



## “PUPOS (PUPUK KOMPOS)” COMMUNITY EMPOWERMENT TO PROCESS AND RECYCLE HOUSEHOLD WASTE EASILY AND QUICKLY

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### Abstract

*Waste is a problem in various big cities, one of which is Medan City. Organic waste that is wet and causes foul odor needs to be dealt with quickly. One method of managing organic waste is by processing it into compost. Compost made from organic waste is very easy because it does not require a large area, a lot of equipment and costs. This community service activity aims to empower housewives through education and composting trials as an independent alternative for them to overcome household waste that can be used to make organic fertilizer that can be used alone or sold for a source of household income. The activity was carried out by the Institut Teknologi Sawit Indonesia team consisting of lecturers and students together with partners, namely housewives in Batang Kuis Village, Deli Serdang, totaling 75 people. Activities were carried out in June 2024. The method implemented in this empowerment program is a participatory method starting from education and socialization, practical application of composting, and monitoring of fermentation results while stimulating partners to be able to process waste independently which has the opportunity to produce products of economic value to increase family income. The results of this service activity achieved a score of 97% because the team succeeded in educating partners and motivating them to process waste using the composting method and reduce the burning process or piling up garbage waiting for the janitor to pick up the garbage. This activity is expected to continue for partners by continuing to provide assistance to housewives in Batang Kuis Village so that it becomes a partner business unit to increase family income.*

**Keywords:** *compost, community, fertilizer, organic, waste*

### INTRODUCTION

Waste is the residue of human efforts or activities in the form of organic and inorganic substances that can be decomposed or not decomposed, which are considered useless and disposed of into the environment. Data from the National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry (KLHK) in 2022, input from 202 districts/cities throughout Indonesia, states that the amount of national waste generation reached 21.1 million tons. Of the total national waste production, 65.71% (13.9 million tons) can be managed, while the remaining 34.29% (7.2 million tons) has not been managed properly (Kemenko PMK 2023). Waste is a problem in various big cities, one of which is Medan City. The condition of waste in Medan city is recorded at 2,000 tons per day, 800 tons end up in the landfill, then more than 1,000-1,200 tons and the rest is prone to not being handled and according to existing data in Medan city that the largest waste producer is household waste (Sinaga 2023). Household activities always produce a large amount of organic waste every day. For example, unused vegetable leaves and stems, fruit peels, leaves of trees in the yard, stale food scraps, and so on. This type of waste includes degradable waste. Many environmental problems can be caused by piles of household organic waste, including air pollution, water pollution, as a source of disease. Organic waste that is wet and

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causes foul odors needs to be dealt with quickly. One method of managing organic waste is by processing it into compost. Compost made from organic waste is very easy, does not require a large area, a lot of equipment and costs (Rahmaniah et al. 2024). Compost is a natural (organic) fertilizer that can be made from green materials and other organic materials that are added intentionally so that the decay process will be faster. Making this fertilizer can also be made by yourself by utilizing organic materials that are easily available at a relatively cheap manufacturing price (Zulvan 2014).

This organic waste problem is a problem found in Batang Kuis Village, Deli Serdang. The results of the implementation team found that this village did not have an alternative to processing organic waste other than collecting waste in landfills (TPA). In addition, it is known that housewives in Batang Kuis Village do not understand about processing organic waste from households using the Compost method which can be done independently because it is easy, cheap and fast and can even be sold to bring in additional household income. Therefore, through this community service activity, the team carried out empowerment to housewives in Batang Kuis Village through education and composting trials as an independent alternative for them to deal with household waste that can be used to make organic fertilizer that can be used alone or sold for a source of household income.

**LITERATURE REVIEW****A. Waste**

Waste is the remnants of products that are no longer used and comes from various human activities (Brunner and Rechberger 2016). Nevertheless, waste still has economic value if processed into certain products (Basu 2009). Waste can be classified into two, namely organic and inorganic. Organic waste is waste that is easily decomposed from food waste, leaves, fruits, vegetables, and the rest of kitchen/household activities. Meanwhile, inorganic waste is non-degradable waste derived from plastic, paper, and metal (Nisandi 2007). There is an alternative method of managing waste into useful products, namely making compost by using the 3R approach (Reuse, Reduce, Recycle), using optimization conditions (22 oC, pH 6.8-7.4, RH 50%) in the composting process. with the results of black compost and soil-like texture (Badan Standardisasi Nasional 2004). Compost fertilizer can be produced from organic waste with the help of microorganisms under appropriate composting environmental conditions (Badan Standardisasi Nasional 2008).

**B. Compost**

Compost is organic material consisting of plant, animal, or municipal waste that has undergone decomposition or weathering before being added to the soil. The main ingredients of compost can be household waste, leaves, alangalang straw, grasses, husks, corn stalks, animal waste, and other materials, especially those that are easily rotten. The nutrient content in organic fertilizers is not too high but this type of fertilizer has other characteristics, namely it can improve soil properties, soil structure, water holding capacity and soil cations (Nasrullah, Ibrahim, and Robbo 2023). Compost is a man-made organic fertilizer produced from the weathering (decomposition) of residual organic matter such as leaves, straw, alangalang, grasses, rice bran, corn stalks, carang-carang and animal waste that has undergone a decomposition process by decomposing microorganisms. naturally, grass, leaves and animal waste and other waste gradually rot due to the cooperation between microorganisms and the weather. The process can be accelerated by human treatment, namely by adding decomposing microorganisms so that in a short time good quality compost will be obtained (Suhastyo 2017); (Setyorini, Rasti, and Ea Kosman 2006). One alternative to handling waste into compost is a strategic step for handling household waste. Making compost with organic materials with the addition of activators for the composting



process. Microorganisms are activators derived from bacteria, fungi, and molds that act as activators for the decomposition of organic matter (Saraswati and Praptana 2017).

## METHOD

This activity was carried out by the Indonesian Palm Oil Technology Institute team consisting of lecturers and students with partners, namely housewives in Batang Kuis Village, Deli Serdang, totaling 75 people. This empowerment activity was carried out in June 2024. The method implemented in this empowerment program is a participatory method that aims to assist partners in processing household organic waste into compost. Some of the activities carried out in this method are:

### 1) Education and socialization

This activity aims to provide knowledge, understanding and at the same time increase partner awareness to process household organic waste independently easier, cheaper and faster with composting techniques. This technique is carried out by providing teaching materials and learning video presentations directly by lecturers and students to partners.

### 2) Application (composting practice)

This activity aims to provide education through direct practice of making compost by utilizing organic waste taken from partner households. The methods used are as follows:

- a. Prepare household waste that will be processed into compost.
- b. Prepare a 1.5 liter used aqua bottle as a container for composting. Do not forget that the container must have several holes and the bottom of the aqua has been cut for a cover so that the fertilizer made will not be contaminated.
- c. Then plug the top of the aqua into the soil in the pot/polybag to a depth of 10-15 cm, then put enough soil into the container as the first layer.
- d. Then put organic waste that has been mixed with husk charcoal (optional) into the container.
- e. Water with water that has been mixed with em4.
- f. Put the soil back into the container. This time the soil acts as a cover for the waste.
- g. Cover the container and water every day so that the compost dissolves, then leave it for about 10-15 days.

### 3) Monitoring the results of the fermentation of organic waste into compost "PUPOS" while stimulating partners to be able to process waste independently which has the opportunity to produce products of economic value to increase family income.

## RESULTS AND DISCUSSION

The level of understanding of partners about organic and non-organic waste and processing methods is still low at 46.45%. It is known that the waste processing that has been done so far is only throwing garbage in front of the house and waiting for the garbage officer from the village to quote (75%) while the remaining 25% process waste by burning in the yard. This activity begins by providing education and socialization about the types of household waste, namely organic and non-organic. Partners are taught to distinguish waste by type and how to process it. In addition, partners were also introduced to the composting method for processing household organic waste. Some of what is identified as organic waste that can be used as compost material are:

- 1) Vegetable waste
- 2) Stale vegetable waste (food waste)
- 3) Leftover fish, chicken, eggshells, (food waste)
- 4) Fruit waste that is first cut into small sizes
- 5) Rotten and watery fruits that cannot be eaten such as papaya, mango, orange, banana, melon and fruits commonly consumed by partners.



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Education about compost is to provide information that compost is useful for improving soil structure, so that it can make the soil looser and plants fertilized with compost can grow better and more fertile. This compost helps the government in controlling waste in the community because it reduces the volume of waste disposed of in landfills. Even the compost produced can be used as organic fertilizer that can be packaged into valuable products to increase household income.

The second method carried out by the team is the direct practical application method involving housewives to collect household waste and then separate organic and non-organic waste. Non-organic waste is collected together to be picked up by the village janitor, while organic waste is also sorted again to become compost material. Organic waste selected for composting material will be treated with a 15-day treatment and add bioactivator (EM4) (Nur, Noor, and Elma 2018), to accelerate the composting process. Conditions on day 12 are like soil because the waste has decomposed completely. Bioactivator coupled with molasses will help optimize the decomposition of organic waste components which helps avoid low carbon (C) levels which can cause a decrease in nitrogen (N) levels (Nurhayati et al. 2021); (Anggela and Kurniawati 2022). The finished compost is taught to be packaged and can be trademarked so that it can be used for personal fertilization needs or sold for profit.

The next activity after practice is to evaluate partner satisfaction with the activities carried out, namely the material, teaching methods and facilities provided. In addition to the survey, field observations were also carried out using the interview method to find out the challenges and benefits felt directly by partners from this activity. It is known that there are several benefits or support from this activity, namely 1) partners feel greatly helped by learning and new knowledge as well as the practice of making compost as an alternative to processing household waste. They do not need to fully rely on cleaning staff or burn in the yard because of the risk of fire 2) there are business opportunities that can be obtained by selling compost so that they can form a business group for housewives in Batang Kuis Village, Deli Serdang.

In addition to the benefits, it was also identified that there are challenges that can be an obstacle, namely 1) limited space because not all home yards or locations are available at the partner's house to process waste 2) the foul smell that arises due to the composting process is a little disturbing to partners if done at home 3) additional materials used for composting are considered to have to spend more capital and worries about being wrong in treatment. Although there are challenging factors felt by partners, the assessment of the team for this activity reached a score of 97% because it succeeded in educating partners and motivating them to process waste using the composting method and reduce the burning process or piling up garbage waiting for the janitor to pick up the garbage. Here are some documentations of activities with partners:





**Picture 1. Community Services Activity “PUPOS” Pupuk Kompos  
Community Empowerment to Process and Recycle Household Waste Easily and Quickly**

## CLOSING

### Conclusion

The activity of managing organic waste into useful products such as compost is an effective and efficient solution that is easy and cheap for housewives to follow in overcoming household waste problems. Household waste that was previously considered to have no economic value can be reprocessed into compost that has marketable value to become an additional source of household income. It is hoped that this activity will continue for partners by continuing to provide assistance to housewives in Batang Kuis Village so that they become one partner business unit to increase family income.

### Suggestions and Acknowledgments

We would like to express our gratitude to Batang Kuis Village - Deli Serdang, especially our partners, namely the housewives who are residents of Batang Kuis Village, who accepted us to carry out this empowerment program through a community service program. It is hoped that the collaboration between the team and Partners will continue in the next empowerment program to achieve increased capacity and quality of life for the community, especially the residents of Batang Kuis Village, Deli Serdang.

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