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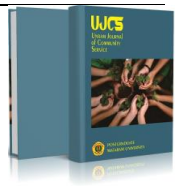

Empowerment of the Environment Through the Utilization of Organic Waste as Raw Material for Organic Fertilizer Production in Pandan Wangi Village

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Abstract: The use of fertilizers plays an important role in increasing agricultural productivity. However, long-term dependence on chemical fertilizers poses a risk of reducing soil fertility, causing nutrient imbalances, and leading to the accumulation of chemical residues that negatively impact the soil ecosystem. Pandan Wangi Village, which develops the agricultural and livestock sectors side by side, still faces challenges in managing organic waste. This condition leads to environmental pollution and a high dependence on chemical inputs in agriculture. This program aims to reduce the use of chemical fertilizers by utilizing livestock waste as a raw material for organic fertilizers, which can enhance soil fertility and reduce environmental impacts. This activity involves socialization and training to improve the knowledge and skills of the community in independently producing organic fertilizers. This program is expected to provide long-term benefits for agricultural productivity and empower communities towards a more sustainable and environmentally friendly agricultural system.

Keywords: Organic Fertilizer, Animal Manure, Community Empowerment.

Introduction

The use of fertilizers is one of the main factors in supporting agricultural productivity (Worotitjan et al., 2023). However, farmers' dependence on chemical fertilizers in the long term can lead to various problems, such as soil fertility decline, nutrient imbalance, and the accumulation of chemical residues that can disrupt the balance of the soil ecosystem (Maryam & David, 2018).

On the other hand, the utilization of organic fertilizers from plants or animal manure is still not optimal, even though these waste products have great potential to be processed into compost. Compost is an organic fertilizer that comes from plant residues or animal manure that has undergone the processes of decay or decomposition (Ratriyanto et al., 2019). The composting process is carried out by utilizing microorganisms as decomposers. Through this stage,

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organic materials are transformed into fertilizers with a high nutrient content and produce beneficial microorganisms for the soil and plant growth (Bachtiar & Ahmad, 2019; Utomo & Nurdiana, 2018). The composting process can be done using aerobic or anaerobic methods, each of which has its own advantages in producing nutrient-rich and environmentally friendly fertilizers (Mangalisu et al., 2022).

Pandan Wangi village is one of the villages located in the Jerowaru district, East Lombok regency. Besides farming, the majority of the villagers have side businesses in the field of livestock. Animal waste generated from livestock farming is still not being managed properly by the community. In fact, livestock waste that is left to accumulate can cause pollution of the air, water, and soil, as well as increase the risk of disease spread. Furthermore, the low utilization of organic fertilizers makes farmers still very dependent on chemical fertilizers to improve their crop yields.

As a solution to this problem, the processing of livestock manure into organic fertilizer can be an effective step in supporting a more sustainable agricultural system. The use of organic fertilizer from livestock manure not only increases soil fertility and agricultural productivity but also helps reduce environmental pollution. In addition, utilizing livestock manure as organic fertilizer can be a more economical and environmentally friendly alternative compared to chemical fertilizers.

Therefore, this program aims to reduce the dependence of the community of Pandan Wangi Village on chemical fertilizers by processing livestock waste into organic fertilizer. This activity will be carried out through socialization and training to enhance the knowledge and skills of the community in independently producing organic fertilizer. Thus, it is hoped that this program can provide long-term benefits in improving agricultural yields while also serving as an empowerment effort to support more environmentally friendly farming.

Method

The implementation of activities is carried out through 4 stages. The stages of the activities include:

1. **Identification Stage.** This stage aims to identify the needs and problems in the community. Activities conducted include interviews and surveys with farmers, community leaders, and related parties to understand the challenges faced. Additionally, in this stage, the mechanisms for implementing activities and the locations to be used for the production and processing of organic fertilizers are also determined.
2. **Socialization and Training Stage.** This activity was held on Sunday, January 19, 2025, at the Pandan Wangi Village Office. The event began with remarks from the KKN Chair and the Head of Pandan Wangi Village, followed by a presentation on organic fertilizers and their production process. The activity was conducted practically, where participants were shown and directly involved in the making of organic fertilizers with direct guidance from the presenter.
3. **Production, Fermentation, and Packaging Stage.** In this stage, the organic fertilizer that has been mixed with additives is fermented for 3-4 weeks before it can be used. After the fermentation process is complete, the fertilizer is packaged in labeled containers to facilitate distribution and use.
4. **Creation of Organic Fertilizer Leaflet.** The creation of the leaflet aims to provide information about organic fertilizers to the public.

Result and Discussion

1. **Identification Stage**

Based on the results of identification through direct interviews, it is known that the majority of the people in Pandan Wangi Village, most of whom are farmers, are still unaware of how to make organic fertilizer from livestock manure, one of which is goat manure. Until now, the community has not been able to optimally utilize livestock manure and is still heavily dependent on the use of chemical fertilizers. This dependency not only results in higher costs but also poses ongoing risks to the environment.

2. **Socialization and Training Stage**

The socialization activities that have been carried out for the community aim to enhance their awareness and knowledge regarding the potential utilization of livestock waste. During the socialization process, the community showed enthusiasm for the material presented and actively asked questions to the speakers (Figure 1).

Figure 1. Presentation of material on organic fertilizers

3. **Production, Fermentation, and Packaging Stage**

The process of making organic fertilizer from animal waste begins with preparing tools such as a hoe, sacks, buckets, and tarpaulin. Next, materials are

prepared such as EM4, sugarcane molasses, agricultural lime (dolomite), rice husk, dry leaves, and animal manure. The arrangement of materials for composting is done by mixing animal manure with rice husk, straw, and dry leaves. Then, dissolve molasses in water at a ratio of 1:100 (solution 1) and EM4 in water at the same ratio (solution 2). Combine solution 1 and solution 2, then stir until well mixed. Water the mixture of livestock manure, rice husk, straw, and dry leaves with this solution, mix thoroughly, and cover tightly to create an ideal anaerobic environment for fermentation. Ferment for 3-4 weeks. This will turn the materials into nutrient-rich fertilizer that is ready to use.

During fermentation, microorganisms produce enzymes that catalyze the decomposition of organic material, converting it into simpler and more bioavailable compounds such as nitrates, phosphates, and essential micronutrients (Kurniawan et al., 2023). The addition of EM4 serves to enhance the decomposition of organic materials, making the fertilizer production process more efficient and effective (Bachtiar & Ahmad, 2019).

Figure 2. Demonstration of organic fertilizer production

The pile of fertilizer that has been assembled needs to be monitored during the fermentation process (Figure 3). This is aimed at maintaining a stable fermentation environment. The fertilizer that is ready is then packaged in containers to facilitate the distribution process (Figure 4).

Figure 3. Monitoring organic fertilizer that is being fermented

Figure 4. Packaging of organic fertilizer

4. The Creation of Organic Fertilizer Leaflet

The production of leaflets is intended to provide information about organic fertilizers so that the production of this organic fertilizer can continue in the community. The information included in the leaflet covers the definition of organic fertilizer, the benefits of organic fertilizer, how to make it, and how to use organic fertilizer.

Figure 5. Organic Fertilizer Leaflet

Optimal management of livestock waste can provide significant benefits to the community, especially in reducing dependence on chemical fertilizers. One of the efforts that have been made is

the socialization and training in the production of organic fertilizers. This activity aims to educate the community about how to process livestock waste into valuable fertilizer and to raise awareness of the importance of utilizing waste.

In addition to providing new insights, this training also equips the community with practical skills in producing organic fertilizer. With a simple yet effective method, they can produce quality fertilizer that is environmentally friendly and more economical compared to chemical fertilizers. The impact not only enhances soil fertility and agricultural yields but also opens up opportunities for sustainable agriculture-based businesses. More than just waste management, this activity also promotes the economic independence of the community. By utilizing simple technology, the people of Pandan Wangi Village can develop an organic fertilizer business that has the potential to improve their welfare.

Conclusion

The processing of livestock waste into organic fertilizer in Pandan Wangi Village is an effective step to reduce farmers' dependence on chemical fertilizers. The socialization and training activities carried out not only increase the community's knowledge about how to produce organic fertilizers but also provide sustainable and environmentally friendly skills. It is hoped that this will improve soil fertility, agricultural productivity, and encourage economic independence among the residents, thus providing long-term benefits for the community.

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