

## **Training on Making Eco Enzymes from Fruit Waste in Suka Damai Village, Kuala Sub-District, Langkat District**

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**Abstract.** *Ekoenzyme or Eco enzyme (EE) is the result of fermentation from organic waste in the form of vegetables or fruits, Ecoenzyme products are environmentally friendly products, easy to use, and easy to manufacture, and multi-functional, can be used to increase plant nutrients, so that the soil becomes more fertile, to clean the surrounding environment (environmental sanitation), to clean. mop the floor, clean yourself (bathing, brushing teeth, and others) and to provide air, all of which boils down to helping save our earth. Household organic waste is generated by many people every day. Therefore, one of the efforts for waste management is needed to increase the knowledge of the community in the village of Suka Damai, namely additional information and knowledge and awareness of the community group will make EE as one of the multi-functional products, which can overcome the problem of a lot of waste or organic waste, especially in households, The effort is to overcome and protect the environment, which has a good positive effect that can also be used to fertilize the soil. . The method of this activity was carried out using lecture and discussion methods, as well as hands-on practice. The results of this EE making training can help the community in managing organic waste, both fruit and vegetable waste.*

**Keywords:** *Ecoenzymes, Organic Waste, Training*

### **INTRODUCTION**

Waste is a serious problem, especially for areas or villages that do not have landfills. If waste is only disposed of, it certainly requires a special waste disposal site, and can cause environmental pollution around us. This is no exception occurs in the population and population groups in the region / village Suka Damai, Kuala district, Langkat Regency, North Sumatra province. One of the efforts that can overcome household waste is by making Ekoenzyme (EE) (Susilowati, Ma'Shum, and Arifin 2021). Ekoenzim or Eco enzyme, which we hereinafter refer to as EE, is the result of fermentation of organic material waste in the form of vegetables or fruits, Ecoenzyme products are

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environmentally friendly products, easy to use, and easy to manufacture, and multi-functional, can be used to increase plant nutrients, so that the soil becomes more fertile, to clean the surrounding environment (environmental sanitation), to clean. mop the floor, clean yourself (bathing, brushing teeth, and others) and to provide air, which all boils down to helping save our earth.

Suka Damai Village is one of the villages where the Thematic Real Work Lecture (KKNT) of Universitas Pembangunan Panca Budi is held. This village has an area of 450 ha, and is one of the villages in Kuala District, Langkat Regency, North Sumatra Province, Indonesia. Klambir V Kebun Village has 4 (Four) hamlets, namely:

1. Dusun I Indah jaya with an area of 48.50 Ha,
2. Dusun II Mekar Jaya with an area of 72.50 Ha,
3. Dusun III Sekar Wangi with an area of 196 Ha and
4. Dusun IV Sumber Rejo with an area of 133 hectares.

The majority of the population of suka damai village adheres to Islam and the majority of the occupations of the people of suka damai are plantations and raising livestock, apart from that, the village of suka damai also has a business sector or MSMEs. The lack of knowledge of the residents in the utilization of waste causes the agricultural waste to be discarded, or only used as organic fertilizer, If the waste is only discarded, it certainly requires a special waste disposal site, and can cause environmental pollution around us(Viza 2022).

Therefore, it is necessary to increase the understanding of the community in Suka Damai village, namely additional information and knowledge in order to further increase the knowledge and awareness of the community group about making EE as a multi-functional product, which can save organic waste or waste, so that it is more effective. The effort is to overcome and protect the environment, which has a good positive effect that can also be used to fertilize the soil. One of the efforts that can be done to increase the knowledge of the community group is to carry out agricultural counseling on training in making ecoenzymes from household organic waste.

The solution offered to the partner's problem is in the form of training in making ecoenzymes and their applications, where EE will be taught in the form of hands-on

training using organic waste materials provided by residents (Zainal, Aji, and Pratiwi 2023). Also about the use and utilization of EE for plants, environmental hygiene, for cleaning households, and as a killer of microorganisms (disinfectant), and environmental sanitation (Astuti and Maharani 2020).

KKNT is carried out in Suka Damai Village which is one of the villages in Kuala District, Langkat Regency. Suka Damai Village has an area of  $\pm 450$  Ha with a population of 1,305 people. The entire population of the village of Suka Damai adheres to Islam and the majority of the jobs of the people of Suka Peace are plantations and raising livestock, apart from that Suka Peace village also has a business sector or MSMEs.

In marketing, the people of suka damai village still do it manually or there is still no good use of technology. Seeing from these conditions, we KKNT students who have participated in conducting field surveys propose a new innovation by socializing the use of information technology and providing innovations to improve the community's economy through MSMEs.

## **LITERATURE REVIEW**

### **Fruit Waste Management**

Fruit waste management is becoming increasingly important given the increase in fruit production and the resulting environmental impact. The study by [Researcher A] (Year) highlighted the need to identify sustainable solutions for managing fruit waste, including the utilization of waste as raw materials for value-added products (Rohyani et al. 2022).

### **Eco-Enzymes as an Environmentally Friendly Product**

Eco-enzymes, which are produced through the fermentation process of organic waste, have been the focus of research as an eco-friendly alternative for waste management. eco-enzymes have various benefits, including as organic fertilizers, natural pesticides, and eco-friendly cleaners (Eskundari, Purwanto, and Rosyid 2022).

### **Community Role in Waste Management**

Active community participation in waste management is key to creating sustainable solutions. According to (Maulana and Khumaeroh 2021), community involvement in the manufacturing process of environmentally friendly products such as eco-enzymes can increase environmental awareness and responsibility (Fitri et al. 2023).

### **The Importance of Training and Education**

Training and education play a key role in changing community behavior regarding waste management. Research by (Yulistia and Chimayati 2021) shows that training can improve community knowledge and skills in managing waste, shaping a more sustainable attitude.

### **Economic Potential of Eco-Friendly Products**

The development of environmentally friendly products, such as eco-enzymes, can also have a significant economic impact. According to (Sofiana et al. 2023), the creation of local business opportunities from these products can improve the economic well-being of communities.

### **Similar Case Studies**

The literature review also included similar case studies of training in eco-enzyme production from fruit waste in other geographical locations. (Nurliah, Elika, and Sagena 2022) showed that this approach has been successfully implemented in various regions, providing positive results on environmental, economic and social aspects (Sari and Haris 2023).

## **RESEARCH METHOD(S)**

### **Approach Method Offered**

The environment of the village of suka damai can be categorized as litter-free, as residents of suka damai are very fond of planting plants such as flowers, trees or lemongrass leaves in front of their yards, thus making the environment of the village of suka damai look beautiful.

The absence of cleaners who clean or transport garbage makes the villagers enthusiastic about burning or planting garbage or household waste in their backyard.

The community is also compact and lives in harmony, the community always participates in activities held in each hamlet such as posyandu activities, perwiritan, rewang and other social activities.

### **Work Procedure**

1. Lecture and discussion on EE training

The lecture material was provided to participants in the form of an EE training module, followed by discussion (Q&A) and field practice.

2. Hands-on practice of making EE from organic waste.

### **Place and Time**

This activity was carried out on Thursday, July 27, 2023 in Suka Damai village, Kuala sub-district.

### **Description of Partner Participation**

In this EE-making training, the community of Suka Damai village participated in providing materials for making EE in the form of well water/gallons/rainwater, and household waste.

### **Program Implementation Evaluation Description**

1. After knowing how to make EE, it is hoped that it can increase public awareness in utilizing organic waste to be more useful so as to reduce the accumulation of garbage or waste and reduce environmental pollution, especially air pollution in the presence of unpleasant odors from waste.
2. EE that has been made (fermented) for 100 days can be harvested and used for daily purposes. For the evaluation, the implementation team will conduct monitoring and evaluation.

## **FINDINGS AND DUSCUSSION**

## Local Resources/Local Wisdom



**Figure 1. Research Location**

Suka damai village is one of the villages located in Langkat district kuala sub-district. Langkat Regency consists of 23 sub-districts, Geographically, the village of suka damai is located at LU: 3.4666 and BT: 98.4000, while topographically the village of suka damai is included in the category of highland areas, with an altitude of  $\pm 125$  meters above sea level (above sea level).

The area of suka damai village is 450 hectares, which consists of 150 hectares of dry land, 289 hectares of plantation land and 11 hectares of public facilities. The village borders Blangkahan village to the north, Parit Bindu village to the east, Parit Bindu village to the south, and Beruan village and Blangkahan village to the west.

Related to government administration, the area of suka damai village is divided into four, namely hamlet I Indah Jaya with an area of 48.50 hectares, hamlet II Mekar Jaya with an area of 72.50 hectares, hamlet III Sekar Wangi with an area of 196 hectares and hamlet IV Sumber Rejo with an area of 133 hectares.

Desa suka damai has local wisdom, namely the art of Kuda Lumping, which is given the name Sanggar Tunas Muda. This studio has been established for 5 years, to be precise, since 2018. This studio makes all the equipment and attributes of the activity itself, has 7 dancer members, 5 music player members and 3 backup players where the

average member is a young person or teenager. The children of the studio are not only trained to play kuda lumping but also to play traditional musical instruments.

### **Village Facilities and Infrastructure**

Suka Damai Village has several facilities and infrastructure, namely each dusun has a mosque and mushollah, schools (Lau Buntu Elementary School and Early Childhood Kindergarten), Posyandu and a weekly market, apart from that Suka Damai Village also has electricity, clean water sources and telecommunication networks. The existing facilities and infrastructure are in good condition, suitable for use, clean and well-maintained so that they are very helpful and useful for the surrounding community.

### **Aspects of Village Potential**

The potential of suka damai village is in the fields of tourism and arts. Desa suka damai has a place that is very suitable to be used as a potential in the tourism sector. There are many different and clear streams with natural charm that can be used as bathing or picnic attractions. With this natural charm, it is hoped that it can increase the enthusiasm of the community to preserve and protect nature in order to avoid environmental pollution.

Another potential in suka damai village is MSMEs. Desa suka damai has several MSMEs such as small stalls, tofu factories, tempeh chips, palm sugar and several farms such as chickens and fisheries. These MSMEs are included in the village potential of the village of peace because they are able to advance the economy of the surrounding community.

### **Village Development Priorities**

Desa suka damai is currently focusing on infrastructure and health development. In the infrastructure sector, the village focuses on road construction, village drainage channels (ditches) In the health sector, the village focuses on public health and improving environmental safety and cleanliness.

### **Regional Situation**

The environment of the village of suka damai can be categorized as litter-free, as residents of suka damai are very fond of planting plants such as flowers, trees or

lemongrass leaves in front of their yards, thus making the environment of the village of suka damai look beautiful.

The absence of cleaners who clean or transport garbage makes the villagers enthusiastic about burning or planting garbage or household waste in their backyard.

The community is also compact and lives in harmony, the community always participates in activities held in each hamlet such as posyandu activities, perwiritan, rewang and other social activities.

Training on making eco-enzymes from fruit waste in Suka Damai Village, Kualakabupaten Langkat District produced a significant positive impact. The training participants, especially the local community, experienced an increase in knowledge and practical skills in the process of making eco-enzymes. The training not only provided practical benefits in managing fruit waste, but also changed the community's view of waste as a resource that can be utilized.

In the training discussions, participants showed a better understanding of the concept of sustainable waste management. They were able to understand the benefits of converting fruit waste into eco-enzymes, which are not only environmentally friendly but can also increase agricultural productivity. Local communities now have the skills to properly select and process fruit waste, resulting in quality eco-enzyme products.

More broadly, this training has had a positive impact on the environment and local agriculture. Fruit wastes that were previously considered as garbage are now being utilized in a useful way. The eco-enzyme produced from this waste can be used as organic fertilizer, improving soil quality and contributing to sustainable agriculture in Suka Damai Village.

In addition to the environmental and agricultural aspects, the training also created self-reliance at the household level. The local community can now produce their own eco-enzyme, turning waste into a valuable resource. Thus, the training not only provides practical benefits but also empowers local communities to take an active role in their own environmental management.

The training also opens up the potential for local economic development. The eco-enzymes produced have the potential to be sold or distributed, creating small business



opportunities at the local level. This can open the door to sustainable economic development and provide long-term benefits for the people of Suka Damai Village.

To maintain the sustainability of the program, there needs to be follow-up, such as monitoring and evaluation activities. Continuous monitoring will help ensure that the eco-enzyme production is efficient and has a sustainable impact. In addition, it is also important to identify further opportunities, such as further training or new product development, to continue to increase the benefits that this program can provide to the local community and environment.

## **CONCLUSION AND RECOMMENDATION**

Thus, the training on making eco-enzymes from fruit waste in Suka Damai Village, Kualakabupaten Langkat, has brought a wide positive impact. Through increased knowledge and practical skills, the local community now has the ability to manage fruit waste into useful eco-enzymes. This process not only creates eco-friendly products, but also increases environmental awareness and sustainable agriculture.

This training opens up new opportunities by empowering communities to actively engage in their environmental conservation efforts. Fruit waste, previously considered a problem, is now a valuable resource. The resulting eco-enzymes provide tangible benefits to soil health and agriculture in Suka Damai Village, providing a positive impact that can be felt in the long run.

In addition to the environmental and agricultural impacts, the training also contributed to the self-reliance of the local community. By having skills in eco-enzyme manufacturing, the community can manage waste independently and produce products that they can utilize. This creates an environment where communities become more empowered and more responsible for their waste management.

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