

**PRO-ENVIRONMENT COMMUNITY SERVICE PROGRAM: UTILIZATION OF USED COOKING OIL AND PLASTIC IN TANJUNG PINGGIR**

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**ABSTRACT**

*The issue of waste is a major problem faced by the community in Tanjung Pinggir Village, Siantar Martoba District. The existence of a waste bank in the village has not been able to fully address environmental problems caused by the accumulation of plastic waste and household waste in the form of used cooking oil. This Community Service Program (KKN) was carried out with the aim of raising public awareness of the importance of protecting the environment through an ecotheology approach. The implementation methods included processing used cooking oil into aromatherapy candles for teenage girls and mothers, and processing plastic waste into paving blocks for teenage boys and fathers. The results of the activities showed that the community was receptive and actively involved in processing waste into useful products. Aromatherapy candles and paving blocks are not only a solution for waste reduction, but also have the potential to be developed into micro, small, and medium enterprises (MSMEs) for the local community. The ecotheology approach, through the understanding that humans are caliphs on earth who are obliged to preserve it, is able to provide a religious dimension to pro-environmental activities. Thus, this activity contributes to community empowerment while supporting sustainable development.*

*Keywords: Ecotheology; Pro-Environment; Community Service Program; Used Cooking Oil; Plastic Waste*

## INTRODUCTION

Environmental issues, particularly those related to waste management, are global issues that are also felt at the local level. In various regions, including Tanjung Pinggir Village, Siantar Martoba District, waste has become a major problem that affects the quality of life of the community. Plastic waste and household waste, especially used cooking oil, have become serious problems due to suboptimal management. Plastic waste takes hundreds of years to decompose, while used cooking oil is often disposed of carelessly, polluting the environment and potentially causing health problems.

The existence of a landfill in Tanjung Pinggir Village is indeed the main location for community waste collection, but its function is more to accumulate waste rather than process it. As a result, the volume of waste continues to increase, causing various problems, ranging from unpleasant odors and environmental pollution to the potential for disease. This highlights the need for innovative efforts in waste management, so that waste does not simply end up in landfills but can be processed into more useful and economically valuable products.

In this context, the ecotheological approach is important for internalizing religious values in efforts to protect the environment. Ecotheology views humans as stewards of the earth who have a spiritual and moral responsibility to preserve nature. In Islam, the prohibition of excess (*israf*), the encouragement to maintain cleanliness, and the commandment not to cause destruction on earth form a strong theological basis for raising ecological awareness among the community. Thus, pro-environmental activities are not only interpreted as a social responsibility, but also as a form of worship.

The Real Work Lecture Program (KKN) of students from the State Islamic University of North Sumatra in Tanjung Pinggir Village was held to address these issues. This activity was aimed at processing used cooking oil into aromatherapy candles and processing plastic waste into paving blocks. The aromatherapy candles were intended for teenage girls and mothers, with the hope that they could be developed into MSME-based home businesses. Meanwhile, the paving blocks are intended for teenage boys and fathers, to provide broader business opportunities in the field of simple construction. By integrating ecotheological values, this activity is expected not only to reduce waste but also to strengthen the religious awareness of the community to protect the environment while improving economic welfare.

## Literature Review

### 1. Ecotheology and Environmental Awareness

Ecotheology is an approach that connects religious teachings with environmental issues. In the Islamic perspective, humans are positioned as caliphs on earth who have an obligation to preserve nature and not cause damage (QS. Al-A'raf: 56). These religious values can serve as a strong foundation for building ecological awareness in society. According to Keraf (2010), moral and religious approaches play an important role in internalizing environmentally friendly behavior because they are able to touch the spiritual dimension of human beings. Therefore, ecotheology is relevant as a basis for mobilizing community participation in environmental management.

### 2. Used Cooking Oil Management

Used cooking oil is used cooking oil that, if disposed of carelessly, can pollute the environment and reduce groundwater quality (Pratiwi, 2019). However, used cooking oil can be processed into various products, such as biodiesel, soap, and candles. Research by Wahyuni & Lestari (2021) shows that candles made from used cooking oil have economic potential because they are low in production costs and can be developed as household products. Thus, processing used cooking oil into aromatherapy candles not only reduces waste but also opens up opportunities for creative businesses.

### 3. Plastic Waste Management

Plastic waste is one of the biggest contributors to environmental pollution because it is difficult to decompose. According to Jambeck et al. (2015), Indonesia ranks second in the world after China in terms of plastic waste contributing to the ocean. One creative solution is to recycle plastic into useful products, such as paving blocks. Research by Hartati (2020) shows that paving blocks made from plastic waste have sufficient compressive strength to be used for light construction purposes. This proves that simple innovations can have a real impact on waste management.

### 4. Community Empowerment through MSMEs

Community-based waste management is in line with the concept of circular economy, where waste is processed into products with added value. According to Mulyani (2018), community

empowerment activities will be more successful if they are linked to economic improvement through the development of MSMEs. In this context, aromatherapy candles can be developed by young women and mothers as a home business, while paving blocks can be developed by fathers and young men as a small business in the field of simple construction. Thus, waste management not only reduces environmental problems but also strengthens the economic independence of the community.

## RESEARCH METHODS

The ecotheology-based community service program in Tanjung Pinggir Village was carried out in several stages. First, students conducted initial observations to identify environmental problems, particularly those related to the existence of a landfill that caused the accumulation of plastic waste and used cooking oil. Second, they conducted outreach to the community about the negative impact of waste on the environment and the importance of waste management from an ecotheological perspective, namely the obligation of humans to protect the earth as a gift from God.

The next stage was practical training, which was divided into two main activities. The first training was aimed at teenage girls and mothers, namely processing used cooking oil into aromatherapy candles that have both practical and economic value. The second training was aimed at teenage boys and fathers, namely making paving blocks from plastic waste that can be developed into a simple construction-based business. During the activities, students acted as facilitators, while the community was actively involved in the product manufacturing process.

This activity was also carried out using a participatory approach, in which the community was not only the beneficiary, but also a partner in designing, implementing, and developing the product. Evaluation was carried out by measuring community participation, the quality of the products produced, and the potential for developing the activity into an independent MSME-based business unit.

### Activity Stages

1. Initial Observation and Problem Identification
  - a. KKN students conducted field surveys to understand the environmental conditions in Tanjung Pinggir Village.
  - b. It was identified that the main problems were plastic waste and household waste (used cooking oil).
  - c. The final waste disposal site (TPA) was upgraded into a processing and innovation center.
2. Socialization and Ecotheology Education
  - a. Conducting outreach to the community about the importance of protecting the environment from a religious perspective.
  - b. Linking activities to verses from the Qur'an that emphasize the role of humans as khalifah fil ardh (stewards of the earth) and the prohibition of environmental destruction.
  - c. Promoting awareness that recycling is not only a practical necessity, but can also be a selling point.
3. Training in Making Environmentally Friendly Products
  - a. Aromatherapy candles from used cooking oil
    - Participants: teenage girls and mothers.
    - Process: (1) Soak used cooking oil with activated charcoal for 24 hours, (2) Filter the used cooking oil, (3) Heat the used cooking oil, (4) Mix in stearic acid and wait until it dissolves, (5) Mix in natural colors and fragrances, (5) Pour into small containers.
    - Objective: to reduce waste cooking oil while opening up opportunities for home businesses.
  - b. Paving blocks from plastic waste
    - Participants: teenage boys and fathers.
    - Process: (1) Shredding plastic, (2) Melting plastic with the help of used oil, (3) Adding sand, (4) Molding paving blocks, (5) Cooling.
    - Objective: to reduce plastic waste while opening up paving block production businesses for the community.
4. Product Testing and Implementation
  - a. Aromatherapy candles are used as household products, tested for flame resistance and aroma.
  - b. Paving blocks are tested simply with light loads and applied around the KKN post road area.

5. Evaluation and Follow-up Plan
  - a. The community provides feedback on product quality.
  - b. Joint discussion to explore the potential for development into a local SME.

## **RESULTS AND DISCUSSION**

### **Activity Results**

The ecotheology-based community service activities in Tanjung Pinggir Village produced two forms of waste management innovation, namely aromatherapy candles made from used cooking oil and paving blocks made from plastic waste.

First, training on processing used cooking oil into aromatherapy candles was provided to teenage girls and mothers. The results showed that the community could easily understand the stages of candle making, from filtering used cooking oil, mixing additional ingredients, to molding the candles. The resulting candles not only have attractive shapes and pleasant aromas, but also have the potential to be sold as affordable MSME products.

Second, training on making paving blocks from plastic waste was aimed at teenage boys and fathers. The manufacturing process involves melting plastic, mixing it with sand, and then molding it into paving blocks. The results showed that the paving blocks produced were strong enough to be used on walkways and home yards. The community assessed that this product has the potential to be developed as a simple construction business because the raw materials are abundant and the production process is relatively easy.

### **Discussion**

The processing of used cooking oil and plastic waste has a positive impact on the community, both environmentally and economically. Environmentally, this activity helps reduce the volume of waste accumulating at the Tanjung Pinggir Village Landfill. Plastic waste, which is difficult to decompose, can be processed into useful products, while used cooking oil, which was previously disposed of indiscriminately, is now reused.

Economically, this activity opens up opportunities for the community to develop small waste-based businesses. Aromatherapy candles aimed at teenage girls and mothers can be marketed as household products, while paving blocks managed by teenage boys and fathers have market potential in the field of light construction. This is in line with the concept of a circular economy, where waste is reprocessed to create added value.

In addition, the ecotheology approach has proven effective in raising public awareness. By emphasizing that protecting the environment is part of worship and responsibility as stewards of the earth, the community is more motivated to participate actively. This activity shows that the internalization of religious values can strengthen environmental programs so that they are more accepted by the community.

These results are in line with previous studies that confirm that community empowerment through waste management can provide dual benefits, namely reducing environmental pollution while improving welfare (Hartati, 2020; Wahyuni & Lestari, 2021). Thus, this Community Service Program (KKN) activity can be used as a model of service that is not only practical but also based on theological values relevant to the lives of the local community.

## **CONCLUSIONS**

The ecotheology-based Community Service Program (KKN) in Tanjung Pinggir Village, Siantar Martoba District, successfully provided an alternative solution to the problem of waste accumulation at the Final Disposal Site (TPA). Through training in processing used cooking oil into aromatherapy candles and plastic waste into paving blocks, the community not only gained new skills but also an understanding of the importance of protecting the environment as part of their religious responsibility. The products produced have the potential to be developed into small-scale businesses based on MSMEs, which in turn can improve the economic well-being of the community. Additionally, the integration of ecotheology values has proven effective in strengthening the community's motivation to care more about the environment while also making it a form of social worship.

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