

MANAGEMENT OF LIVESTOCK AND AGRICULTURAL WASTE INTO COMPOST FERTILIZER AS EMPOWERMENT AND AGRICULTURAL SUPPORT IN KALILOKA VILLAGE

Gilang Surya Pambudi^{1*}, Hanif Muhammad Al Faqih², Lutfiya A'malina³, Erna Nur Khasanah⁴, Siska Istifariza⁵, Nur Maria Ulfa⁶, Farah Arifatul Hasna⁷, Kusuma Dani⁸, Atikah Khairunnisa⁹, ArdhiaPramesthi Regita Cahyani¹⁰, Haidar Nushir Bi'aunillah¹¹, Atipa Muji¹².

¹⁻⁸ UIN Prof. K.H. Saifuddin Zuhri Purwokerto

⁹ UIN Sunan Gunung Djati Bandung

^{10,11} UIN Sunan Kalijaga Yogyakarta

gilangsurya617@gmail.com¹, hanifm.alfaqih2003@gmail.com²,

lutfiyaamalina123@gmail.com³, ernanurkhasanah16@gmail.com⁴,

siskaistifariza@gmail.com⁵, nurmariaulfaa@gmail.com⁶, farahhasna85@gmail.com⁷,

dkusuma180@gmail.com⁸, atikahkhairunnisa0@gmail.com⁹, ardhiapramesthiregita@gmail.com¹⁰,

haidarnushirbiaunillah@gmail.com¹¹, atipa@uinsaizu.ac.id¹²

Abstract *If livestock and agricultural waste are not properly processed, then both elements can cause diseases and discomfort, in addition to having a negative impact on the ecosystem through the pollution of soil, water, and air. To meet nutritional needs and enable healthy growth and development of plants, fertilizers are one or more nutrients required by plants and applied to the growing medium. Maximizing the use of organic fertilizers is one way to reduce the long-term impact of chemical or inorganic fertilizers. To convert fermented agricultural waste into compost, decomposing microorganisms must be used to gather livestock manure and other waste materials. The production of compost is carried out by providing counseling on compost fertilizer and then holding a practical workshop where residents learn how to make compost. The final product is compost, which can be used by the community as a substitute for chemical fertilizers in agricultural practices. The purpose of creating this compost fertilizer is to transform agricultural and livestock waste into empowerment agricultural and support compost,*

which reduces the need for chemical fertilizers and minimizes the pollution caused by agricultural and livestock waste on the environment. This is another benefit of this community service program

Keywords: *Livestock Waste, Agricultural Waste, Compost*

1. INTRODUCTION

Kaliloka Village is part of Sirampog Subdistrict, Brebes Regency. Based on the terminology in Kaliloka Village, Sirampog Subdistrict, Brebes Regency, there are many people who depend on their economy as goat breeders, farmers and plantations. The utilization of existing resources is still not optimized so that such as livestock manure and agricultural waste has not been maximized. Therefore, the purpose of this service is to provide training and practice in making organic fertilizer from livestock and agricultural waste in Kaliloka Village, Sirampog District, Brebes Regency.

Like other villages, Kaliloka faces difficulties in growing and managing livestock and agricultural waste. Improper management of these wastes can lead to environmental contamination and act as breeding grounds for diseases. Compostable fertilizer is one of the useful resources that can be made from agricultural waste. Composting is principally a process of weathering organic matter by microorganisms physically or chemically, weathering with the end result being plant nutrients and humus. Humus is a source of plant nutrients N, P, K, S and some micro elements (Sarief, 1986). Fertilizers made from compost not only improve soil fertility, but also empower local communities and promote sustainable agriculture.

Fertilizer application is one of the efforts that can be made to optimize the growth and productivity of a plant. Fertilizers can be divided into two types, namely inorganic fertilizers and organic fertilizers. Inorganic fertilizers are fertilizers made through chemical, physical, or biological engineering processes in factories. Organic fertilizers, on the other hand, are fertilizers that are mostly or entirely composed of organic materials derived from plants or animals, which have been processed. These fertilizers can be either solid or liquid and are used to add organic matter and improve the physical, chemical, and biological properties of the soil.

The increasing price of chemical fertilizers has made it difficult for some agricultural sectors to obtain fertilizers, so farmers choose to switch to more affordable organic fertilizers. The use of organic fertilizers is also important to reduce the negative impacts caused by chemical fertilizers, in order to preserve agriculture. Excessive use of organic fertilizers can also damage soil and plants. Therefore, the use of fertilizers, both organic and inorganic, needs to be monitored with clear usage standards. The importance of adjusting the manufacture of organic fertilizers to the needs of soil and plant nutrients.

Joetono (1995) explains that in the soil, organic matter has a role in improving the physical and chemical properties of soil through structural stability, water infiltration, moisture content, drainage, temperature, microbial activity and root penetration. On soil chemical properties, in general, it affects the provision of nutrients for plants and is a source of nutrients N, P and S. (journal of organic fertilizer application)

Using bacterial decomposers, the composition method converts organic matter into nutrient-rich fertilizer for agricultural and farm waste management into compost. This method not only creates products that can increase agricultural output but also reduces the harmful effects of waste on the environment. In addition, the use of composted fertilizer helps reduce dependence on chemical fertilizers, which have adverse long-term consequences for the ecosystem and soil.

The purpose of this article is to find out and practice first-hand how livestock and agricultural waste is managed in Kaliloka Village and turned into compost. In addition, to evaluate the impact of these practices on community empowerment and increased agricultural output. Therefore, it is hoped that this article will help the village community and everyone involved maximize the potential of livestock and agricultural waste as a valuable resource by offering useful insights and suggestions.

This research had to be done quickly for a number of reasons. Firstly, managing agricultural and livestock waste into compost can help reduce the negative impact that organic waste has on the environment. Secondly, the resulting compost has the potential to improve soil fertility, which is crucial for sustainable agriculture. Thirdly, using compost can help reduce the need for chemical fertilizers, which are often expensive and have adverse long-term impacts on the soil. Fourth, by generating new income streams, composting livestock and agricultural waste helps strengthen rural economies. And [finally, composting from local waste is a great method to reduce waste and utilize resources that are already available.

2. METHODS

A. Research Methods

In this research, the ABCD method was used. The description is as follows:

1. Discovery.

At this stage, researchers conducted observations at one of the farms managed by KWT (Women Farmers Group), interviews with the head of RT 06 Dukuh Kaliloka, and one of the residents who manages independent agricultural land to coordinate about agriculture in the area and how it is managed. This was done with the aim of knowing the agricultural potential that can be developed in the area.

2. Dream

After understanding the agricultural potential and management of one of the farms in RT 06 Dukuh Kaliloka, researchers formulated the hopes that the community, especially in RT 06, Dukuh Kaliloka, wanted to realize, namely the use of compost fertilizer in managing their agricultural land so as to produce crops that are safe for consumption, save on agricultural land management costs, and reduce soil / environmental pollution. If this is implemented, the hope is also an effort to empower and support agriculture in Kaliloka Village because it reduces the use or dependence on chemical fertilizers.

Design

At this stage, researchers conduct independent research on what materials and equipment are needed in making compost fertilizer, how much time is needed to make compost fertilizer, and plan the learning stage in advance before doing direct practice. The materials that the researchers used in the activity came from local residents who were willing to distribute their farm and agricultural waste.

1. Define

After designing, researchers and residents determine how the activity will be carried out, when, where, and determine the range of compost fertilizers to be made. In addition

2. Destiny.

After conducting the assessment and design, the researchers coordinated with one of the farm owners in RT 06, Dukuh Kaliloka to carry out activities to process livestock and agricultural waste into compost fertilizer on the farm owned by the resident. The activities of processing livestock and agricultural waste into compost fertilizer are

dilaksanakan dengan bimbingan dan arahan dari warga sekitar yang memiliki pengetahuan dan pengalaman dalam pembuatan pupuk kompos.

B. Time and Place

The management of livestock and agricultural waste into compost as an empowerment and agricultural support for Kaliloka Village was carried out on Monday, July 22, 2024. This activity was carried out on a plantation owned by one of the residents in RT 06 Dukuh Kaliloka, Kaliloka Village, Sirampog District, Brebes Regency. Then monitoring or checking the mixture of livestock and agricultural waste which will later become compost was carried out on Wednesday, July 31, 2024 and Wednesday, August 7, 2024.

C. Tools and Materials

1. Tools

The tools needed to make compost fertilizer are as follows:

- a. Hoe
- b. Chopper or cleaver
- c. Bucket
- d. Plastic sheeting
- e. Stirrer
- f. Scoop
- g. Tank for spraying (optional)

2. Materials

The materials needed to make compost fertilizer are as follows:

- a. Farm waste (goat manure)
- b. Agricultural waste (straw, rice husk, grass/ilalang, banana leaf/vegetable residue)
- c. EM4 activator
- d. Molasses
- e. Water

D. Activity steps

The activity of managing livestock and agricultural waste into compost is carried out through three stages, namely: planning stage, implementation stage, and monitoring stage.

1. Planning Stage

In the planning stage, researchers conducted an interview with the head of RT 06 Dukuh Kaliloka to coordinate with residents who were targeted by the management of livestock and agricultural waste into compost. As well as coordinating the time and place for the implementation of these activities.

2. Implementation Phase

This activity begins with collecting goat manure from a goat farm owned by one of the local residents who volunteers or is willing to distribute his farm waste for the agricultural empowerment of local residents. Then proceed with mixing the collected manure with agricultural waste in the form of chopped weeds, merang or husks from rice plants taken from the Bungaloka plantation owned by the local neighborhood, chopped banana leaves and vegetable scraps. The mixing of livestock waste and agricultural waste is done with a ratio of 1:2, where livestock waste is 1 compared to 2 agricultural waste. After mixing and stirring evenly, the mixture is then added with a liquid consisting of agricultural EM4 activator, molasses, and water. The liquid was mixed with 5 liters of water mixed with EM4 activator at the rate of 1 cup or equivalent to 240 ml and molasses at the same rate as EM4. After that, the mixture containing livestock and agricultural waste was watered with the liquid containing water, EM4, and molasses while stirring evenly. After everything is evenly mixed, the mixture is tightly covered with a tarpaulin so that no air comes in or out of the mixture area. The fermentation process of the mixture that has been made takes approximately 22 days to 1 month, some even up to 2 months.

1. Monitoring Stage

Monitoring activities must be routinely carried out in the range of 5-7 days. This monitoring activity consists of checking the mixture of livestock waste and agricultural waste to determine the level of humidity. In this case, researchers accompanied by residents of the plantation landowners conduct monitoring once a week to check the fermentation process and the moisture level of the compost that

has been made. If the mixture has a low moisture level or is dry, then the mixture must be watered again with a mixture of water, molasses, and EM4.

3. RESULTS AND DISCUSSIONS

During this service period, researchers conducted two monitoring of the mixture of livestock and agricultural waste that will become compost fertilizer. Researchers conducted monitoring or checking on July 31 and August 7, 2024. During the last monitoring, researchers consulted local residents who were experienced and helped researchers from the beginning in processing livestock and agricultural waste into compost that the fertilizer made had shown good progress, agricultural waste had decomposed, but the humidity level was quite low so that every time they checked it needed to be watered again with a mixture of EM4, molasses and water. The re-watering process should be done every 3-4 days once for approximately 2-3 weeks. The process also adjusts the moisture condition of the waste being processed. In addition, the mixture that will become compost fertilizer needs to get access to air even a little to help the fermentation process.

In addition, based on the community service activities that researchers have carried out, researchers gained knowledge, understanding as well as direct practice on how to make compost from livestock and agricultural waste, how to manage agricultural land, care for plants, how to make biosaka fertilizer made from several types of wild plants around community farms that are easy to make and have proven their benefits for plant growth. In addition, researchers are actively involved in community empowerment activities through KWT (Kelompok Wanita Tani) which is also a place where researchers learn to manage and care for agricultural land, as well as the harvest which is distributed for mutual benefit in Kaliloka Village, especially in RT 06, namely in Dukuh Kaliloka. The activities that researchers have carried out if implemented or applied in the management of agricultural land owned by residents have good long-term benefits, namely plants that are consumed are safer because they use fertilizers derived from organic ingredients, reduce soil and environmental pollution, save agricultural land management costs, and empower local residents through the use of materials derived from livestock and agricultural waste owned by residents for making compost.

It is very concerned when nature has provided materials to support soil fertility but awareness and utilization are not optimal. Even though this is a pattern that nature has provided for soil fertility itself. This concern is what arises in some community members to support each other and become aware of the use and use of organic fertilizers again. This organic fertilizer will provide benefits that can not only be felt in the present, but also provide long-term fertility benefits. Although the effectiveness of organic fertilizers cannot be maximized to eradicate existing pests, it can maintain soil fertility and encourage more effective and healthy agricultural growth. Therefore, in agriculture that has been carried out by residents of Kaliloka Village, it is not effective if it uses 100% organic fertilizer, but also still uses chemical fertilizers as a pest repellent. This shows the existing emphasis on chemical fertilizers that will have an impact on the long term, namely barren soil.



Figure 1. First week monitoring



Figure 2. Monitoring week two

From the steps that researchers have taken, it gives optimal results, meaning that it is in accordance with what should be produced. This gives an attraction to the community to cultivate organic fertilizer from agricultural and livestock waste. Because basically this organic fertilizer is very useful for improving and maintaining the fertility of

agricultural land. However, the lack of awareness of the surrounding community of the benefits of this organic fertilizer makes the mindset of the surrounding community rarely use this organic fertilizer. On the other hand, residents consider a long time in making the need for this fertilizer, causing fertilizer stocks to often experience vacancies which will also result in hampering the management of agricultural land, but residents have also been spoiled with chemical fertilizers that have been sold in the local market. With the program **“Management of Livestock and Agricultural Waste into Compost Fertilizer as Empowerment and Support Agriculture in Kaliloka Village”** It is an educational tool for the local community that not only educates with theory but also uses hands-on practice. This program is also a form of education to utilize the natural resources and potential that exist in Kaliloka Village. Basically, the utilization of natural resources that are already available directly will be more effective in increasing the potential of the village. With education and direct practice, it is hoped that it can be accepted and implemented by the Kaliloka Village community in order to utilize existing natural resources and can support the village's potential in the agricultural sector.

This activity also requires a successor to distribute the compost that researchers have made. This has been coordinated with the head of the local RT and with Mr. Salafuddin as the mentor of the program. With this successor, it provides an educational step that does not only stop when researchers carry out kkn activities in Kaliloka Village. So that in the future this program activity will be a form of awareness of the local community to better utilize existing natural resources as the manufacture of organic fertilizer which will support the potential of this village.

4. CONCLUSIONS

Managing livestock and agricultural waste into compost is actually quite easy to do. However, it requires tenacity and patience in monitoring the progress of the fertilizer every week, especially since the process of making compost takes quite a long time. Pay attention to the moisture level every time you check, and water it using a liquid consisting of water, EM4 activator and molasses to keep the mixture of livestock and agricultural waste moist. Still provide a little air access to help the fermentation process run optimally. The management of livestock and agricultural waste into compost is very beneficial for the empowerment and support of residents' agricultural

land to be better, because compost is a fertilizer produced from natural or organic materials that are safe to use. In addition, it can also reduce residents' dependence on the use of chemical fertilizers that can have long-term effects, namely damaging or polluting the soil ecosystem. Although it is easy, there is a need for counseling, education and raising awareness of residents to manage their agricultural land in ways that are safe and still maintain the environmental ecosystem. Although the processing takes a long time, the utilization of livestock and agricultural waste into compost can save expenses for agricultural land management because it utilizes materials that are already available. The processing of livestock and agricultural waste into compost will be better done in a place that is far from residential areas, because at the beginning of the fermentation process it will produce a quite pungent aroma due to the decay of the ingredients that have been mixed.

REFERENCES

Agustrina, Rochmah, Eti Ernawati, Gina Dania Pratami, and Dzul Fithria Mumtazah. 2023.

“Pengolahan Limbah Organik Rumah Tangga Berbasis Eco-Enzyme Dalam Upaya Meningkatkan Kesehatan Lingkungan Dan Perekonomian Masyarakat Di Kelurahan Korpri

Jaya, Sukarame, Bandar Lampung.” *Buguh: Jurnal Pengabdian Kepada Masyarakat*.3(1): 19–26.

Astuti, Agung, and Hariyono Hariyono. 2018. “Pelatihan Dan Pendampingan Kelompok Wanita Tani Untuk Pembuatan Kompos Dengan Bioaktivator Mol Dan Dikelola Melalui Bank Kompos.” *Jurnal Bakti Saintek: Jurnal Pengabdian Masyarakat Bidang Sains dan Teknologi* 2(1): 37.

Astuti, Sri Juni Woro, Esa Wahyu Endarti, and Heri Susanto. 2021. “Ppm Pemanfaatan Limbah Ternak Kambing Menjadi Pupuk Kompos.” *Prosiding Konferensi Nasional Pengabdian Kepada Masyarakat dan Corporate Social Responsibility (PKM-CSR)* 4: 902–10.

Dewanto, Frobel G., Jola J.M.R. Londok, Ronny A.V. Tuturoong, and Wilhelmina B. Kaunang.

2017. “Pengaruh Pemupukan Anorganik Dan Organik Terhadap Produksi Tanaman Jagung Sebagai Sumber Pakan.” *Zootec* 32(5): 1–8.

- Fitria, Laksmindra et al. 2024. "Pendampingan Pengolahan Sampah Organik Menjadi Pupuk Kompos Dan Pupuk Kandang." *JMM (Jurnal Masyarakat Mandiri)* 8(1): 818.
- Kastolani, Wanjat, Fitri Rahmafitria, Ghoitsa Rohmah Nurazizah, and U Supriatna. 2022. "Pelatihan Pemanfaatan Limbah Ternak Untuk Pertanian Tanpa Olah Tanah Di Desa Sukamaju Kecamatan Cimaung Kabupaten Bandung." *Jurnal Abmas* 22(2): 103-110.
- MAMILIANTI, WENNY, and FARIS FARIS. 2017. "Pemberdayaan Masyarakat Dalam Pengolahan Sampah Pasar Dan Limbah Ternak Menjadi Biogas Dan Kompos Di Desa Gerbo Kec. Purwodadi Kab. Pasuruan." *Jurnal Terapan Abdimas* 2(3): 8.
- Mulyani, Reni, Devi Indah Anwar, and Neneng Nurbaeti. 2021. "Pemanfaatan Sampah Organik Untuk Pupuk Kompos Dan Budidaya Maggot Sebagai Pakan Ternak." *JPM (Jurnal Pemberdayaan Masyarakat)* 6(1): 568-73.
- Murdiono, Achmad, NURIL FIQIH AL QOMARU, and NAUFAL FALIH ROSYADI. 2021. "Pengolahan Pupuk Organik Dari Limbah Pertanian Dan Peternakan Menggunakan Metode Pengomposan Di Desa Tenggiring, Kecamatan Sambeng, Kabupaten Lamongan." *Jurnal Graha Pengabdian* 3(4): 306.
- Nurhayati, A J, and R S Anggraini. 2014. "Potensi Limbah Pertanian Sebagai Pupuk Organik Lokal Di Lahan Kering Dataran Rendah Iklim Basah. ." *Iptek Tanaman Pangan* 6(2): 193-202.
- Ratriyanto, Adi et al. 2019. "Pembuatan Pupuk Organik Dari Kotoran Ternak Untuk Meningkatkan Produksi Pertanian." *SEMAR (Jurnal Ilmu Pengetahuan, Teknologi, dan Seni bagi Masyarakat)* 8(1): 9-13.
- S, Bernadetta Anita Jerry, Ernie Shinta Y S, Darwin S H Damanik, and Dameria Naibaho. 2021. "Jurnal Ilmiah MADIYA Masyarakat Mandiri Berkarya Pemanfaatan Limbah Pertanian Dan Peternakan Sebagai Pupuk Kompos." *Jurnal Ilmiah MADIYA: Masyarakat Mandiri Berkarya* 2(2): 125-31.
- Widyanto, H. "Pemanfaatan Limbah Peternakan Sapi Sebagai Pupuk Organik Untuk Meningkatkan Produktivitas Tanaman Kelapa Sawit." *Repository.Pertanian.Go.Id* (1).

<http://repository.pertanian.go.id/handle/123456789/14694>
[http://repository.pertanian.go.id/bitstream/handle/123456789/14694/Bul.
%286%29.pdf?sequence=1&isAllowed=y.](http://repository.pertanian.go.id/bitstream/handle/123456789/14694/Bul.%286%29.pdf?sequence=1&isAllowed=y) Vol. 7 no. 1