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EMPOWERMENT OF THE TAPAK GEDUNG VILLAGE COMMUNITY IN KEPAHIANG REGENCY (BENGKULU) THROUGH PROCESSING ORGANIC WASTE INTO A MULTIPURPOSE ECO-ENZYME

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Abstrak

Tapak Gedung Village, Kepahiang Regency (Bengkulu) has a problem with waste. So far, the organic waste produced by the community is simply thrown away into the surrounding environment. One alternative solution that can be done to reduce environmental pollution caused by organic waste is to manage the organic waste into a multipurpose eco-enzyme. This community service activity is carried out with the aim of increasing the understanding and skills of the Tapak Gedung Village community in making multipurpose eco-enzymes. The activity method is carried out in several stages, namely training, mentoring, monitoring and evaluation. This activity was carried out in August 2022 with 30 participants. The results of the activity evaluation showed that this activity had increased the participants' understanding and skills in making eco-enzymes with an N-gain of 0.85 or high criteria, which means that this activity was effective. The results of the training participant satisfaction survey showed that the activity participants were satisfied with the activities carried out and felt that the activities provided were appropriate according to the needs of the community.

Keywords: Eco Enzyme, Empowerment, Organic Waste.

INTRODUCTION

Tapak Gedung is one of the villages in Kepahiang Regency, Bengkulu Province. Tapak Gedung Village is one of the old villages in Kepahiang Regency. This village is inhabited by the Serawai people with the majority of the livelihoods of the population being farmers and ranchers (90%), 10% are employees and traders. According to the 2018 BPS, the Kepahiang Regency area has an area of 71.92 km2 with a population of 134,938 people with a weight of 68,300 kg of waste transported to the landfill/day. Many community activities, high birth rates, lack of public awareness of waste management are factors that trigger more and more waste generation in Kepahiang Regency so that proper waste management is needed

Waste is material that is not used, is not used, is not liked, or is something that is thrown away that comes from human activities (Batubara et al., 2022). According to the law of the Republic of Indonesia Number 18 of 2008 waste is the residue of daily human activities and/or natural processes in solid form. Garbage is the result of human activities that have been produced since humans started life in society from the smaller to the larger (Atalia et al., 2015). Garbage consists of organic (easily decomposed) waste such as food scraps, leaves, meat, while

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non-organic (non-decomposing) waste such as plastic, paper, used building materials (Anatolia et al., 2015). Garbage becomes waste which is a consequence of all human activities. If there is no community capacity in waste management, waste can cause environmental problems (Yogiesti et al., 2010). The amount and type of waste really depends on the lifestyle and the type of material we consume, the more the economy in the household increases, the more varied the amount of waste produced (Subekti, 2010). This resulted in the waste that has been produced every day is still not considered. The higher the number of residents and their activities, the volume of waste continues to increase. As a result, dealing with waste requires a lot of money and an increasingly large area of land. Besides that, of course waste endangers health and the environment if it is not managed properly (Sujarwo et al., 2014).

One effort to overcome these environmental problems can be done with waste treatment. According to Syafrudin (2004), one alternative that can be done to unravel the occurrence of environmental pollution is implementing community-based waste management programs, such as implementing 5 R (Reduce, Reuse, Recycling, Recovery, Replacing). One way that can be done with the 5R principle is by treating waste, especially household organic waste, with a multipurpose ecoenzyme. Ecoenzyme multipurpose uses raw materials that are easily available, for example, household organic waste and agricultural student products. The fermentation process lasts for 3 months and produces a solution that has many benefits. In the fermentation process O3 gas is continuously produced which is needed by the earth's atmosphere. Multipurpose eco-enzyme solution when mixed with water will react and can be used as a cleaning fluid ranging from dishwashing soap, disinfectant, cleaner, and floor freshener with the result that the floor does not become slippery even if you don't use soap. While the organic waste left over from fermentation can be used as a good organic fertilizer (Megah et al., 2018). Therefore, the multipurpose ecoenzym really needs to be known by the public. Community empowerment through appropriate innovation is needed in helping with one of the ways to carry out the 5 R principles, namely by processing waste, especially household organic waste, with a multipurpose eco enzyme

The benefits of Ecoenzyme include: Agriculture (to water plants and improve the quality of fruit on horti crops), livestock (Removes the fishy smell in the aquarium while making fish healthy), Household (washing fruit from pesticide residues, cleaning the floor of the house, etc.), health (Relaxation by soaking your feet in warm water that has been mixed with EE, purifying the air in the room, cleaning your body, mouthwash, natural hand sanitizer, etc.), and many other benefits from eco enzyme.

Multipurpose ecoenzyme can be carried out on a household scale because it is produced from the fermentation of leftover vegetables and fruits with brown sugar as a substrate. The principle of the process in making multipurpose ecoenzyme itself is the same as making compost, but water is added as a medium for the growth of good bacteria so that the final product obtained is in the form of a liquid. The advantage of this multipurpose ecoenzyme is that it does not require a large area of land for the fermentation process, and this product does not even require a composter tub. Bottles of used mineral water and other used products can be reused as multipurpose ecoenzyme fermentation tanks. Multipurpose ecoenzyme can be carried out on a household scale because it is produced from the fermentation of leftover vegetables and fruits with brown sugar as a substrate. The principle of the process in making multipurpose ecoenzyme itself is the same as making compost, but water is added as a medium for the growth

of good bacteria so that the final product obtained is in the form of a liquid. The advantage of this multipurpose ecoenzyme is that it does not require a large area of land for the fermentation process, and this product does not even require a composter tub. Bottles of used mineral water and other used products can be reused as multipurpose ecoenzyme fermentation tanks.

The majority of the people in Tapak Gedung Village work as farmers. This agricultural activity produces quite a lot of waste. Apart from that, during a pandemic like this, many residents of Tapak Gedung Village prefer to spend their time at home. This causes the consumption of vegetables, fruits to maintain the body's immunity to increase. With the increased consumption of vegetables and fruits, more and more household organic waste will be produced. Meanwhile, the community does not have sufficient knowledge and skills to manage organic waste. As a result, organic waste becomes unusable. To overcome the problem of the large amount of waste, the community empowerment of Tapak Gedung Village, especially housewives, is to increase productivity through innovative processing of household organic waste into products in the form of "ecoenzyme multipurpose" as an environmentally friendly disinfectant, cleaner and floor freshener product. Through this activity it is hoped that it will provide applied skills to the community in utilizing waste, and even has the potential to become additional income through the home industry.

ACTIVITY METHOD

This community service activity was carried out in Tapak Gedung Village, Tebat Karai District, Kepahiang Regency for 3 months. The methods used in carrying out this service activity are training, mentoring, monitoring and evaluation. The stages carried out are, (1) preparation (coordinating and collecting the main ingredients and supporting materials for making ecoenzyme), (2) training for making ecoenzyme through direct practice in groups, (3) Assistance (facilitating and guiding if participants experience problems), and (4) monitoring and evaluation. Evaluation of community service activities is carried out by conducting a post-activity analysis, namely evaluating the resulting ecoenzyme and conducting a pre-test and post-test using a questionnaire sheet.

RESULTS AND DISCUSSION

Community service activities training on processing organic waste into Eco Enzym Multipurpose for the Tapak Gedung Kepahiang Village community have been carried out Training on making ecoenzyme was carried out on 5 - 6 August 2022 at the Village Head's house with participants consisting of 30 housewives . The training activities took place with the opening, delivery of material, dividing the participants into 5 groups. Each group practiced making 30 L of ecoenzyme by: sorting vegetable and fruit waste that was still good and not rotten, washing garbage, cutting, melting brown sugar and mixing it with garbage and water in a 60 liter capacity bucket (Figure 1). At the end of the training, 4 buckets of ecoenzyme were obtained which were ready to be incubated for 3 months.

Figure 1. Practical activities for making eco enzyme

After incubation for 3 months, the resulting eco enzyme product was filtered and packaged (Figure 2). The eco enzyme liquid obtained is brown and light brown in color, has a typical sour aroma of fermentation. This indicates a successful eco enzyme fermentation process. The difference in the color of the eco enzyme produced is due to the difference in the composition of the organic waste used (Nurlatifah et al., 2022). In this activity the waste used mainly comes from vegetables and fruits with a non-uniform composition, resulting in different colors of the eco enzyme produced.

Figure 2. Screening and packaging of eco enzyme products

Eco enzymes have many benefits such as being used as a plant growth factor, a mixture of floor cleaning detergents, cleaning pesticide residues, descaling and lowering the temperature of car radiators (Astuti et al., n.d., 2020) Enzymes are produced through the fermentation of a mixture of brown sugar, kitchen wastewater or fresh vegetables and fruit

waste. According to Tang and Tong (in Astuti et al., n.d., 2020) this process takes 3 months. The application of waste enzymes to several characteristics of wastewater has been demonstrated in recent years. Waste enzymes play an important role to achieve degradation similar to the performance of commercial enzymes.

During fermentation, carbohydrates are converted into volatile acids and besides that, the organic acids present in the waste material also dissolve into the fermentation solution because the pH of the waste enzymes is acidic in nature. Waste enzymes have the highest power to reduce or inhibit pathogens because the acidic nature of the waste enzymes helps extract extracellular enzymes from organic wastes into solution during fermentation. In the fermentation process glucose is broken down to produce pyruvic acid. Pyruvic acid under anaerobic conditions will undergo decomposition by pyruvate decarboxylase into ethanol and carbon dioxide, where the Acetobacter bacteria will convert alcohol into acetaldehyde and water which will then be converted into acetic acid (Astuti et al., n.d., 2020).

The training activities went smoothly. The participants were very enthusiastic about participating in the training activities. Evaluation of the participant's understanding of the material and skills was carried out using a questionnaire. The results of the questionnaire assessment showed that there was an increase in the participants' understanding of the material and skills with an N-gain of 0.85 or with high criteria. In addition, the participant satisfaction questionnaire stated that participants needed training on making this ecoenzyme and found this training very useful and effective.

In the process of making ecoenzymes, knowledge is a very important domain for the formation of one's actions, waste management is closely related to one's intellectual knowledge is one's ability to remember something (idea phenomenon) that has been taught (Lestari & Azkha, 2010). Respondents' knowledge about waste management is built based on the ability to think according to the reality that respondents see and find in the environment around them (Jasmawati et al., 2012). Reducing waste or waste at the source of this aspect is focused on reducing the amount of waste as much as possible, because of the percentage, but also in our homes everyone has to make their own contribution (Jovicic et al., 2009). Ecoenzymes are perhaps the best known and the best received of all waste management modalities including households. Often it is not realized that organic waste is very numerous and has a more useful value.

The active participation of the community in household waste management will determine the success of its implementation. Communities need to be empowered with all kinds of non-instructive efforts to increase the knowledge and skills of the community to be able to identify problems, plan and carry out problem solving by utilizing the potential of the local community without relying on external assistance. The pattern of community empowerment that is needed is not an activity that is top-down intervention in nature which does not uphold the aspirations and potential of the community to carry out self-help activities, but what is most needed by the lower strata of society, especially those living in villages, is an empowerment pattern that is bottom-up intervention in nature. It starts with appreciating and acknowledging that the lower strata of society have the potential to meet their needs, solve their problems, and are able to carry out productive endeavors with the principles of self-help and togetherness.

The most effective approach pattern for empowering the community is the inner resources approach. This pattern emphasizes the importance of stimulating people to be able to identify

their own wants and needs and work cooperatively with the government and other agencies to achieve satisfaction for them. This pattern educates people to be concerned about fulfilling and solving the problems they face by using their potential (Riswan et al., 2011). In practice, this management is carried out by all role holders or stakeholders, both the government according to their respective duties, the community and other development actors by taking into account the integration of plans and determined policies. Therefore, community-based planning as a stakeholder becomes important. Community empowerment, cooperation between residents and officials at the village level, sub-district to the city government level is needed to handle waste by reducing the volume of waste. This is based on the consideration that with community-based planning, the environmental management program will be harmonious, efficient and effective as well as a vehicle for realizing community capacity building in planning implementation from bottom up planning to reduce waste volume.

CONCLUSION

This community service activity has increased the participants' understanding and skills in making eco-enzymes with an N-gain of 0.85 or with high criteria, which means that this activity is effective. The results of the training participant satisfaction survey showed that the activity participants were satisfied with the activities carried out and felt that the activities provided were appropriate according to the needs of the community.

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