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The composition of main ingredients of eco-enzyme is agricultural waste or household waste and a solution resulting from the fermentation of household waste by adding water and brown sugar cane/palm sugar. Organic waste, such as the skin of apples, oranges, pears, or vegetables that do not have hard skins, is put into bottles or containers with lids. Before being put into the container, the waste can be chopped first to speed up the fermentation process, then add water and brown sugar. The fermentation process takes a long time of about three months and requires regular checks. The benefits of eco-enzymes are not only in agriculture but can also be useful for cleaning polluted water bodies (Penmatsa et al., 2019); anti-fungal, anti-bacterial, and insecticidal agents (Vama & Cherekar, 2020). This is because the eco enzyme can accelerate biochemical reactions inside to produce valuable enzymes such as amylase, lipase, and protease and have inhibitory power against E. coli and S. aureus bacteria (Farma et al., 2022). This encourages the community service team to increase public knowledge about using organic waste in eco-enzymes because this activity supports the concept of reuse in saving the environment. It is hope that after the community service team carries out education on the use of organic waste, processing organic waste at the source of the waste, which is carried out consistently and continuously, is believed to be able to solve waste problems from an early age. Enzymes from this "garbage" are one way of waste management that utilizes kitchen scraps to produce valuable liquids.

2. Methods

This community service is carried out through three stages: preparation, implementation, and final.

2.1 Preparation phase

This stage includes collecting secondary, primary, and current materials and doing modules for sorting and utilizing organic waste. Secondary data includes a map of the location of RT o4 RW o5 Permata

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Is it community service article?

Reply

Research Article

ORGANIC SOLID WASTE MANAGEMENT BY PRODUCING ECO-ENZYMES FROM FRUIT SKIN IN PERMATA TEMBALANG

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Abstract

Population growth and increasing consumption patterns are the main factors that cause the waste production rate always continue to grow. The Ministry of Environment and Forestry in 2020 estimates that waste dumps in Indonesia will be 67.8 million tons. However, organic waste management in Indonesia is still relatively low. The accumulation of organic waste in the landfill, which usually causes unpleasant odors and can potentially cause an explosion due to the production of methane gas from natural decomposition processes, can be avoided by prioritizing waste management from the source. An alternative way to to handle organic waste is to make eco-enzymes. Making Eco-Enzyme from the organic waste of fruit peels and vegetable residues is increasingly popular and widely developed because it is efficient, economical, and environmentally friendly. This is the focus of the community service team. The community service method is carried out in three stages, including the preparation stage, the implementation stage, and the final stage. The preparation stage consists of doing a module for sorting organic waste and its utilization (making eco-enzymes). The next phase consists of socialization, education, and training on sorting organic waste and making the right eco-enzymes. The final stage consists of evaluation and making a final report. The expected result after education, socialization, or training has been carried out by the community service team, the community members, especially RT 04 RW 05 Permata Tembalang, know better and understand the sorting and utilization of organic waste.



Waste management with a comprehensive approach from upstream, that is, before the production of products that have the potential to become waste, to downstream, when the product has become waste and is returned to the environmental media safely, should be cultivated (Septiani et al., 2021).

3 Conclusions

Based on the community service activities that have been carried out, it can be concluded that the processing of organic waste from fruit peels into Eco-Enzyme products for the residents of Anturium RT o4 RW o5 Permata Tembalang is on target and is running effectively. The activity of processing organic waste from fruit peels into Eco-Enzyme products can provide benefits, namely increasing community independence and increasing the community's active role in maintaining environmental cleanliness and contributing to dealing with waste problems.

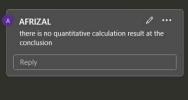
After processing organic waste from fruit peels into Eco-Enzyme products correctly, to handle waste problems, a follow-up (action plan) can be carried out in the form of an implementation survey assignment for one head of family in RT 04 RW 05 Permata Tembalang. It is necessary to consider if the manufacture of Eco-Enzyme products has been running regularly in RT 04 RW 05 Permata Tembalang. it is necessary to provide education about similar things in other RT's, either from the community or the service community team.

4 Acknowledgment

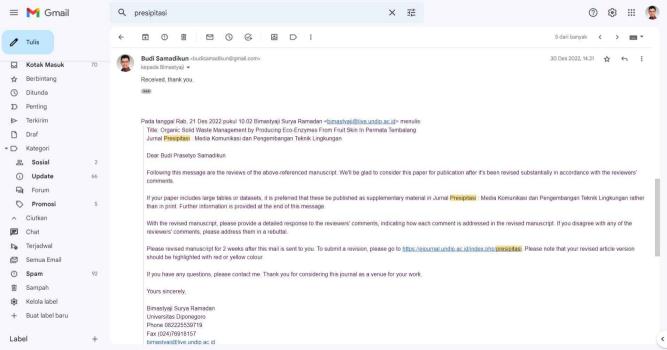
The authors want to acknowledge that the Faculty of Engineering, Diponegoro University 2022, funded this research under Strategic Research Scheme in the Fiscal Year 2022. Also to the village head and the staff, as well as the villagers of RT 04 RW 05 Permata Tembalang, who have participated in supporting this community service program.

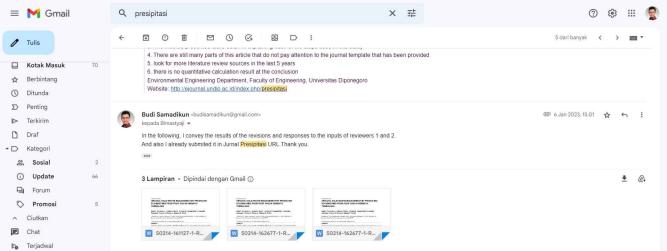
5 References

Alkadri, S.P.A. & Asmara, K.D. 2020. Pelatihan Pembuatan Eco-Enzyme sebagai Hand Sanitizer dan Disinfektan Pada Masyarakat Dusun Margo Sari Desa Rasau Jaya Tiga Dalam Upaya Mewujudkan Desa Mandiri Tangguh Covid-19 Berbasis Eco-Community. Buletin Al-Ribaath, 17: 98-103









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Methods

This community service is carried out through three stages: preparation, implementation, and final.

2.1 Preparation phase

This stage includes collecting secondary, primary, and current materials and doing modules for sorting and utilizing organic waste. Secondary data includes a map of the location of RT o4 RW o5 Permata Tembalang and the number of families. While the primary data was obtained through a survey to obtain information about the condition of the resident's garbage dumps in RT o4 RW o5 Permata Tembalang. The



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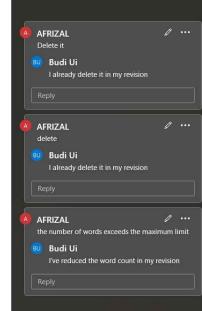
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Population growth and increasing consumption patterns are the main factors that cause the waste production rate always continue to grow. The Ministry of Environment and Forestry in 2020 estimates that waste dumps in Indonesia will be 67.8 million tons. However, organic waste management in Indonesia is still relatively low. The accumulation of organic waste in the landfill, which usually causes unpleasant odors and can potentially cause an explosion due to the production of methane gas from natural decomposition processes, can be avoided by prioritizing waste management from the source. An alternative way to to handle organic waste is to make eco-enzymes. Making Eco-Enzyme from the organic waste of fruit peels and vegetable residues is increasingly popular and widely developed because it is efficient, economical, and environmentally friendly. This is the focus of the community service team. The community service method is carried out in three stages, including the preparation stage, the implementation stage, and the final stage. The preparation stage consists of doing a module for sorting organic waste and its utilization (making eco-enzymes). The next phase consists of socialization, education, and training on sorting organic waste and making the right eco-enzymes. The final stage consists of evaluation and making a final report. The expected result after education, socialization, or training has been carried out by the community service team, the community members, especially RT of RW of Permata Tembalang, know better and understand the sorting and utilization of organic waste.

Keywords: waste, organic, recycle, eco-enzyme

1. Introduction

Population growth and the increasing consumption patterns are the main factors that cause the waste production rate always continue to grow. In addition, industrial and technological developments also contribute to increasing the amount, volume, and diversity of waste characteristics (Dewi, 2021). The



Waste management with a comprehensive approach from upstream, that is, before the production of products that have the potential to become waste, to downstream, when the product has become waste and is returned to the environmental media safely, should be cultivated (Septiani et al., 2021).

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After processing organic waste from fruit peels into Eco-Enzyme products correctly, to handle waste problems, a follow-up (action plan) can be carried out in the form of an implementation survey assignment for one head of family in RT o4 RW o5 Permata Tembalang. It is necessary to consider if the manufacture of Eco-Enzyme products has been running regularly in RT o4 RW o5 Permata Tembalang. it is necessary to provide education about similar things in other RT's, either from the community or the service community team.

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