

## ECO ENZYME AS A MEANS OF ENVIRONMENTAL CLEANLINESS AND HOUSEHOLD WELFARE

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### ABSTRACT

Cibuntu Village is a village in Bekasi Regency where most of the population comes from outside the area because employees are in the MM2100 industrial area and live in housing estates or in boarding houses or guesthouses provided by the company, while the original residents have lived outside housing and since its establishment. The MM2100 industrial area becomes food traders (warung), vegetable traders, waste collectors, workers in the MM2100 Industrial area and various other odd jobs, the MM2100 Industrial Estate accepts approximately 5000 employees per year, which means the population increases sharply every year, as well as with garbage, because the source of the waste is the house. Housewives who on average don't work want to be empowered to manage their household waste, but they don't want it if there is no economic benefit, so the approach taken in community service is an approach to environmental hygiene and welfare. The objectives of this community service are: (1) to provide education and motivation to process waste; (2) the practice of processing household waste; (3) assistance for program sustainability and (4) program sustainability. The results achieved from this community service are: (1) the achievement of increased knowledge (2) there is a waste processing site; (3) the formation of a waste management group; (4) the presence of at least one bottle of eco enzyme every 3 months in the homes of program participants.

**Keywords:** Waste management, education, motivation, welfare, eco enzyme

### 1. INTRODUCTION

Cibuntu is a village located in Cibitung District, Bekasi Regency, West Java Province, in which an industrial area called MM210 operates which has been operating since 2000. Cibuntu Village annually receives 1600 new residents from all over Indonesia. And that number is increasing from year to year until now. This increasing population of course also produces household waste which is usually in the form of dry waste (such as plastic, paper and cardboard) and wet waste (vegetables, fruit and food scraps). The existence of garbage around people's residences has more or less integrated into every line of life of the surrounding community so that it significantly affects people's lives. The most common ones found there include: garbage in drains / ditches and even covers the flow of rivers, so that if it rains heavily, it will flood.

The indigenous people of Cibuntu are people who are mostly in the lower middle economic class. Before the establishment of the MM2100 Industrial Estate, they relied on the agricultural sector for their livelihood. This makes them also have a low level of concern for the importance of education so that it is difficult to rise from poverty. Most of the parents in Cibuntu Village employ their children as garbage/waste collectors and earn money by working odd jobs to help support their family's living expenses after they return home from school. Even if there are those who work as employees in the MM2100 Industrial Estate, it is limited to the security, cleaning or kitchen sections, and usually even then with a contract system. Uncertain income from scavenging livelihoods and lack of skills and education reduce job opportunities and improve the family economy.

These women who drive the PKK in Cibuntu Village were initiated by housewives whose husbands work at the Cibuntu Village Office. His initial birth was motivated by the village head's concern for the future of the indigenous people who remain in the cycle of poverty with low economic and educational levels with a livelihood as scavengers or garbage collectors and odd jobs. These mothers believe that if housewives join and want to run the program, their families especially children will have a better future than today. The women who drive the PKK are focused on empowering housewives, who rather than staying at home or chatting, it is better to gather together to make joint activities that can serve as an example to the children and other household members. These women who drive the PKK provide education, training, assistance with facilities and infrastructure for the implementation of eco enzyme gardens. The program is carried out at the village office free of charge and is expected to change the mindset of housewives to continue to support cleanliness so that they are free from waste and poverty.

In addition, these housewives will also open advanced processing training for eco-enzyme products specifically for mothers who want to improve household welfare. This program is an asset for women because it has begun to penetrate into the productive economy. These women also open volunteers from any local community to be organic waste pickers from people's homes, this is to introduce the positive side of waste. These women also provide a place to produce souvenirs in the form of ecoenzyme in used bottles from housing to take home and use as liquid soap, hand

sanitizer, liquid fertilizer, and others. Based on preliminary data, it shows that there are around 3000 families living in Cibuntu Village, imagine the waste that is produced every day, no matter how you want to manage it, it will generally not get proper management. So that garbage pollution occurs around housing, not only affecting cleanliness but also the mental condition of the community. Many of the residents don't care when they see trash scattered around because they feel it's not their job to clean it up. Only later when it rains and floods, water enters his house, realizing that it is necessary to realize cleanliness and manage waste properly. In the future, all parents, namely the heads of families, children and adolescents, must be encouraged to participate in this environmental hygiene education program so that they can jointly support the improvement of the living standards of the families of the surrounding community by making eco-enzymes. The condition of waste in people's homes must be used as a livelihood, although it is very minimal, but it is very clean for the environment. If eco enzyme has been produced, it can be used to minimize the pungent smell of garbage. On the other hand, all members of the community can use eco-enzyme for household needs such as soap for washing dishes, clothes, and mopping floors without having to buy it at a nearby shop which will generate more waste. By managing waste properly, the surrounding community is no longer vulnerable to diseases that arise due to waste

Based on the description above regarding the problems that arise, several main problems for the Cibuntu Village community are formulated, including:

- a. As a native community, you are resigned to the situation, feel satisfied and enough with what you have
- b. Low motivation to improve the standard of living
- c. The narrow mindset of the surrounding community to get out of the poverty circle with a pragmatic perspective has resulted in economic conditions that continue to decline. Generally, local residents survive by making a living as a hereditary garbage scavenger and the education of children is not important.
- d. Lack of knowledge about waste management
- e. The low level of education and knowledge of the housewives in the village of Cibuntu makes waste just thrown away which has an impact on the accumulation of garbage and scattered everywhere.
- f. Lack of training
- g. The environmental conditions of local residents lack training because the community did not respond to an activity that did not generate money.

## 2. METHOD

### Stages:

This PKM activity targets 30 housewives in Cibuntu village as PKM participants who will take part in PKM activities in 3 stages, including:

#### First Stage (Preparation)

At this stage it is divided into 2 activities, namely:

- a. Coordination with the implementation team consisting of a lecturer and 2 support staff. Preparation of mentoring materials and supporting equipment.

After the community service proposal was approved by the Sahid University Jakarta Research and Community Service Institute (LPPM), the implementing team consisting of Dr. Marningot Tua Natalis Situmorang, Ir. Yulia Septianingsih and Susana Harisetiadi, ST immediately prepared materials on eco-enzymes and shopping for tools and materials to be used during the training.

- b. Coordination with PKK movers and the surrounding community regarding the day and time and place of implementation

After all the training materials and tools that will be used during the training have been prepared, the implementation team contacted the head of the Cibuntu Village PKK, in this case the wife of the Cibuntu Lurah, to confirm the day and date of the training, training time, and place of training.

#### Second Stage (Implementation of Activities and Training)

The stages of implementing this activity and training are as follows:

- a. Pretest. This pretest is to determine the initial knowledge of PKM participants. The test tool used is a questionnaire with questions that have a choice of answers. This activity is carried out for 30 minutes. The results of this pretest were used to map participants' knowledge about waste, waste management and environmental hygiene.

From the results of this pretest, it was found that all participants knew what waste was and the types of waste, but so far they had only collected it in a box or trash can and at the appointed time it was taken out of the house to be picked up by the janitor who was funded by village funds.

As for waste management, such as making eco-enzymes, they don't know how, but they have heard of the term eco-enzyme through television and social media.

b. Socialization of eco enzymes.

The lecture was delivered by Dr. Marningot Tua Natalis Situmorang, with a duration of 30 minutes then followed by a question and answer session between the speaker and the training participants.

c. Training on making eco enzymes by utilizing leftover fruits and vegetables.

Before to the implementation of the training, all training participants were informed to bring organic waste in the form of vegetables and fruits waste. The rest of the vegetables and the rest of the fruits during training will be washed and then cut into small pieces, then mixed with palm sugar water in a ratio of 1 ; 2; 3, its mean that 1 kilo of vegetables and fruits residues is mixed with 2 liters of palm sugar water, and 3 liters of clean water, then put in a jar and stored in a cool place and not exposed to direct sunlight, then wait for 3 months and then harvest.

### Third Stage (Monitoring and Mentoring)

At this stage the activities carried out are;

a. Monitoring of the results of making eco enzyme by the PKM team

After the training is complete, the trainees bring the results of the training in the form of a jar of eco-enzyme material which will be stored properly for 3 months in their respective homes for up to 3 months, then harvested.

b. Harvesting the results of making eco enzymes.

After 3 months stored in a cool place and not exposed to direct sunlight, harvesting is carried out by taking the eco-enzyme water can be directly used for various needs as a sterilizing liquid in the tub baths, floor cleaners, wound washers and so on.

c. Ensure that housewives participating in the program continue to make eco enzyme.

A few days before harvesting, the trainees contacted Dr. marningot Tua Natalis Situmorang informed them about harvesting, then after harvesting made sure the trainees that they were making eco-enzymes again.



Figure 1. Activity Implementer Delivering a presentation related to eco-enzymes

### Work Procedures

To support the implementation of the program according to the method offered, the following are the detailed work procedures of the Eco Enzyme Program activities, in Cibuntu Village, Cibitung District, Bekasi Regency, West Java, as follows:

- a. Carry out socialization and education on waste, waste management and environmental hygiene.
- b. Carry out eco enzyme production activities.
- c. Carry out eco-enzyme harvesting activities as a source of income.
- d. Provide assistance and ensure that the eco enzyme program activities are carried out by housewives participating in the program.



Figure 2. The participants are carrying out the manufacture of eco enzymes



Figure 3. Liquid ready to be stored to produce eco enzyme

### 3. RESULTS AND DISCUSSION

Based on the problems that have been described by the partners, the proposer team with partners agreed to offer solutions to overcome the problems that exist in Cibuntu village with several approach methods as follows:

- a. Providing education and motivation to improve welfare

This is intended so that housewives have the motivation to change their fate through the creation of eco-enzyme gardens. The active participation of housewives will have an impact on household economic resilience.

The provision of education begins with providing knowledge through lectures delivered directly by Dr. Marningot Tua Natalis Situmorang about what is eco enzyme , who invented it, how to make it, what materials is this eco enzyme made of, what are the benefits of this eco enzyme so it is necessary to know and be taught how to make it, how this eco enzyme can help household income and can clean the house and the surrounding environment, after that it is followed by a question and answer session.

b. Eco enzyme garden development program

The implementation of eco enzyme gardens will provide many benefits if the program can run well. The steps that must be taken in the program are to shape the behavior of housewives so that they are motivated to participate. The meaning of eco-enzyme garden is the manufacture of eco-enzyme in large quantities and carried out within the specified time so that the harvesting is according to the specified time so that the existence of eco-enzyme will always be there because it is always harvested.

This eco-enzyme garden itself can be arranged according to the presence of the room prepared for the eco-enzyme, meaning that is not determined by the area and how much.

The manufactured it self begins by collecting the rest of the vegetables or fruit at home, then wahed, and chopped in to small pieces then mixed with palm sugar solution, then filtered and poured into a predetermined medium such as a jar and then allowed to stand for approximately 3 months and then harvested, after harvesting, the media is cleaned and then the eco-enzyme is made again like the previous procedure so continuously.

c. Assistance and program sustainability

To maintain commitment with housewives, program continuity and build teamwork, a mentoring process will be carried out. This program cannot be implemented in the short term so that the sustainability of the program is a joint commitment between the proposing team through the LPPM, Sahid University, Jakarta and housewives who drive the PKK in Cibuntu Village, Cibitung, Bekasi, West Java.

The technical assistance and sustainability of this program are agreed as follows :

- 1) Housewives who have participated in the training become a village team for owners and manager of eco enzyme gardens.
- 2) The eco-enzyme training results will be maintained and cared for properly and after harvest time, the village team will contact Dr. marningot Tua Natalis Situmorang to see the harvest and the same time to see the next eco-enzyme production
- 3) If the next harvest turns out to be a lot, then Dr. Marningot Tua Natalis Situmorang will appreciate it by giving money for the eco-enzyme harvest
- 4) Thus the process of mentoring and sustainability of this eco-enzyme garden program will be carried out forever

#### 4. CONCLUSION

Based on the results of activities in community service, several things can be concluded, including :

- a. That the provision of education and motivation to improve welfare was very attractive to housewives, so they were enthusiastically involved in implementing the ecoenzyme gardening program and really hoped that they would always be accompanied so that they continued to make enzymes. Through this community service activity, it is hoped that all housewives in Cibuntu Village can become training participants for the sustainability of the program
- b. That it was agreed that assistance would be carried out by contacting Dr. Marningot Tua Natalis Situmorang when the time has come for harvesting, so that the eco-enzyme garden is immediately planted again according to the procedures that have been obtained during the training.
- c. That it was the harvest obtained are abundant beyond the ability of housewives to use them, then Dr. Marningot Tua Natalis Situmorang will appreciate it by giving money to harvesters whose harvests are abundant.
- d. This eco-enzyme garden program will always be carried out as long as the housewives are still willing to do it

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