

## Utilization Of Organic Waste To Become Eco-Enzyme In Developing Community Environmental Literacy

Yunus Abidin, Hana Yunansah, Dede Margo Irianto, Yusuf Tri Herlambang, Rahman Wahid

Universitas Pendidikan Indonesia Kampus Cibiru  
yunusabidin@upi.edu

### Abstract

Community service Program aims to develop the literacy environment of the community through the activities of the utilization of organic waste into eco-enzyme. Eco-enzyme to be one of the effective solutions in addressing the buildup of organic waste in the community and manage it into something more useful. Products that can be generated from the management of organic waste into eco-enzyme among others, is a liquid soap, toilet cleaner, air freshener, and water purification. In addition, the community service program is driven over the still low literacy communities is shown by the less skilled of the community in managing organic waste. The method used in the program of the community service is done using the method of the development of action research. The results of community service activities conducted in the Village of Pasir Biru, Cibiru District, Bandung City go according to plan and obtain the level of satisfaction of the partner.

**Keywords:** Eco-Enzyme, The Environment, Organic Waste

### INTRODUCTION

The increase in human population has resulted in an increase in the amount of waste production increasing from year to year. The increasing amount of waste has a large impact on environmental damage and also has an impact on the health of other living things (Dewi, 2021). Meanwhile, waste is residual material that is waste from the production process, whether it is carried out within the household or industrial scope. Several types of waste which are leftovers from these production activities can be produced by humans, animals, or by plants that can no longer be used. In addition, the category of the form of the waste itself can be in the form of solid, liquid, and gas. In this regard, the World Health Organization (WHO) defines waste as leftover goods produced by human activities. In addition, waste can also come from activities that are natural or without human intervention (Yanti & Awalina, 2021; Harahap. Etc., 2021).

In line with this, waste can be divided into several types, namely: (1) waste based on its source; (2) waste based on its nature; and (3) waste based on its shape. The waste based on its nature is divided into two types, namely inorganic waste and organic waste. Inorganic waste can be defined as waste that takes a long time to decompose and is difficult to decompose. However, inorganic waste can still be recycled quite easily into useful items. Examples of inorganic waste include plastic, paper, cans, and iron. Inorganic waste that is not recycled and allowed to accumulate becomes an environmental problem because inorganic waste is more difficult to decompose by nature (Suardana, 2021; Rambe, 2021; Septiani, Najmi & Oktavia, 2021).

Meanwhile, organic waste is waste that decomposes more easily so that it can be easily decomposed by nature. Organic waste is widely used by humans as compost that comes from food scraps, dry leaves, and unused vegetables. Composting is the most commonly used method for managing organic waste because it is considered effective and efficient. The results of composting have great benefits for humans and nature, such as to fertilize the soil (Junaidi. et al, 2021).

In this regard, one of the new alternatives that can be done in managing organic waste is through the eco-enzyme method. Eco-enzyme is an organic waste management method that was popularized by Dr. Rosukon Poompanvong from Thailand and also the chairman of the Association of Organic Agriculture in Thailand (Agustina & Pratiwi, 2021). His research on eco-enzymes has been

through a long study for almost 30 years. The idea of eco-enzyme stems from the idea of managing organic waste that is often not utilized into natural cleaners. In addition, eco-enzymes are the result of the fermentation process of organic waste such as fruit residue, vegetable residue, sugar, and water (Lestariana, 2021).

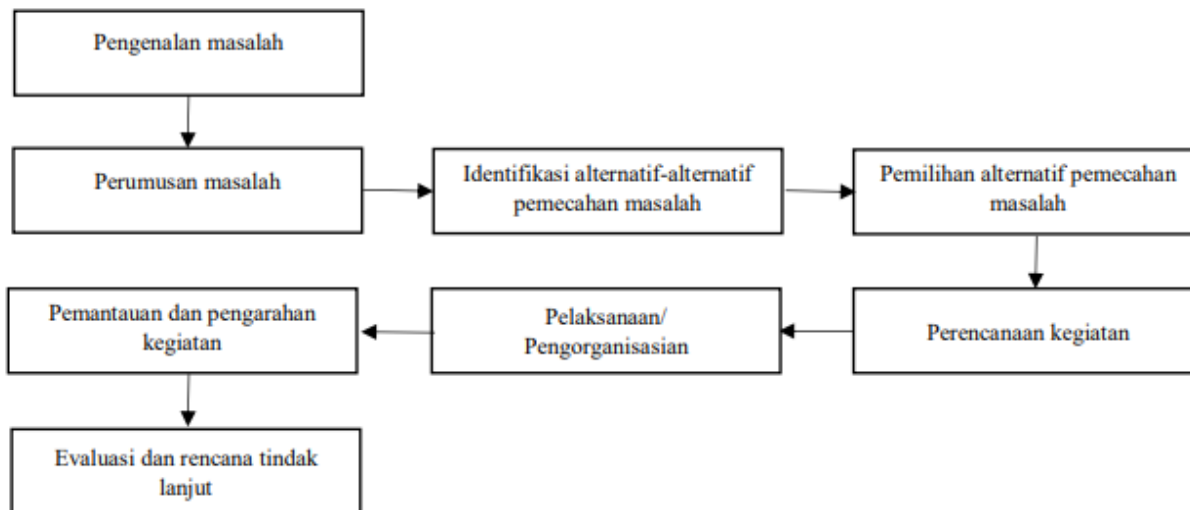
The most prominent advantage of eco-enzymes is that the manufacturing process is easy and does not require large costs. The process of making eco-enzymes only uses organic waste that is easily found, water, and sugar or molasses as a carbon source. In addition, the eco-enzyme method can also minimize the accumulation of organic waste in the environment generated by both household and industrial production. The process of making eco-enzymes requires a plastic container. It is not recommended to use glass for eco-enzyme storage because it is feared that it will break due to the fermentation process. In addition, the reservoirs needed for the manufacture of eco-enzymes are very flexible, meaning that both large and small containers can be used in the process of making eco-enzymes (Fitria & Wahyuni, 2021; Janarthanan, Mani & Raja, 2020).

The recommended waste in the manufacture of eco-enzyme is raw organic waste. The composition in making eco-enzyme is 1 part sugar, 3 parts organic waste, and 10 parts water. Types of sugar that can be used in the process of making eco-enzymes are brown sugar, coconut sugar, or molasses. While the types of water that can be used in the manufacture of eco-enzymes include tap water, well water, air conditioning waste water, and mineral water. The fermentation process needed to make eco-enzyme takes 3 months. In the first month, it will produce alcohol, while in the second month it will produce vinegar, and in the third month it will produce enzymes. In the third month, the eco-enzyme can be harvested by filtering. The filtering process can be done using a cloth or filter.

The eco-enzyme that has been produced can be used into many things such as shampoo, liquid soap, air freshener, toilet cleaner, and water purifier. In addition, by managing organic waste into eco-enzymes, the community has gradually taken steps to prevent waste accumulation and help maintain environmental sustainability. Therefore, based on the explanation that has been explained, the researchers conducted a community service program with the theme "Utilizing Organic Waste to Become Eco-Enzyme in Developing Community Environmental Literacy" as an effort to preserve nature by developing environmental literacy to the community (Larasati, Astuti & Maharani, 2020).

## **METHOD**

The development of creative economy businesses for the residents of Pasir Biru Village, Cibiru District, Bandung City will use the Action Study Development Method through Collaborative and Cooperative Programs with partner institutions for community service activities. The Action Study Development Method is an effort to develop a program of activities that is carried out systematically and comprehensively, starting from an in-depth study of the potential, supporting, and inhibiting factors of the program followed by concrete actions in implementing the program. The ultimate goal of this method is the implementation of the program effectively and efficiently. In an effort to realize community service activities through the use of organic waste into eco-enzymes in developing community environmental literacy, this community service program is carried out through several stages and systematic steps as follows. Preparation phase. At the preparatory stage, the abdimas team conducted a preliminary survey to analyze the location of partners, the training needs needed by partners, and drafted activities to be carried out, as well as developed instruments.



**Figure 1.** Flow of Community Service Activities

In connection with the activity flow scheme above, it can be explained as follows.

1. Identification of problems/needs and potentials as well as awareness.

At this early stage, information was extracted through reflective analysis about the existence of the environment and society in Pasir Biru Village, Cibiru District, Bandung City. This is done as a basis for determining the orientation of the training activities to be carried out.

2. Problem formulation and priority setting.

The problem formulation stage is the stage of determining the focus of the goal of community service training activities that will be carried out, especially on essential community problems related to efforts to increase community environmental literacy.

3. Identification of alternative problem solving/ideas development.

The identification stage of alternative problem solving is a stage of dialogue/deliberation with all elements of society, especially the government in Pasir Biru Village, Cibiru District, Bandung City regarding the community's need to develop environmental literacy through organic waste management activities.

4. Selection of the most appropriate alternative problem solving.

At the stage of selecting alternative solutions to problems, determining community service activities according to the needs of the people of Pasir Biru Village, Cibiru District, Bandung City, namely training on organic waste management through the eco-enzyme method which is carried out programmatically and systematically.

5. Activity planning

The activity planning stage is the consensus stage of the service team with the government of Pasir Biru Village, Cibiru District, Bandung City in determining the orientation of activities, including: activity plans, implementation time, form of activities, to monitoring and evaluating activities to be carried out.

6. Implementation/Organization.

No matter how sophisticated a plan is, it will only be meaningful if it is actually implemented. The organization can be concrete and simple or it can be sophisticated and basic to lead to institutional development. The implementation stage is the implementation stage of training activities for making eco-enzymes, which is carried out by starting the process of delivering theoretical/conceptual material which is then ended with practice by the people of Pasir Biru Village, Cibiru District, Bandung City as participants in training activities.

7. Monitoring and direction of activities.

The monitoring and direction stage is the activity stage in controlling the process of implementing organic waste management training activities through the manufacture of eco-enzymes that are carried out. This stage aims to ensure that activities do not deviate from the goals that have been set.

#### 8. Evaluation and follow-up plan.

The evaluation and follow-up stages are the final stages carried out to determine and measure the success of the activities that have been carried out.

### RESULTS AND DISCUSSION

This community service program has been implemented in Pasir Biru Village, Cibiru District, Bandung City. The realization of this activity is carried out through schemes as, among others, (1) problem recognition; (2) problem formulation; (3) identification of problem solving alternatives; (4) alternative selection; (5) activity planning; (6) Implementation (7) monitoring, and; (8) Evaluation and follow-up plan. The first stage is the introduction of the problem, this is done by observing the location of the destination for community service. Then, the second stage is to formulate the problem, this is done by looking at the problems faced by the community service partners, namely the community in Pasir Biru Village, Cibiru District, Bandung City. The third stage, the team identified problem solving, this was done to find solutions faced by community service partners. Then in the fourth stage, the selection of alternative solutions that will be used by the service team for partners is carried out.

Before starting the implementation, the fifth stage is carried out, namely activity planning. This is done to make schemes and techniques during the implementation of community service activities which include preparation for the manufacture of eco-enzymes. The next stage is the implementation stage, this includes making eco-enzymes, starting from purchasing materials and tools, making eco-enzyme containers, selecting storage places, and reaching the final stage of making eco-enzymes.



**Figure 2.** Eco-enzyme production activities

The seventh stage is monitoring, this is done to see how the community can take advantage of the materials and practices that have been provided by the community service team. The last stage is evaluating, this is done in order to reflect on the implementation of community service programs that have been carried out. In addition, this is also intended as input for the community service team so that in the next program activities can be carried out even better.



**Figure 3.** Activities for presenting material on hydroponics

Based on the description above, it can be seen that training on making eco-enzymes for the community can be a strategic step in developing community environmental literacy. This is in line with the opinion of Septiani, Najmi & Oktavia (2021) who said that the manufacture of eco-enzymes that utilize organic waste can provide great benefits for the community, besides being able to be transformed into useful goods and selling value, eco-enzymes are also materials that environmentally friendly (Ginting & Mirwandhono, 2021; Patel, Solanki & Mankad, 2021).

In addition, by using hydroponics, people can get many benefits, apart from being effective and efficient eco-enzymes can also increase production productivity and at the same time maintain environmental sustainability. Therefore, this community service program received a great enthusiastic response from the community. Furthermore, Wen, Lin & Teo (2020) revealed several advantages of eco-enzymes, as for these, they are as follows.

1. Save budget;
2. Can reduce pollution in the environment;
3. Environmentally friendly, because the manufacture of eco-enzymes uses natural ingredients;
4. Can be used as a versatile item; and
5. The manufacturing process is easy, so that even ordinary people can do it.

Basically, making eco-enzymes has great benefits for the development of community environmental literacy, especially in Pasir Biru Village, Cibiru District, Bandung City. In addition, this eco-enzyme training activity went well according to the results of the feedback questionnaire on the satisfaction level of partners in the implementation of community service which said that partners responded positively (93%) with this service activity.

## CONCLUSION

The community service activity program with the theme "Utilizing Organic Waste to Become Eco-Enzyme in Developing Community Environmental Literacy" has been carried out well and is beneficial for the community as indicated by the results of the feedback questionnaire on the level of partner satisfaction in the implementation of community service. In this case the partners gave a positive response (93%) with this service activity. This activity can increase the knowledge and skills of the community in Pasir Biru Village, Cibiru District, Bandung City in developing environmental literacy through the manufacture of eco-enzymes.

## REFERENCES

- Agustina, A., & Pratiwi, K. T. (2021). Pengolahan Limbah Akomodasi Menjadi Eco Enzyme pada Pelaku Wisata di Desa Sidemen Bali. *Indonesian Journal Of Community Service*, 1(2), 460-467.



- Dewi, D. M. (2021). Pelatihan Pembuatan Eco Enzyme Bersama Komunitas Eco Enzyme Lambung Mangkurat Kalimantan Selatan. *Jurnal Pengabdian ILUNG (Inovasi Lahan Basah Unggul)*, 1(1), 67-76.
- Fitria, A., & Wahyuni, D. U. (2021). Pemberdayaan Ekonomi Anggota Pembinaan Kesejahteraan Keluarga (PKK) Di Masa Pandemi Melalui Digital Marketing Atas Produk Eco Enzyme. *ABDIMAS NUSANTARA: Jurnal Pengabdian Kepada Masyarakat*, 3(1), 92-100.
- Ginting, N., & Mirwandhono, R. E. (2021, November). Productivity of Turi (*Sesbania grandiflora*) as a multi purposes plant by eco enzyme application. In *IOP Conference Series: Earth and Environmental Science* (Vol. 912, No. 1, p. 012023). IOP Publishing.
- Harahap, R. G., Nurmawati, N., Dianiswara, A., & Putri, D. L. (2021). Pelatihan Pembuatan Eco-Enzyme sebagai Alternatif Desinfektan Alami di Masa Pandemi Covid-19 bagi Warga Km. 15 Kelurahan Karang Joang. *SINAR SANG SURYA: Jurnal Pusat Pengabdian Kepada Masyarakat*, 5(1), 67-73.
- Janarthanan, M., Mani, K., & Raja, S. R. S. (2020, November). Purification of Contaminated Water Using Eco Enzyme. In *IOP Conference Series: Materials Science and Engineering* (Vol. 955, No. 1, p. 012098). IOP Publishing.
- Junaidi, R. J., Zaini, M., Ramadhan, R., Hasan, M., Ranti, B. Y. Z. B., Firmansyah, M. W., ... & Hardiansyah, F. (2021). Pembuatan Eco-Enzyme sebagai Solusi Pengolahan Limbah Rumah Tangga. *Jurnal Pembelajaran Pemberdayaan Masyarakat (JP2M)*, 2(2), 118-123.
- Larasati, D., Astuti, A. P., & Maharani, E. T. W. (2020). Uji organoleptik produk eco-enzyme dari limbah kulit buah (studi kasus di Kota Semarang). *EDUSAINTEK*, 4.
- Lestarina, N. N. W. (2021). Pelatihan Pembuatan Eco-Enzyme Dari Sampah Organik Bagi Ibu Di Wilayah Rw3 Kebraon Surabaya. *Jurnal Ilmiah Tatengkorang*, 5(2), 60-64.
- Patel, B. S., Solanki, B. R., & Mankad, A. U. (2021). Effect of eco-enzymes prepared from selected organic waste on domestic waste water treatment. *World Journal of Advanced Research and Reviews*, 10(1), 323-333.
- Rambe, T. R. (2021). Sosialisasi dan Aktualisasi Eco-Enzyme sebagai Alternatif Pengolahan Sampah Organik Berbasis Masyarakat di Lingkungan Perumahan Cluster Pondok II. *Jurnal Pengabdian kepada Masyarakat*, 2(1), 36-40.
- Septiani, U., Najmi, N., & Oktavia, R. (2021, October). Eco Enzyme: Pengolahan Sampah Rumah Tangga Menjadi Produk Serbaguna di Yayasan Khazanah Kebajikan. In *Prosiding Seminar Nasional Pengabdian Masyarakat LPPM UMJ* (Vol. 1, No. 1).
- Suardana, A. A. K., & Rahayu, N. P. N. A. (2021). Pengenalan: Pengolahan Sampah Organik Berbasis "Eco-Enzyme" Di Desa Batannyuh, Marga, Tabanan. *Jurnal Sewaka Bhakti*, 7(2), 81-87.
- Wen, L. C., Ling, R. L. Z., & Teo, S. S. (2021). Effective Microorganisms in Producing Eco-Enzyme from Food Waste for Wastewater Treatment. *Applied Microbiology: Theory & Technology*, 28-36.
- Yanti, D., & Awalina, R. (2021). Sosialisasi dan Pelatihan Pengolahan Sampah Organik Menjadi Eco-Enzyme. *Jurnal Warta Pengabdian Andalas*, 28(2), 84-90.