad Rizal Fikri[1*], Iqbal Imam Taufiq[2], Catelia Rifqi Lestari[3], Irma Juliana[4], Muhammad Azkiyak[5], Lathif Hanafir Rifqi[6]
[1-6] Walisongo State Islamic University Semarang, Central Java, Indonesia
2102016138@student.walisongo.ac.id [1*]

Address: Jl. Walisongo No.3-5, Tambakaji, Kec. Ngaliyan, Semarang City, Central Java 50185
Author correspondence: 2102016138@student.walisongo.ac.id

Abstract: *Household waste, although a significant environmental challenge, has the potential to be converted into valuable resources. This article discusses effective methods for transforming household waste into Liquid Organic Fertilizer (LOF), an environmentally friendly solution that improves soil quality and supports plant growth. By utilizing materials such as food scraps, fruit peels, and dry leaves, this process not only reduces the volume of waste sent to landfills but also benefits home gardening. The article outlines practical methods for producing LOF, including simple fermentation techniques, necessary equipment, and a step-by-step guide. It also discusses the ecological and economic benefits of using household waste as LOF and its impact on sustainability and waste management. With comprehensive and easy-to-follow information, this article aims to encourage individuals and communities to adopt these practices as part of their waste management and sustainable agriculture efforts.*

Keywords: *Organic waste, LOF, waste management, household waste*

1. BACKGROUND

The rapid growth of the global population is directly related to an increase in waste production, especially household waste. Organic waste from food scraps, fruit peels, and leaves is a major contributor to waste volume. Improper disposal of organic waste not only pollutes the environment but also releases methane gas, which contributes to global warming. Effective waste management is crucial for maintaining environmental cleanliness and public health. Household waste, including food scraps, fallen leaves, and other organic materials, is often discarded without proper processing, leading to soil and water pollution and hindering the recycling of organic materials. Inefficient waste disposal can cause serious environmental issues, including soil, air, and water pollution.

An innovative solution for managing organic waste is to convert it into Liquid Organic Fertilizer (LOF). LOF is a product made through the fermentation of organic materials such as food scraps and plant residues. Using household waste for LOF production not only reduces the amount of waste that needs to be discarded but also results in a nutrient-rich fertilizer that enhances soil fertility and plant health. Additionally, LOF boosts soil microorganism activity, which is crucial for organic matter decomposition. This technology supports the circular economy principle, which views waste as a valuable resource. The process of making LOF from household waste involves several stages: collecting raw materials, fermentation, and

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maturation. The result is an environmentally friendly fertilizer rich in nutrients and beneficial microorganisms for plants.

2. METHODS

Community service activities were conducted in Banteng Village, Batang Regency, Central Java in July 2024. The methods employed included providing material on the utilization of household waste and demonstrating fertilizer production. Participants, particularly PKK (Family Welfare Program) members and farmer groups, received training on how to process household waste into LOF and were introduced to the necessary tools and materials. The training aimed to provide solutions for managing household waste in Banteng Village and address their waste management issues. This program, part of the KKN (Community Service Program) Group 70 at Walisongo State Islamic University Semarang, was based on observations and discussions with village officials. The education is expected to be implemented in daily life and enhance environmental awareness among the community.

3. RESULTS AND DISCUSSION

The community service activities in Banteng Village highlighted that residents had limited understanding of how to process household waste into fertilizer. However, the training provided valuable insights to the community, especially farmers with extensive land. The educational process covered the negative impacts of household waste, the importance of waste processing, and the benefits of LOF. Waste can be categorized into four types: liquid, solid, gas, and noise waste. Liquid waste includes domestic and industrial waste, while solid waste is divided into organic and inorganic. Household waste management is often neglected due to the low awareness of waste segregation among the public. This results in waste accumulation, decay, and odor problems.

Effective organic waste management involves transforming waste into LOF. LOF offers various benefits, such as reducing waste, improving soil quality, and increasing plant productivity. The LOF production process includes waste collection, fermentation, and filtration. Utilizing LOF also reduces fertilizer costs and supports sustainable agriculture. Challenges in utilizing household waste for LOF include controlling the fermentation process, varying quality of raw materials, and public acceptance. Solutions involve monitoring fermentation conditions, selecting homogeneous raw materials, and providing education and training to improve adoption.

4. CONCLUSION

The community service in Banteng Village provided valuable knowledge and skills on processing organic household waste into liquid organic fertilizer. The community is expected to be more environmentally conscious and segregate organic from inorganic waste. This activity not only offers short-term benefits but can also be implemented in other locations under different conditions.

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