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Utilization of Organic Waste to Produce Eco-Enzymes as a Waste Management Effort in Kresek Village: An Initiative by the Community Service Program (KKN) of the Al-Jihad Shalahuddin Al-Ayyubi Islamic Institute, Jakarta

Zaenal Arifin[1*], Ahmad Saparudin[2], Akhmad Khumaedi[3], Ananda Ayu Fadillah[4], Dinda Astuti[5], Hanisa Midira[6], Heriya Istikomah[7], Iim Khilmiah[8], Isnaini Safira[9], Mauidhotul Khasanah[10], Muhamad Bayu Pratama[11], Wahyudin[12]
Institut Agama Islam Al-Jihad Shalahuddin Al-Ayyubi Jakarta
Corresponding Author: Zaenal Arifin, nufust@gmail.com

A R T I C L E I N F O

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A B S T R A C T

Waste is one of the environmental problems that is still frequently encountered in everyday life. One type of waste that is widely generated is organic waste, such as food scraps, fruit peels, and vegetables. Organic waste can actually still be utilized so that it does not merely end up as waste. One way to utilize organic waste is by processing it into ecoenzyme. Eco-enzyme is a liquid produced through the fermentation of organic materials such as fruit peels or vegetables, sugar, and water. This activity aims to increase understanding of the importance of waste sorting and to introduce the utilization of organic waste into eco-enzyme. The methods used include data collection, data processing, and data presentation. Data were obtained through observation and literature review concerning waste problems, waste sorting, and the utilization of organic waste into ecoenzyme. The results of the discussion show that waste sorting can support waste management, particularly by separating organic and inorganic waste. Separated organic waste can be utilized as a material for producing eco-enzyme. Thus, the utilization of organic waste into eco-enzyme can be a simple effort to reduce waste accumulation while producing a product that can be utilized in everyday life

INTRODUCTION

Latar Belakang

Waste comes from the byproducts of various human activities, including household activities and others. Population growth leads to increased human activity, which can result in even greater amounts of waste being generated. If waste is not managed properly, it will cause various diseases and environmental problems.

The problem is that various types of waste are still mixed together in the community. Organic and inorganic waste have different characteristics and therefore require different management methods. Organic waste, such as food scraps, fruit peels, vegetables, and leaves, can decompose, whereas inorganic waste, such as plastic, bottles, and cans, takes a long time to decompose.

One simple step we can take to help manage waste is to separate organic waste from inorganic waste. By sorting waste at home based on type and potential use, the separated organic waste does not have to be disposed of immediately but can be recycled into something useful.

Organic waste is processed into ecoenzymes, which are liquids produced through the fermentation of organic materials such as fruit and vegetable peels with water and sugar. Turning organic waste into ecoenzymes can be an alternative way to reduce waste buildup.

Given this issue, it is essential to understand the importance of waste sorting and the utilization of organic waste. Therefore, this activity discusses the conversion of organic waste into ecoenzymes as one approach to waste management.

Identification of the Problem

1. How is waste managed in the community?
2. Why is waste sorting important?
3. How can organic waste be turned into eco-enzymes?
4. What are the benefits of eco-enzymes produced from organic waste?

Purpose of the Activity

1. To understand waste issues in the community.
2. To increase understanding of the importance of waste sorting.
3. To learn how to convert organic waste into eco-enzymes.
4. To learn about the benefits of eco-enzymes in everyday life.
5. To encourage the reuse of organic waste to give it practical value.

Benefits of the Activity

This activity is expected to provide knowledge about waste management, particularly the separation of organic and inorganic waste. In addition, this activity can help participants understand that organic waste, such as fruit and vegetable peels, can still be turned into useful products.

THEORETICAL REVIEW

Waste and Its Management

Waste generated from various human activities that is no longer in use can be managed so that it does not harm the environment. Waste can be classified based on its characteristics into organic and inorganic waste. Organic waste, such as food scraps, fruit peels, and vegetable leaves, can be processed through decomposition. Meanwhile, inorganic waste, such as plastic, bottles, and cans, takes longer to decompose.

Waste management must be carried out properly to reduce the amount of waste disposed of. One step in waste management is sorting waste by type. Sorting waste allows materials that still have value to be separated and reused, while non-reusable waste can be managed according to its characteristics. Waste management and recycling are efforts to reduce waste-related problems in the environment (Naibaho et al., 2021).

Waste Sorting

Waste sorting can begin at the source by separating organic and inorganic waste. Sorting is important because separated waste is easier to manage, recycle, or process according to its type.

Separated organic waste is used to make eco-enzymes. Thus, waste sorting is helpful and offers opportunities for added value.

Organic Waste as a Raw Material for Ecoenzymes

Fruit and vegetable peel waste still contains materials that can be reused. One way to utilize it is by processing it into ecoenzymes a liquid produced through the fermentation of organic waste, sugar, and water. The organic waste used in the production of eco-enzymes comes from household waste, such as fruit and vegetable scraps, so its use can help reduce the disposal of organic waste (Galintin et al., 2021).

The conversion of organic waste into eco-enzymes is a form of waste management that can produce useful products. The process of making eco-enzymes can also serve as a means to raise public awareness about the importance of reducing and reusing organic waste (Muarief et al., 2023).

Enzymes and Their Applications

Ecoenzymes are produced through the fermentation of organic waste, sugar, and water in a sealed container over a specific period. This process yields a liquid that can be used for various purposes. Several studies and community service activities have shown that ecoenzymes can be used in household activities as well as in applications related to the environment and plants (Nisawati & Yahya, 2020; Prasetio et al., 2021).

The use of eco-enzymes adds value to organic waste, as waste materials can be processed into ready-to-use products. Processing organic waste into eco-enzymes can serve as a simple alternative and support waste management by raising public awareness about reusing materials that still have practical value.

METHODOLOGY

Data Collection

Data was collected through observations of waste-related issues and by reviewing sources that discuss waste management and the conversion of organic waste into eco-enzymes. The data collected includes information on types of waste, the importance of waste sorting, the definition of eco-enzymes, the materials used in making eco-enzymes, the fermentation process, and the benefits of eco-enzymes.

Data Processing

The collected data was processed and then grouped by topic. Data on waste was used to explain the issues and the importance of waste sorting. Data on ecoenzymes was used to explain the process of utilizing organic waste. Data analysis was conducted descriptively based on observational findings and literature sources.

Data Presentation

The data is presented in the form of an explanation or description. The presentation follows the order of the discussion, starting with the waste problem, waste sorting, the use of organic waste, the eco-enzyme production process, and ending with the benefits of eco-enzymes.

RESEARCH RESULT AND DISCUSSION

The Waste Problem

Waste is an environmental issue that concerns us all. Waste is generated by various human activities and comes in many different forms. To manage it effectively, waste must be sorted by type so it can be handled according to its specific characteristics.

Waste can be categorized as organic and inorganic. Examples of organic waste include dry leaves and vegetables, while examples of inorganic waste include bottles, paper, boxes, and cans.



Figure 1. Photographs of organic and inorganic waste bins at the KKN site.

The Importance of Waste Sorting

Waste sorting by type can be done by separating organic and inorganic waste at the household level.

Waste sorting plays an important role because sorted waste is easier to manage and utilize. Organic waste is processed into compost or other products, while certain types of inorganic waste are recycled or reused.

Turning Organic Waste into Ecoenzymes

Organic waste, such as fruit and vegetable peels, still has the potential to be put to good use. One way to do this is by processing it into eco-enzymes.

The ingredients used include vegetables, fruit peels, sugar, and water. These ingredients are mixed together and then fermented in a container for some time. Making eco-enzymes is one way to recycle organic waste.



Figure 2. Documentation of the organic materials used for eco-enzymes.

The Process of Making Ecoenzymes

The process of making ecoenzymes uses relatively simple ingredients. The ingredients and tools used include:

Ingredients:

1. Molasses/brown sugar
2. Fresh, clean fruit or vegetable scraps,
3. Water

Equipment:
1. Knife,
2. Bowl/bucket/container,
3. Gallon jug (sealed plastic container),
4. Measuring cup,
5. Scale,
6. Strainer.

To make eco-enzymes, there are several recipes you can use, depending on your needs, including: 1 liter of water, 100 grams of molasses/brown sugar, and 300 grams of fruit and vegetable scraps; or 5 liters of water, 500 grams of molasses/brown sugar, and 1.5 kg of fruit and vegetable scraps. A 10-liter batch: 1 kg of molasses or brown sugar and 3 kg of fruit and vegetable scraps. For example: 500 ml of water, 50 grams of brown sugar, and 150 grams of fruit or vegetable peels.

Steps:
1. Prepare clean utensils.
2. Dissolve the molasses or brown sugar according to the specified amount.
3. Wash the leftover fruits and vegetables thoroughly, then cut them into small pieces.
4. Pour the molasses or brown sugar into the container used to store the eco-enzyme, add the chopped leftover fruits and vegetables, and seal the container tightly.
5. Label the container with the date of preparation and harvest, and store it in a cool, shaded place away from direct sunlight.
6. During the fermentation process, open the lid regularly to release gas.
7. After 90 days or 3 months, open the eco-enzyme container, strain it to separate the liquid from the organic matter, and the eco-enzyme liquid is ready for harvest. accumulation and also produces a liquid that can be used for various purposes.



Figure 3. Documentation of the ecoenzyme production process or the final product.

Waste Utilization as a Way to Protect the Environment

Waste management requires community involvement. Simple habits like sorting waste help reduce the accumulation of discarded waste.

Organic waste can be turned into eco-enzymes an example of an activity that transforms waste into something useful.

CONCLUSIONS AND RECOMMENDATIONS

Waste is an environmental problem that needs to be managed properly. Waste sorting allows waste to be separated based on type and management method. Organic waste, such as fruit and vegetable peels, can still be utilized and does not have to be discarded immediately.

One way to utilize organic waste is through eco-enzymes. Eco-enzymes are produced through the fermentation of organic waste, sugar, and water. The production process uses waste materials and relatively simple equipment. Eco-enzymes also have various benefits, particularly in household activities and for plant care.

Thus, processing organic waste into eco-enzymes can be a simple way to reduce waste while raising public awareness about the importance of environmental management.

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