

Socialization of Household Organic Waste Utilization in Ecoenzyme Production in Suka Mulia Village, Secanggang, Langkat Regency

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Abstract

Fruit or vegetable peels are examples of organic waste that has undergone fermentation to produce eco-enzymes (EEn). Eco-enzymes products are easy to use, simple to make, and multipurpose. They can be used to clean the environment (environmental sanitation), freshen the air, clean floors, help plants become more nutrient-rich, make the soil more fertile, and clean yourself by taking a bath or brushing your teeth, among other things. Every day, people and population groups in Suka Mulia village, Secanggang sub-district, Langkat Regency, North Sumatra province, generate a significant amount of organic garbage in their homes. Consequently, educating and raising the awareness of these community groups about the need for extra information and skills in order to manage organic waste/waste. As EEn is a multipurpose product that can solve the issue of large amounts of waste or organic waste, especially in households, one of the efforts for the management of organic waste or waste requires additional information and knowledge in the form of socialization and awareness of the community group. The goal of this endeavor is to combat and preserve a clean, healthy environment, which will help to lessen the difficulties associated with environmental contamination. This socialization exercise is conducted through direct practice in addition to lecture and discussion formats. The community can benefit from the outcomes of this EEn manufacturing training by handling organic waste, household garbage, livestock waste, and agricultural waste.

Keywords: Waste, Organic, Household, Socialization

Introduction

Waste, if not managed properly, will cause serious problems. Waste is divided into two types, namely organic and inorganic waste. Most household waste is organic waste, which can

cause unpleasant odors and cause air pollution if not managed properly, so that it can cause environmental problems. Household waste management is one of the main challenges in efforts to create a clean and healthy environment in rural areas of Indonesia. Suka Mulia Village in Secanggang District, Langkat Regency, North Sumatra, is not uncommonly facing similar problems. The high volume of organic waste generated from daily household activities has the potential to cause various negative impacts on public health and environmental sustainability if not managed properly. This is not uncommon in the community in Suka Mulia Village, Secanggang District, Langkat Regency, North Sumatra Province. Langkat is a Regency located in North Sumatra Province, Indonesia and has established a Cooperation (MoU) with Universitas Pembangunan Panca Budi. Its capital is located in Stabat District. Langkat Regency consists of 23 sub-districts, 37 sub-districts, and 240 villages, with an area of 6,273.29 km² and a population of 1,030,202 people and a population density of 165 people/km². One of the innovative and environmentally friendly solutions to overcome these problems is through the utilization of household organic waste in the manufacture of ecoenzymes. Ecoenzymes are liquids resulting from the fermentation of organic waste that have various benefits, including as a natural cleaner, liquid organic fertilizer [1], natural disinfectant (hand sanitizer) [2], plant pesticide, increasing the fertility of perennial plants [3], as an insect repellent, and other functions. Eco-enzymes can also increase the crude protein value of animal feed [4]. The process of making ecoenzymes is relatively simple, cheap, and can be done by the general public by utilizing materials that are easily found in the surrounding environment. However, the awareness and knowledge of the Suka Mulia Village community regarding the potential utilization of household organic waste, especially in the manufacture of ecoenzymes, is still limited. Therefore, comprehensive socialization and education efforts are needed to improve the community's understanding and skills in processing organic waste into useful products. This article aims to describe the process and results of socialization activities for the utilization of household organic waste in the manufacture of ecoenzymes in Suka Mulia Village, Secanggang District, Langkat Regency. It is hoped that through this activity, the community can gain new knowledge and skills in managing household organic waste, while contributing to environmental conservation efforts and improving the welfare of the local community.

Literature Review

Eco-enzyme is a liquid produced from the fermentation of organic waste that has various benefits, including serving as a natural cleaner, liquid organic fertilizer [1], natural disinfectant (hand sanitizer) [2], plant-based pesticide, enhancing the fertility of perennial plants [3], acting as an insect repellent, and other functions. Eco-enzyme can also enhance the crude protein value in animal feed [4]. The process of making ecoenzymes is relatively simple, inexpensive, and can be carried out by the general public using materials that are easily found in the surrounding environment.

Ekoenzim (EEn) is the result of the fermentation of organic waste in the form of vegetables or fruits, introduced by Dr. Rosukon Poompanvong, a researcher and environmentalist from Thailand. This innovation shares a fairly large distribution for the country. Ekoenzim (EEn) is the result of fermentation of organic waste in the form of fruit or vegetable waste [5]. EEn is a multifunctional liquid that is beneficial for human life. One of its many functions is to enhance the productivity of soybean and shallot plants [6], and it can be utilized in the production of biopesticides and biofertilizers [7].

Research Methodology

The methods of implementing community service include the following:

Preparation Stage

In this initial stage, the team coordinates regarding the implementation plan for the service, including the schedule and location of the activities (Figure 1). Activities are planned in the inorganic waste-free area in Suka Mulia village, Secanggang, Langkat.



Figure 1. Coordination meeting with village officials

Stage of Implementation

The following phases are followed in the execution of the activities:

1. Getting the EEn modules and resources ready
2. EEn creation lecture and discussion

Participants receive the lecture materials (presentation) in the form of EEn training modules, which are then followed by a Q&A session and hands-on fieldwork.

- a) A talk explaining the differences between enzymes and coenzymes
- b) A talk about the process of creating coenzymes

3. An interactive practice session for converting organic waste from homes into coenzymes
a hands-on workshop with the village leaders and members of the community to create coenzymes from household or organic waste, as seen in Figure 1.



Figure 2. Activity Participants

Results

In Langkat's Secanggang district's Suka Mulia village, this service project was completed. The head of the village and other village officials were present, along with about fifteen Suka Mulia village residents and students who were performing community service. (Figure 1).

The stage of the event's implementation starts with a greeting and introduction given by the

village authorities. He conveyed his appreciation and pride at the time since Timbang Jaya Village was selected as the service initiative's target village. The material from the implementation team was then presented as the event went on (Figure 2).



Figure 3. Ecoenzyme Material Presentation

Following the material presentation, participants were invited to participate in a practice of creating Eem utilizing used plastic containers and organic waste materials, as depicted in Figure 3. The session proceeded with a Q&A session with the training attendees, as seen in Figure 4, which also serves as an assessment phase.



Figure 4. Procedure for producing eco-enzymes

At this point, the team engaged in interactive conversations about the socialization material and allowed participants to raise questions that the team would respond to. At this point, the socialization activity's degree of success was assessed. The evaluation was conducted with an emphasis on the main finding, which is that this activity is highly helpful in resolving issues with organic waste in the community. A group photo of multiple participants served as the activity's closure (Figure 5).



Figure 5. Photo with Participants

Dr. Rosukon Poompanvong, a Thai researcher and environmental observer, created the concept of ecoenzyme (EEn), a fermentation product of organic waste in the form of fruits or vegetables. For the nation, this innovation has a sizable distribution. When organic waste, such as fruit or vegetable waste, ferments, it produces ecoenzyme (EEn) [5]. EEn is a multipurpose liquid that is beneficial to human existence. Among its various uses is boosting the yield of shallot and soybean plants [6], which may also be utilized to make biopesticides and biofertilizers [7].

This product, called Ecoenzyme, is simple to use, eco-friendly, and multipurpose. It may be used to improve plant nutrition, clean the surrounding area, and clean the house. This Ecoenzyme product is safe for the environment, simple to use, easy to create, and multipurpose. It may be used to improve plant nutrition, clean the house and surroundings, maintain cage sanitation, lessen unwanted aromas, and promote plant nutrition, among other things. Everyone in society, even students in junior high and high school, can readily manufacture ecoenzyme. It is claimed to be simple to make, inexpensive because it is derived from organic waste, and easy to obtain. Using the Bio 3:1:10 principle—three parts waste to one-part molasses to ten parts water—the production of ecoenzymes only needs water and brown sugar or molasses as a carbon source. In addition to brown sugar, molasses or brown sugar can reduce the likelihood of leftover chemical bleaching chemicals, besides brown sugar also has economic value, another good effect is that EEn is also used as a natural disinfectant [8].

It should be noted during the socialization activities not to use granulated sugar (white sugar) in the making of Eco-enzymes. The waste used is fruit/vegetable waste, which is typically discarded through open dumping (waste is thrown away in a landfill without any treatment), without further management, leading to environmental pollution (disturbance) and unpleasant odors. One potential that can be seen from fruit waste is as an EEn (Energy and Environmental Nutrient) because fruit waste itself contains enzymes that can aid in the breakdown of nutrients in the soil, thereby increasing the availability of nutrients such as Nitrogen (N), Phosphorus (P), Potassium (K), Vitamins, Calcium (Ca), Iron (Fe), Sodium (Na), Magnesium (Mg), and others. Vegetable waste easily rots due to its high water content, which creates an environmental problem that continues to increase daily, making it difficult to find disposal sites. One method that can be employed is using vegetable waste to create a product known as ecoenzyme. Research results indicate that EEn can enhance rice plant production and serve as a disinfectant [9]. EEn derived from papaya and pineapple waste has antibacterial properties against *Enterococcus faecalis* [10].

Conclusion

Eco-enzymes can be one of the solutions to address the issues of organic waste and reduce environmental pollution caused by household organic waste. Eco-enzymes are products that are easy and inexpensive to make, and they are multifunctional; they can be used as antibacterial agents, disinfectants, or to assist bind nutrients for plants, improve soil fertility, and increase crop production.

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