

## IMPLEMENTATION AN EVALUATION OF A COMPOSTING PROGRAM FROM HOUSE HOLD ORGANIC WASTE IN PETUNG VILLAGE

Lamiasih<sup>1</sup>, Muhammad Najib Izzulhaq<sup>2</sup>, Syifa Sabrina<sup>3</sup>, Nawang Kurniawati<sup>4</sup>,  
Anisa Widiastuti<sup>5</sup>

<sup>1 2 3 4 5</sup> Sunan Kalijaga State Islamic University, Yogyakarta  
[lamiasih17@gmail.com](mailto:lamiasih17@gmail.com)

**Abstract** - Composting is one of the many methods of processing organic waste that aims to reduce and change the composition of waste into more useful fertilizer. This article attempts to provide an overview and explanation of the work program for making compost fertilizer, including the process, stages, results and benefits. This article was written using a qualitative approach with a descriptive-explanatory model. As a result, the community gained new understanding and insights about the use of household organic waste. In addition, people can reduce the use of chemical fertilizers and factory-made fertilizers, which are generally used by village communities, thereby reducing expenses in the agricultural process. This article is limited to the implementation of regular KKN 114 at UIN Sunan Kalijaga Yogyakarta 2024. This article also contributes to the implementation strategy of the SDGs points.

**Keywords:** Waste, Compost.

## **1. INTRODUCTION**

The increase in population is directly proportional to the development of time. This leads to various problems in the fields of education, politics, economy and even the environment. The increase in population leads to an increase in consumption power, which causes an increase in the amount of household waste produced, both organic and inorganic. Various efforts have often been made to overcome this waste problem, one of which is the production of compost from household waste. (Aristoteles, et al., 2021).

Composting is one of many organic waste processing methods that aim to reduce and change the composition of waste into useful products. According to Suwatanti (2017), composting is a process of processing organic waste into new products in the form of humus, and generally compost made from organic waste derived from plant and animal waste, which is intentionally added so that there is a balance of nitrogen and carbon elements, thereby speeding up the decomposition process and creating an ideal N/C ratio. In this way, it started from the problems encountered in the community where the organic waste in Petung village was left alone without any processing. If there is proper waste processing, the organic waste can be useful and have added value if the amount is increased or produced manually.

The types of household waste used in the composting process include fruit peels, vegetable waste and leaf waste as a source of nitrogen. Dry waste in the form of cardboard, paper and tissue is also used as a carbon source. The nitrogen and carbon sources are then broken down by the digester into compost. Meanwhile, the time required for this process from preparation to compost ready for use is estimated at 4 weeks depending on the capacity of the fertilizer to be made.

This activity aims to reduce the amount of household waste in the village environment and, if produced in large quantities, will have added value. It is hoped that compost fertilizer can be an alternative source for village communities to reduce the use of chemical fertilizers and factory-made fertilizers, which are often used by village communities. Moreover, compost fertilizer is better known in rural areas. It is hoped that with the presence of compost, the community can store organic waste to be used as more useful material.

## **2. METHOD**

The method used in writing this article uses a qualitative approach with a descriptive-explanatory model, which aims to provide detailed illustrations regarding the work program for making compost during the Real Work Lecture, as well as explaining the steps starting from before making, the process, to the output and outcome of the program that work. The data used in writing this article are primary data obtained from the experience and direct observation of the group members, as well as secondary data obtained by reviewing a number of literature and previous research related to the production of compost fertilizer. The following are the tools and materials used in making compost:

## **Tools and materials**

Tools and materials used :

- 1) container/bucket and the cover
- 2) rice washing water
- 3) Activator EM4
- 4) Organic waste
- 5) Knife
- 6) Stirring

### **A. Work procedures**

The production of compost fertilizer in this work program has several stages as follows:

1. Household organic waste that has been collected is then chopped into small pieces. The smaller the particle size of the waste, the faster the composting process.
2. Then, finished compost/soil/manure/rice washing water is added as an inoculant.
3. These ingredients are then mixed evenly with the EM4 Activator solution until it reaches a consistency that is not too dry.
4. Once the ingredients have been thoroughly mixed, they are stored in a tightly closed container for 4 weeks.
5. The ingredients must be stirred every 4 days to maintain proper aeration (air flow) in the container.
6. During the composting process, the temperature in the container will rise. This indicates that the microorganisms are working.
7. After 4 weeks, the composting process is complete and the compost is ready for use.

### **3. RESULTS AND DISCUSSION**

The socialization work program for the production of compost from household organic waste lasts 1 day. This program is carried out in 1 activity, which consists of presentation of materials and manufacturing practice by KKN students. On Sunday, August 4, 2024, this program was implemented by collecting some kitchen waste and equipment used for composting. Next, representatives of KKN members explained the material to a number of residents who participated in the socialization activity. Then it continued with the practice of making compost fertilizer by representatives of KKN members accompanied by other KKN members. In order to find out to what extent the implemented work program is running well and can provide benefits to the village communities, it can be seen from the final evaluation. Meanwhile, to determine the smoothness of this work program, it can be illustrated as the activities take place.

The implementation of the work program for the production of compost fertilizer begins with the presentation of material on organic waste and its processing by showing a PowerPoint presentation explaining organic household waste. This lesson includes the potential and benefits as well as the steps to make compost from household organic waste. This was followed by a presentation of material on how to process household waste into usable compost. KKN members practiced making compost under the watchful eyes of a number of people who attended the socialization, and it was hoped that people would gain knowledge about making compost and be able to make it independently at home.



**Picture 1.** KKN members demonstrating the compost fertilizer production process

Based on our monitoring and observations during the course of this work program, it can be concluded that the interest and attention of the people of Petung Village, Kasihan District, Bantul Regency to the extension materials presented is quite high. This can be seen from the many questions asked by the people who participated in the extension activities. The questions are not only about how to make compost, but also about the difference between using compost and chemical fertilizers. People also ask how to use compost fertilizer in the local environment. An example of a question asked by a member of the public is: are there other methods to make compost, then another question is: is it permissible to use household waste directly without first making compost. The atmosphere of the consultation becomes more lively and less monotonous because of the enthusiasm of the community, who always pay attention to the explanations and ask questions when they don't understand.

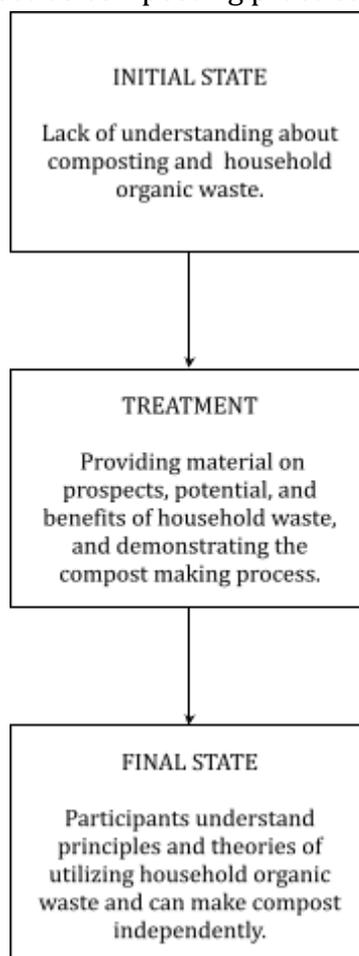
Previously, the community had never been given an understanding and practical examples of how to utilize household organic waste, namely how to make compost fertilizer in Petung Village. It is hoped that this guidance and practical examples can provide new knowledge to the community and utilize household organic waste, one of which is making compost, which is certainly very useful for village communities. Making compost can reduce farmers' expenses in the agricultural process. For more details on the initial and final conditions expected from the behavior of the extension participants in Petung Village, see Table 1.

**Table 1.** Initial state and final state expected from counseling participants

No	Initial State	Treatment	Final State
1	The community, especially those who take part in counseling, do not understand and know about making compost fertilizer from the use of household waste.	providing material regarding the prospects, potential and benefits of household waste.	Extension participants can know, understand and also master the principles and theories of utilizing household organic waste.
2	People who take part in outreach activities have not yet mastered the practice of making compost from household organic waste.	providing an example of the practice of making compost from household organic waste.	Extension participants are able to make household compost independently.

Based on the table displayed, it can be seen that insight regarding the use of household organic waste is still low, the use and utilization of household organic waste should be able to be done as a substitute for chemical fertilizers. This can reduce the use of factory-made fertilizers and reduce the amount of expenditure.

To illustrate the expected process of change and improvement, the following schematic provides a visual representation of the steps involved in transitioning from low understanding to effective composting practices.



**Picture 2.** schematic showing the process before and after participating in composting education

The schematic below visually represents this progression, showing the transition from a lack of understanding to the successful application of composting techniques.

Compost is organic materials (organic waste) that have undergone a weathering process because there is interaction between microorganisms (bacteria that cause rot) working in it (Mubandono, 2007). Compost fertilizer is very good to use for various reasons, for example it doesn't damage the environment, it's easy to find, it's cheap, the manufacturing process is also easy to do. Organic material (compost) is one of the elements that forms soil fertility, and to produce fertile soil it is necessary to add organic material. Pereira, et al., (2014), that organic material is a buffer that functions to improve the chemical, physical and biological properties of soil. Composting is the process of decomposing organic materials by various microbes that utilize organic materials as an energy source (Dewi and Trisnowati, 2012). Compost making is carried out by arranging and controlling a balanced mixture of organic materials, providing sufficient water, regulating aeration, and providing inoculant/composting activator (Manuputty, et al, 2012). Composting is an effort that has been used for a long time to reduce organic waste (Caceres et al., 2015). The addition of compost to the soil can improve the physical properties of the soil such as the formation of soil aggregates or granulations and increase the permeability and porosity of the soil.

The availability of organic waste raw materials around us supports processing waste into products that have added value. One step is to process organic waste into compost. Effective Microorganisms (EM4) is a mixed culture of microorganisms beneficial and beneficial containing fermentation and synthetic microorganisms consisting of Acid bacteria Lactate (*Lactobacillus Sp*), Photosynthetic Bacteria (*Rhodospseudomonas Sp*), Actinomycetes *Sp*, *Streptomyces SP* and Yeast (yeast) and cellulose decomposing fungi. This ingredient helps ferment soil organic matter into organic compounds that are easily absorbed by plant roots. The purpose of adding EM4 is to breaks down the long chains that make up organic waste into simpler molecules.

Based on the activities carried out in the composting work program for the residents of Petung Village, the following results were obtained:

1. Residents of Petung Village can find out the meaning of waste and organic waste through the outreach provided.
2. Residents of Petung Village can find out the benefits of organic waste which can be processed into compost. Apart from that, we also know that organic waste can improve water quality if it is processed into eco enzymes.
3. Compost is an example of organic fertilizer. The result of the process of making compost is soft organic fertilizer which can be waited up to 4 weeks until it can finally be used as plant fertilizer.

By utilizing waste at home, such as fruit leftovers, vegetable waste, leftover harvests that are rich in nutrients, and other similar things, village communities can make something useful such as compost. The purpose of fertilizer added to the soil is to enrich soil fertility. People cannot directly add compost to the soil because they have to wait for the process of decomposing organic materials with the help of microorganisms. The success rate for the practice of making compost is 70%. This is because the compost made by KKN members does not reach the 4 week composting period (only the practice of making it without any review).

The composting process results in a reduction in the weight of the compost raw material. Compost will decompose properly naturally, usually taking 3-4 weeks. Stirring and checking must be done so that air circulation can run well and remove gas excreted from microorganisms. Providing practical examples of making compost from household organic waste can encourage people to make it themselves at home using simple tools and materials.

If people can get used to using organic fertilizer, they can reduce dependence on factory-made chemical fertilizers. Subsidized chemical fertilizers are often difficult to find in some areas, so people have to think about finding new ways to provide nutrition to their plants. The nutrient content in chemical fertilizers can be absorbed quickly by plants so that it can speed up the planting period. However, there are drawbacks to using chemical fertilizers in the long term, namely land productivity decreases so that the land becomes critical and no longer productive in producing agricultural crops. Residues and chemical substances produced from chemical fertilizers can cause damage to land (Abdurachman, et al., 2008).

Offering a solution in the form of using organic fertilizer from household waste can slowly be implemented. The use of compost can help to improve critical land. According to Larasati and Puspikawati, 2019, organic matter can determine soil quality for sustainable agricultural production through its influence on the physical, chemical and biological properties of the soil. Even though organic fertilizer has many benefits and advantages for improving soil and plant fertility, many people still don't know about this. Therefore, with the socialization work program for making compost fertilizer from household organic waste, it is hoped that the people of Petung Village can slowly switch to using compost fertilizer as plant nutrition.

Supporting factors and Inhibiting factors

1. Supporting factors

The following are factors that support the smooth and successful work program:

- a. There is good cooperation between fellow communities and KKN members, from planning to implementing work programs.
- b. There are adequate facilities and infrastructure in the form of tools and materials, such as laptops, LCDs and household waste that have been prepared.

## 2. Inhibiting factors

The inhibiting factor for this work program is that not all people can take part in socialization activities due to various busy schedules.

## 4. CONCLUSION

Based on the results and discussion of the socialization of making compost fertilizer from household organic waste, the following conclusions can be drawn :

1. The Petung Village community's attention to the counseling material delivered by the KKN team is quite high. This can be seen from the number of people who attended the socialization activities, actively asking questions during the question and answer session, and also the enthusiasm of the people when the KKN team demonstrated how to make compost fertilizer.
2. The public can follow well and pay attention to the practice of making compost fertilizer, the public's curiosity is quite high. Through this activity, it is hoped that people can switch their use of factory-made chemical fertilizers to compost from household waste. The success rate of fertilizer making practice is 70% because there is no review for 4 weeks (only the practice of making fertilizer and not completion). This is because the socialization on making compost fertilizer was carried out towards the end of the KKN period. However, it is hoped that people can understand the material and know how to make fertilizer and can make it independently at home.
3. By implementing sustainable organic farming, even if only for plants at home, people can minimize the use of factory-made chemical fertilizers. Continuous use of chemical fertilizers over a long period of time can have negative impacts on soil and plants. This has an impact on crop production. It is hoped that using organic fertilizer from household waste can help reduce people's spending on buying fertilizer.

Based on these conclusions, it is recommended that a team be deployed to observe the community's farming conditions and provide education about fertilizers. Additionally, efforts should be made by the education department to offer both educational and practical training on composting from household waste, particularly for the general public.

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