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Enhancing Organic Waste Management Through Simple Composting in Kemanisan Village

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Abstrak

Permasalahan sampah organik yang tidak terkelola dengan baik dapat menimbulkan dampak negatif terhadap lingkungan dan kesehatan masyarakat. Di lingkungan Sarongge, Kelurahan Kemanisan, masih ditemukan praktik pembuangan sampah organik secara langsung tanpa proses pengolahan lanjutan. Kegiatan ini bertujuan untuk mengoptimalkan pengelolaan sampah organik melalui sosialisasi dan pelatihan pembuatan pupuk cair dan padat dengan menggunakan komposter sederhana. Metode yang digunakan meliputi pendekatan partisipatif, penyuluhan, demonstrasi teknis, serta pendampingan langsung kepada warga. Hasil kegiatan menunjukkan peningkatan pemahaman dan keterampilan warga dalam mengelola sampah organik menjadi produk yang bermanfaat, seperti pupuk organik yang dapat digunakan untuk pertanian rumah tangga. Kegiatan ini diharapkan mampu menciptakan kesadaran lingkungan dan mendorong kemandirian masyarakat dalam pengelolaan sampah berkelanjutan.
Kata Kunci: Sampah Organik, Pupuk Cair, Pupuk Padat, Komposter Sederhana, Pengelolaan Lingkungan

Abstract

The mismanagement of organic waste can lead to negative impacts on both the environment and public health. In the Sarongge area, Kemanisan Subdistrict, improper disposal of organic waste without further processing is still commonly practiced. This activity aims to optimize organic waste management through socialization and training on the production of liquid and solid fertilizers using simple composters. The methods employed include participatory approaches, educational outreach, technical demonstrations, and direct community mentoring. The results of the program indicate an improvement in residents' understanding and skills in transforming organic waste into useful products such as organic fertilizers for household farming. This initiative is expected to foster environmental awareness and encourage community self-reliance in sustainable waste management.
Keywords: *Organic Waste, Liquid Fertilizer, Solid Fertilizer, Simple Composter, Environmental Management*

Introduction

Waste refers to materials that are no longer used, unwanted, or must be discarded. It is generally produced from human activities (Utiningtyas et al., 2023). Waste has become one of the most urgent environmental issues that requires serious attention in

Indonesia. As a country with a large population, the high level of consumption generates a significant volume of waste every day. Ineffective waste management in many areas, coupled with low public awareness, has made waste accumulation increasingly difficult to control. The waste problem is not limited to urban areas but also extends to rural regions, making Indonesia one of the largest waste-producing countries in the world (Liputan6.com).

The issue of waste management, particularly organic waste, remains a crucial concern in various regions, including the Sarongge neighborhood, Kemanisan Village, Curug District. In this area, several waste accumulation points can still be found, increasing daily due to household, plastic, and other types of waste. Observations indicate that as the population grows, the volume of waste also increases. The absence of a structured waste management system in the village has led residents to dispose of their waste in temporary dumping sites that are no longer sufficient. As a result, people tend to burn their waste to reduce its volume, with no effort to recycle either organic or non-organic materials.

Although some residents have begun separating waste based on type, the lack of knowledge about organic waste management makes the process ineffective (Wahyuningsih et al., 2023). Most household waste consists of organic materials that actually have the potential for reuse. However, low environmental literacy and limited access to simple waste management technologies have caused such waste to end up in landfills without any recycling process (Sinaga et al., 2023).

Processing organic waste into liquid and solid fertilizer is one of the practical efforts that can be implemented at the household level (Amalia Maghfiroh et al., 2023). Approximately 70% of household waste consists of organic materials, which can be converted into compost using a simple device known as a composter or compost reactor (Rini et al., 2021). The use of simple composters serves as an appropriate technology alternative that transforms organic waste into valuable products for agriculture and greening (Purimahua et al., 2023). The fundamental step is to understand composters and organic materials that can “magically” transform waste into solid compost and liquid organic fertilizer (Sinaga et al., 2023). Simple composters are easy-to-make, low-cost tools capable of converting organic waste into nutrient-rich compost.

The use of compost in plant cultivation not only helps reduce waste volume but also produces organic fertilizer that enhances soil fertility and agricultural productivity. Compost-based fertilizers contain essential nutrients that can reduce the dependency on chemical fertilizers, making them more environmentally friendly and economically feasible (Riza Syofiani et al., 2025).

This Community Service Program (PKM) aims to enhance knowledge and educate the residents of Sarongge, Kemanisan Village, on how to create and utilize simple composters. Through a participatory approach, the community is guided to understand the composting process—from waste collection and processing to the utilization of compost as organic fertilizer in agriculture. This program is expected to encourage community independence in managing organic waste and promote an agricultural system that is efficient, environmentally friendly, and sustainable. The initiative not only focuses on waste reduction but also seeks to improve farmers’ welfare by reducing production costs and increasing crop yields (Naufa et al., 2023).

The Community Service Team (KKM Group 11) from Universitas Bina Bangsa coordinated with local authorities, including the Head of Kemanisan Village and the Head of Neighborhood Unit (RT 02), to organize the **“**Organic Waste Management Program: Socialization of Making Liquid and Solid Fertilizers Using Simple

Composters in the Sarongge Neighborhood". The program involved socialization and practical activities on how to process household organic waste into compost using simple composting methods. Utilizing organic waste as compost can reduce environmental pollution, generate economic value, and provide nutrients for plants.

The purpose of this program is to empower the community and enhance their technological knowledge regarding household organic waste management through simple composting techniques. The activity aims to increase public understanding of:

1. The impact of waste accumulation in the Sarongge community, Kemanisan Village, Curug District.
2. The benefits of using compost derived from household organic waste to reduce pollution-causing waste.
3. The utilization of organic fertilizers through independent household composting practices.

Implementation Method

This community empowerment and development program, focusing on the creation of simple compost bins, was carried out on Friday, August 5, 2025**,** from 4:00 PM to 5:30 PM**.** The activity took place in Sarongge neighborhood, Kemanisan Subdistrict, Curug District, Serang Regency, Banten Province**.** The method used was socialization, introducing household organic waste management through composting using a composter to produce both solid and liquid fertilizers**.**

A. Implementation Method

In a warm and interactive atmosphere, the series of activities were designed to provide participants with both a deep understanding and practical experience, ensuring that the materials delivered could be immediately applied in daily life. The activity series included the following stages:

1. Explanation of Organic and Non-Organic Waste
2. Presentation on How to Make a Composter
3. Demonstration of the Composter Prototype
4. Explanation of Solid and Liquid Fertilizers
5. Discussion on the Functions of Solid and Liquid Fertilizers
6. Practice Session on Using Liquid Fertilizer (Leachate)
7. Question and Answer Session with residents regarding the composter presentation
8. Handover of Composters and Group Photo Session

Participants were given the opportunity to engage in interactive discussions to better understand how to use the composter — from the decomposition of organic waste to the production of ready-to-use compost. This activity not only enriched residents' knowledge but also helped them learn practical techniques that can be independently implemented at home.

B. Composting Method

A composter is a tool used to process household organic waste into compost by utilizing used buckets or containers. Its system works by processing kitchen waste (approximately 45%–53%) of total household waste, which then undergoes a decomposition process assisted by microorganisms found in the waste and used soil.

1. Types of Waste Processed

Several types of organic waste that can be converted into compost include:

- Food scraps such as vegetables, fruits, and spoiled meat
- Dried leaves and grass
- Small wood pieces
- Expired kitchen spices, and other similar materials

Figure 1. organic waste that is only 4 days old

2.a. Procedure for Making a Composter

Before the composting process begins, a composter—a container used to separate liquid and solid fertilizer—is first prepared. The use of a composter helps accelerate the decomposition process, allowing organic materials to break down more efficiently. This step is essential because decomposition must keep pace with the continuously increasing volume of waste. Organic waste management can be carried out using composting methods under aerobic or anaerobic conditions as an alternative waste management approach (Lukhi Mulia Shitophyta & Jamilatun, 2021).

A composter is a tool or container used to process organic waste, such as food scraps, dry leaves, and other kitchen waste, into compost (Ningsih & Siswati, 2021). Compost is a natural fertilizer formed through the decomposition of organic materials by microorganisms. The main products of the composter are solid compost (organic fertilizer rich in plant nutrients) and, if using a liquid aerobic method, leachate or liquid compost, which can be utilized as liquid organic fertilizer for watering plants.

Composter Working System

1. Biodegradation by microorganisms (bacteria, fungi, and other microbes) that break down organic materials into simpler compounds.
2. The process can occur aerobically (with oxygen) or anaerobically (without oxygen), depending on the type of composter used.

Steps for Making a Composter

1. Prepare one drum as the main container.
2. Create ventilation holes on the drum lid and upper sides.
3. Make a waste input hole**,** and install an air pipe in the center of the drum.
4. Cut an iron rod according to the drum's diameter to serve as a support frame inside the drum.
5. Create an access door for removing solid compost.
6. Drill a small hole the size of a faucet for draining liquid

fertilizer**.** How the Composter Works

1. Collect organic materials such as dry leaves, food scraps, and fruit peels.
2. Cut or shred the materials into smaller pieces to accelerate decomposition.
3. Mix them with supporting materials such as soil, sawdust, or EM4 (bio-activator).
4. Decomposition process: Let the mixture sit in the composter and stir

occasionally to maintain air circulation.

5. After 2–8 weeks (depending on the method used), the compost is ready for use.

Figure 2: Compost Bin Construction

2.b. Compost-Making Procedure

The procedure for making compost begins by cutting organic waste—such as food scraps (vegetables, fruits, and spoiled meat), leaves, wood pieces, and expired kitchen spices—into small parts. Next, a liquid decomposer solution (EM4) is prepared by mixing molasses (brown sugar) and water in a ratio of 1:1:50. The mixture is then sprayed onto the chopped organic waste placed in a basin.

A bucket (used as a composter) with holes drilled at the bottom is prepared, along with another basin positioned underneath to collect the leachate, which forms as a by-product during the fermentation process and serves as liquid fertilizer.

The next step involves adding used soil to the bottom of the bucket, followed by a layer of household organic waste. Then, another layer of used soil is added on top, alternating with more organic waste, repeating this process until all materials are used up. Afterward, the composter is closed with a lid and left to ferment for approximately one month. Once the fermentation process is complete, the compost is ready to use.

Compost made from organic waste materials can be used to provide nutrients to plants in organic farming systems. The composting process enriches the soil by increasing its nutrient content (Naufa et al., 2023). According to Anggraeni et al. (2024), composting is one of the key processes for converting organic waste into new material, similar to humus. Furthermore, Jamaluddin et al. (2021) emphasize that the selection of mixing materials in composting must be carefully considered, as it greatly determines the nutrient composition of the final product.

Figures 3 & 4. Solid fertilizer (compost) and Liquid fertilizer (leachate)

3. Evaluation of Program Implementation and Program Sustainability after the Community Empowerment and Development Activity

The evaluation of the program's implementation and sustainability after the completion of the community empowerment and development activities was carried out through several follow-up actions. Every three days, the implementation team conducted on-site visits to the locations where the composters were being used to monitor progress and gather feedback from the participants.

The evaluation process also included interviews with residents to assess the development and practical application of the program. In addition, discussions were held with local administrative representatives, including the village officials and neighborhood heads (RT), to identify the benefits of the activities conducted and to evaluate the impact of waste reduction should the program continue in the long term.

Result and Discussion

The community service activity held on Friday, August 5, 2025, in Sarongge Neighborhood was successfully conducted and received positive responses from the residents. Several community members attended and actively participated in the entire program, which included educational sessions and hands-on practice in making and using composters.At the beginning of the activity, participants received explanations regarding the differences between organic and non-organic waste, along with the negative impacts of improperly managed organic waste. This session emphasized the importance of managing organic waste through composting as an environmentally friendly solution to reduce waste accumulation and optimize the use of household waste. Following this, the facilitator explained how to make a simple home-based composter**,** as well as the functions of solid and liquid fertilizers produced from composting and how to apply them effectively to enrich plant growth. Through this knowledge, residents are expected to independently and sustainably practice organic waste management within their respective communities.

During the session, participants gained both theoretical and practical knowledge on producing and utilizing solid and liquid compost (leachate), guided by Group 11 students from Universitas Bina Bangsa. The residents showed high enthusiasm, particularly during the question-and-answer and discussion sessions**,** where they asked various questions related to waste management into fertilizer**,** how composters work**,** the benefits of solid and liquid fertilizers for plants, and practical tips for managing household organic waste. This active interaction reflected a growing environmental awareness among the residents and marked an important step toward utilizing local resources to support eco-friendly household agriculture.

Through the composter, two types of fertilizer are produced — solid compost and liquid fertilizer. The steps for producing both types are as follows:

1) Composter Preparation
   a) Prepare two used buckets. The bottom bucket should be fitted with a tap to collect the leachate (liquid fertilizer), while the top bucket should be perforated to allow liquid drainage.
   b) Stack the buckets so that the perforated bucket is on top of the one with the tap.
2) Preparation of Waste and Activator
   a) Cut the waste**:** Chop organic waste (vegetable scraps, fruit peels, eggshells, dry leaves) into smaller pieces to speed up the decomposition process.
   b) Prepare the activator**:** Mix well water (not tap water) with EM4 (Effective Microorganisms 4) and molasses or brown sugar. The commonly used ratio is

1:50 (EM4:Water), or alternatively, use fermented rice-washing water mixed with molasses.

3) Composting Process
   a) Base layer: Place approximately 5 cm of soil at the bottom of the upper bucket.
   b) Add waste**:** Place the chopped organic waste evenly on top.
   c) Activator layer: Spray the waste with the EM4–molasses solution prepared earlier.
   d) Cover layer: Add another layer of soil to help reduce odor and accelerate decomposition**.**
   e) Seal tightly**:** Close the composter firmly and store it in a shaded area.
4) Composter Maintenance
   a) Routine check: Stir the compost mixture once a week to ensure even decomposition.
   b) Harvesting leachate (liquid fertilizer): After two weeks or more, collect the leachate from the tap of the bottom bucket. This liquid serves as organic liquid fertilizer.
5) Harvesting Solid Compost
   a) Solid compost can be harvested after the decomposition process is complete, typically after about one month**.**
   b) The compost is ready for use when it becomes dark brown, has an earthy smell**,** and shows no remaining undecomposed waste.

How to Use the Fertilizer

a) Solid Fertilizer : Mix the solid compost with soil (e.g., 1 sack of compost to 1 sack of soil) before applying it to plants.

b) Liquid Fertilizer : Dilute the collected leachate with water at a ratio of 1:10 before watering the plants.

Leachate aged about three weeks typically appears dark brown to black, has a strong odor, and a thicker texture with slight sediment. This condition indicates that the organic waste has undergone maximum decomposition, resulting in a high content of essential nutrients such as nitrogen (N), phosphorus (P), and potassium (K). However, it still needs to be diluted before use.Leachate, a byproduct of the composting or decomposition process of organic waste, is utilized as an organic liquid fertilizer to promote healthy plant growth.

Figure 5. Application of liquid fertilizer (leachate) on plants

The results of the series of discussions indicated an increase in public awareness, particularly among youth, regarding the importance of independent organic waste management. This understanding encompasses the awareness that

managing organic waste not only contributes to environmental sustainability, but also represents a form of social responsibility for every individual in maintaining cleanliness and environmental health in their surroundings.

Moreover, the use of composters provides dual benefits—it helps reduce both waste management costs and the volume of waste sent to Final Disposal Sites (TPA), while simultaneously producing natural fertilizer that enriches soil fertility. This creates a sustainable cycle of organic waste utilization within the community (Riza Syofiani et al., 2025).


Figures 6 & 7. Post-Practice Session and Composter Handover

The activity concluded with the handover of composters to local residents as a form of support and commitment toward promoting independent waste management practices in the Sarongge neighborhood, with the expectation that the program would continue sustainably. Through this initiative, residents are encouraged to apply the knowledge gained during the activity and implement it effectively in their daily lives.

Consistent use of composters will help create a cleaner and healthier environment, while also increasing productivity through the use of the organic fertilizer produced (Utiningtyas et al., 2023).

Conclusion

The community service activity, which involved socialization and training on producing liquid and solid fertilizer using simple composters, has had a positive impact on the knowledge, skills, and awareness of residents in managing organic waste. Through this program, the community gained new insights into the importance of transforming organic waste into valuable products, thereby changing the perception of waste from being merely discarded material to a valuable resource.

The series of activities—including education, hands-on practice, and interactive discussions—enabled participants to fully understand how composters work, the benefits of compost for plant growth, and the urgency of reducing the volume of waste sent to Final Disposal Sites.Armed with this knowledge, residents are expected to consistently apply organic waste processing techniques at home, thereby contributing to the creation of a cleaner, healthier, and more sustainable environment. The active participation of residents throughout the program reflected their strong enthusiasm for practicing independent organic waste management.

This was evident in their involvement throughout the entire activity—from the educational sessions and practical fertilizer-making demonstrations to the lively interactive discussions. The residents were not merely passive listeners but were

actively engaged in asking questions and sharing experiences, creating a collaborative and participatory learning atmosphere As awareness continues to grow, residents are beginning to realize that organic waste—once considered useless—can actually be transformed into beneficial products, such as natural fertilizers for home-based agriculture.

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