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Training On Organic Waste Management Into Liquid Fertilizer To Improve Residents' Economy

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Abstract: The training activity on managing organic waste into fertilizer was carried out as an effort to empower the community of RT 02 RW 01 Pematang Gubernur Village in improving family economy while reducing the volume of household waste. Organic waste, which generally comes from food scraps and kitchen waste, has great potential to be processed into liquid fertilizer that has economic value. This training aims to provide understanding and practical skills to residents in processing organic waste in a simple and sustainable way. Training methods include counseling, demonstrations, and direct practice. The results of the activity showed an increase in knowledge and ability of residents in producing liquid fertilizer, as well as the emergence of initiatives to sell processed products as an additional source of income. Thus, this training contributes positively to increasing environmental awareness and empowering the local community's economy.

Keywords:*Training, Organic Waste, Liquid Fertilizer.*

INTRODUCTION

The problem of waste, particularly organic waste, is an increasingly pressing environmental issue that requires systematic and sustainable addressing. According to data from the Ministry of Environment and Forestry (KLHK), approximately 60% of the total waste generated in Indonesia is organic waste, consisting of food scraps, kitchen waste, leaves, and other organic materials. Unfortunately, most of this waste still ends up in landfills (TPA) without adequate recycling or processing. This not only causes environmental pollution but also wastes the enormous potential it holds.

According to Suharti (2020), organic waste contains high levels of nutrients such as nitrogen, phosphorus, and potassium, which are essential for plant growth. Therefore, if properly processed, organic waste can be converted into environmentally friendly and economically valuable liquid fertilizer. Liquid organic fertilizer has been shown to improve soil fertility and plant productivity, while reducing dependence on chemical fertilizers, which are relatively expensive and have negative long-term environmental impacts.Furthermore, According to Santosa (2018), participatory organic waste management at the household and community level can create new jobs, foster social entrepreneurship, and strengthen the local economy. This activity also supports the concept of a circular economy, an economic system that aims to minimize waste and maximize resource reuse.

In the context of community empowerment, utilizing organic waste as liquid fertilizer has a dual impact: on the one hand, it reduces environmental burdens, and on the other, it creates a business opportunity that can increase residents' incomes. Amidst uncertain economic

conditions and increasing demand, Based on our direct observations in RT 02, there are a number of serious problems related to waste management. Some of the main issues identified include:

1. Continuously Increasing Waste Volume
   Residents of RT 02, Pematang Gubernur Village, Bengkulu produce large amounts of waste every day. Lack of awareness about reducing household waste makes the volume of waste continue to increase and makes it difficult to manage.
2. Lack of Waste Sorting
   Most residents are not accustomed to separating organic and inorganic waste. As a result, all types of waste are mixed together and simply discarded, making recycling or composting difficult.
3. Lack of Facilities and Infrastructure
   Waste management facilities such as separate bins, composters, or waste banks are still very limited in RT 02, thus preventing good waste management practices.
4. Lack of Education and Public Awareness
   Many residents do not understand the long-term impacts of poor waste management, such as environmental pollution, flooding, and health problems.
5. Health and Environmental Issues
   Poorly managed waste accumulations produce unpleasant odors and become breeding grounds for mosquitoes, rats, and other pests that can cause disease.

Therefore, we, the KKN-T students at Dehasen University, Bengkulu, took the initiative and developed the idea of conducting outreach training on waste. We believe that waste is not simply something to be thrown away; it can be utilized to benefit residents by converting organic waste or kitchen waste into liquid fertilizer.

RESEARCH METHODS

This activity was implemented through a participatory method with an educational and applied approach, designed to actively involve the community in the training and implementation process of managing organic waste into liquid fertilizer. This Thematic Community Service Program (KKN-T) was held in RT 02/RW 01, Pematang Gubernur Village, Muara Bangkahulu District, Bengkulu City. The program ran from June 11 to July 4, 2025. This research was applied research, aiming to provide direct solutions to the residents' environmental and economic problems. The approach used was participatory and educational, with residents involved in all stages of the activity, from planning and training to evaluation. Socialization was the initial activity of the community service program, encompassing site surveys, permits, preparation, and, most importantly, socialization. The socialization was attended by participants and the head of RT 02. The purpose of this socialization was to ensure residents understood the purpose of the training, which focused on making organic fertilizer from household waste and provided guidance in its production. The outreach activities also explained the stages of fertilizer production.

Figure 1. Flowchart of training activities

The observation phase involved a direct inspection of the activity site and the collection of vegetable waste. The theoretical phase involved presenting the basic study and advantages of making liquid organic fertilizer to the community in RT 02 Pematang Gubernur. The phases included field observation, activity materials (theory), product objectives, implementation, and evaluation of the processing of vegetable waste into liquid organic fertilizer, as follows:

a) Field Observation: During the observation phase, the Community Service Program (KKN-T) Team from RT 02 Pematang Gubernur Village visited the surrounding community in RT 02, Pematang Gubernur Village, Muara Bangkahulu District, Bengkulu City. The purpose of the observation was to identify community issues, potential organic waste processing, and the residents' economic situation.
b) Theoretical Phase: The theoretical presentation of the liquid organic fertilizer material was conducted by the KKN-T Team from Dehasen University, Bengkulu, and was conducted by residents of RT 02 Pematang Gubernur.
c) Product Target Phase: The target group for processing organic waste into liquid organic fertilizer was the community surrounding RT 02 Pematang Gubernur, Bengkulu. d) The implementation stage of the liquid organic fertilizer production practice was held in the yard of the KKN-T Group 4 Post of Dehasen University, Bengkulu, on Monday, July 1, 2025. The KKN-T Team, RT 02, Pematang, Governor, Bengkulu.
d) Evaluation Stage: Monitoring activities and evaluating the liquid organic fertilizer production program in RT 02, Pematang, Governor, Bengkulu City.

Prior to the socialization and practice of making liquid organic fertilizer to improve the economy of residents, the KKN-T Team of Dehasen University, Bengkulu, conducted independent practices. During the fermentation process, the product was selected within 7-14 days in advance so that it could be distributed to the surrounding community of RT 02, RW 01, Pematang, Governor, Bengkulu City.

RESULTS AND DISCUSSION

The Thematic Community Service Program (KKN-T) conducted by Dehasen University, Bengkulu, in RT 02 RW 01, Pematang Gubernur Village, Bengkulu City, aimed to provide solutions to two key issues facing the community: suboptimal management of household organic waste and limited sources of additional income. Training on processing organic waste into liquid fertilizer was designed to address both issues with an educational, practical, and sustainable approach. Based on initial observations and interviews with local residents, it was discovered that most household waste, particularly organic waste such as food scraps, dry leaves, and kitchen waste, is

still simply disposed of in landfills or burned, causing air pollution and potential environmental damage. Furthermore, most residents are unaware of the economic potential of organic waste management. Economic issues are also a key focus, particularly for housewives and unemployed individuals of productive age. This serves as the primary basis for the training, which aims to improve economic well-being through waste management with marketable value. The training was conducted in several stages, starting with outreach, material delivery, a demonstration of liquid fertilizer production, hands-on practice by residents, and evaluation of the results.
The training materials included:

- An introduction to the types of organic waste and the benefits of managing them.
- An explanation of the stages of liquid fertilizer processing, from sorting organic waste, shredding, mixing ingredients (brown sugar, water, and EM4), fermentation, and filtering.
- The fermentation process was opened once a week every three days to allow the gas to escape and prevent explosions.

Figure 2 Introduction to types of organic waste

- Carrot and potato peels
- Benefits: Stimulates root and stem growth.
- Outer leaves of cabbage/mustard greens
- Benefits: Helps microbes thrive because they are rich in green organic matter.
- Vegetable tubers
- Benefits: Serves as a filler in fermentation.
- Wilted vegetable scraps
- Benefits: Increases the volume of fermented ingredients and enriches the nutritional variety.

Table 1. Details of measuring the amount of fertilizer mixture

Material	Percentage %
Molasses	2 tbsp
Rubbish Organic	Vegetable Leftovers
EM4	10 ml
Rice Water	2 liters

- Prepare a container (used paint bucket)
- Chop all prepared organic or household waste and place it in a large container.
- Prepare 2 liters of rice water. Then, pour it into the container containing the waste.
- Next, add 10 ml of EM4 and 2 tablespoons of molasses. Mix them into the bucket containing the organic waste and water.
- Stir until evenly mixed. Then, continue the fermentation process.

STAGE 3: Fermentation and Harvesting of Liquid Fertilizer:

After processing the ingredients, the liquid fertilizer continues to a one-week fermentation process. The fermentation process must be opened every three days to release the gas contained within to prevent explosions. After one week of fermentation, the liquid fertilizer from organic waste is filtered and bottled, ready for use.In this training, we also hope to assist local residents in utilizing local waste by making liquid fertilizer from organic waste. This can also be used as a form of business success, generating income to improve the local economy. Economics

According to Hamroli Harun, potential is defined as an economic capacity in a region that is feasible and feasible to be developed, becoming a source of livelihood for local people and even driving the overall regional economy to develop sustainably (Malombeke, 2016). "From an economic perspective, waste has significant potential if managed efficiently and effectively. Scavengers, collectors, and recyclers manage their waste with assistance and guidance" (Istiqomah, Rahayu, and Ekawanti 2011). The economic potential of waste utilization can be used as an alternative source of funding for waste management. To date, the organic waste processed by the PD Kebersihan (Cleanliness Department), neither compost nor biodigester products, has been sold commercially. The compost is utilized by communities in need through proposals submitted to PD Kebersihan. Compost is also used as fertilizer for trees around the TPS (landfill site). Furthermore, the economic potential of utilizing inorganic waste is also relatively large (Indartik et al. 2018).

"An effort to utilize waste for the community is said to be successful if the resulting product is useful for the community and has economic value, so it sells. Likewise, with various products resulting from waste processing, the benefits will be felt if they can be felt by the wider community and have high economic value, so that they can help the economy of communities whose livelihoods depend on scavenging for waste in existing landfills" (Latuconsina and Rusydi

Figure 3. Process Of Making Liquid Fertilizer And Mixing Ingredients

Figure 4. Documentation of training activities for making liquid fertilizer

CONCLUSION

The results of the activity showed an increase in the knowledge and ability of residents in producing liquid fertilizer, as well as the emergence of initiatives to sell processed products as an additional source of income. Thus, this training contributed positively to increasing environmental awareness and economic empowerment.

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