Building Environmental Awareness With A Waste Incineration and Maintenance Program in Tegal Sari Village, Walantaka District, Serang City

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Abstract.

This community service program aimed to enhance environmental awareness through the development and maintenance of a controlled waste incineration facility in Tegal Sari Village, Walantaka District, Serang City. The program was implemented using a participatory and educational approach that actively involved community members in the planning, construction, utilization, and maintenance processes. Activities included environmental education, group discussions, hands-on training, and collective action, enabling residents to understand the negative impacts of improper waste burning on health and the environment. The results indicated a significant shift in community attitudes and behaviors toward more responsible waste management practices. Residents became more aware of environmental risks and demonstrated increased participation in maintaining cleanliness and sustainability. Furthermore, the program strengthened social cohesion, encouraging collective responsibility and long-term engagement in environmental protection. The integration of technical solutions and social empowerment proved effective in fostering sustainable behavioral change. This program contributed not only to environmental improvement but also to community capacity building. The model has strong potential for replication in other rural areas facing similar waste management challenges, emphasizing the importance of community-based environmental interventions.

Keywords: *Environmental Awarenes; Community Participation; Waste Management; Incineration Facility and Rural Sustainability.*

I. INTRODUCTION

Community service is one form of implementation.*three pillars of higher education*, which focuses on community empowerment through the transfer of applicable knowledge, technology, and skills. This activity aims to encourage communities to recognize local problems and develop solutions independently and sustainably (Rohma, et al., 2025). Community service activities involve not only outreach but also intensive mentoring that engages the community in the learning process and sharing solutions to shared problems.One environmental issue that remains a challenge in many parts of Indonesia, including urban and rural areas, is household waste management. Poorly managed waste impacts various aspects of life, such as public health, soil and water pollution, and the decline in environmental aesthetics. One common practice that has negative impacts is open burning of waste without proper controls (Malik et al., 2025). This practice produces hazardous gas emissions that can trigger respiratory problems and air pollution in the surrounding environment.In the context of Tegal Sari Village, Walantaka District, Serang City, this phenomenon is also evident in the unorganized waste management practices. Residents tend to burn waste in locations that do not adhere to safe management practices, resulting in air pollution and unpleasant odors that become serious problems that affect residents' quality of life. This problem demonstrates a low level of environmental awareness and a lack of adequate facilities for proper waste management.The community service program "Construction and Maintenance of Waste Incinerators" was created in response to this problem. This program is designed to provide immediate solutions while simultaneously improving*environmental awareness*community.

The construction of planned waste incineration facilities equipped with smoke control systems is expected to minimize the negative impacts of open waste burning, thereby contributing to improved environmental quality. This approach aligns with research showing that the construction of appropriate waste management facilities can help communities adopt better practices in domestic waste management (Rohma et al., 2025).This program focuses not only on building physical facilities but also on education and development. Outreach activities on the negative impacts of improper waste incineration and the importance

of responsible waste management are an integral part of the entire program. This type of environmental education is key to fostering a caring attitude and pro-environmental behavior among the community, which ultimately supports the sustainability of good waste management practices (Malik et al., 2025).Experience in various previous community service programs has shown that when communities are actively involved in the training and implementation of new methods, their understanding and acceptance of proper practices are strengthened.

For example, active community involvement in the construction of waste incineration facilities not only provides technical skills but also strengthens their sense of ownership of the facility and responsibility for its maintenance (Nurilhuda et al., 2025).Another factor influencing the success of this program is support from local stakeholders, such as the village government, community leaders, and local youth organizations. This collaboration is crucial for creating a support network capable of sustaining the program after the formal community service activities are completed. In this context, the role of local leaders as agents of change is highly strategic because they have a strong social influence on daily community norms and practices (Nurilhuda et al., 2025). Furthermore, building environmental awareness is not an instant process, but rather the result of continuous learning that involves strengthening knowledge, attitudes, and behaviors. Therefore, this program is designed in stages, starting with basic socialization, technical training, hands-on practice, and periodic evaluations involving active community participation. This approach is expected to create lasting behavioral changes and positively impact environmental quality in Tegal Sari Village.

Thus, this community service program is expected to not only resolve technical waste management issues but also significantly increase environmental awareness in the local community, thereby creating a cleaner, healthier, and more sustainable environment.The phenomenon of community service activities related to waste management at the village level shows that many people still view waste as a trivial and individual problem, rather than a collective issue with broad impacts on environmental quality. This behavioral pattern is characterized by the habit of throwing and burning waste carelessly without considering the long-term impacts on health and the environment. This phenomenon is not only caused by limited facilities, but also by low environmental literacy and a lack of ongoing education (Malik et al., 2025). In many cases, people only realize the importance of waste management after experiencing health problems, unpleasant odors, or visual pollution that disrupts the comfort of life. This shows that changes in community behavior are highly dependent on a social learning process that is direct, contextual, and based on real experiences. Therefore, community service activities that combine education, mentoring, and the provision of facilities are a relevant strategy to address this phenomenon (Nurilhuda et al., 2025).

Fig 1. Community Service Activity Team

Source: Community Service Team Observation, 2025

The implementation of activities within this program is designed systematically and participatory, starting from the socialization stage, joint planning, facility construction, to ongoing guidance and evaluation. The community is involved from the outset in discussions regarding the location, design, and maintenance mechanisms of the incinerator to foster a sense of ownership and collective responsibility. This participatory approach has proven effective in enhancing the program's sustainability, as the community becomes not only the beneficiary but also the primary agent of change (Rohma et al., 2025). Furthermore, implementation of activities also includes technical training on safe incineration procedures, residue management, and the importance of waste sorting before incineration. Thus, this activity does not stop at

physical construction alone but is oriented towards behavioral transformation and increasing environmental awareness as a whole. Structured and locally-needed implementation is expected to create a more effective, healthy, and sustainable waste management system for the Tegal Sari Village community.

Previous community service activities focused on waste management and increasing environmental awareness have demonstrated results that further reinforce the urgency and effectiveness of intervention approaches for Tegal Sari Village. For example, a community service program conducted in Balunganyar Village successfully increased community awareness of waste sorting and disposal through a series of outreach programs and the provision of standardized waste bins, resulting in long-term behavioral changes (Rohma et al., 2025). In Bawuran Village, activities involving technical training in waste management and the formation of environmental youth groups reduced the volume of waste indiscriminately burned in residential areas (Nurilhuda et al., 2025). Meanwhile, educational interventions on the importance of household waste management implemented in peri-urban areas demonstrated a significant increase in community knowledge about the impact of waste burning on air quality and public health (Malik et al., 2025). In a more specific context, similar community service studies in several villages outside Java showed that an approach combining outreach, hands-on demonstrations, and intensive mentoring was able to strengthen residents' commitment to participate in maintaining the waste management facilities they built (Sulistyani & Wijaya, 2024).

Furthermore, community service activities accompanied by the formation of*village environmental forum* This has been shown to increase active community participation in the planning and evaluation of waste incineration plant construction and maintenance activities, fostering a sense of ownership and responsibility for their environment (Putra & Sari, 2023). Thus, this initial series of activities confirms that waste management is not merely a technical issue, but also a cultural shift in community behavior that requires a comprehensive, collaborative, and sustainable approach.The implications of this community service activity encompass social, environmental, and sustainable aspects of village development. Socially, this program is expected to shape a new mindset among the community regarding the importance of waste management as a shared responsibility, not just an individual matter. Through education and direct involvement in the construction and maintenance of waste incinerators, the community will experience a behavioral transformation from passive to more active and concerned about the condition of their environment.From an environmental perspective, the presence of controlled incineration facilities is expected to reduce the practice of illegal burning, which has been a source of air pollution, unpleasant odors, and health problems.

Furthermore, this activity also has implications for strengthening the community's capacity to manage local issues independently, thus serving as a model for replication for other villages with similar problems.The novelty of this community service activity lies in the integration of the construction of a physical facility in the form of a controlled waste incinerator with an educational-participatory approach oriented towards changing community behavior. Unlike similar programs that generally focus solely on providing facilities or outreach, this activity combines technical, social, and cultural aspects simultaneously. The community is not only invited to understand the dangers of improper waste management but is also actively involved in the planning, construction, utilization, and maintenance of the existing facility. This approach creates a sense of ownership (*sense of ownership*) strong, thus ensuring the sustainability of the program. Furthermore, another novelty is the emphasis on facility maintenance as a key part of the program, not just its construction. This ensures that the expected behavioral changes are not temporary but become collective habits that are deeply rooted in the daily lives of the Tegal Sari Village community.

II. METHODS

This activity explains the approach, stages, and implementation mechanisms for community service activities focused on the construction and maintenance of a waste incinerator as a means of raising environmental awareness in Tegal Sari Village. The methods used are designed to be participatory, educational, and applicable so that the community is not merely an object, but a primary subject throughout the entire activity process.

Activity Approach

This activity uses a participatory-educational approach, involving the community from the planning stage through evaluation. This approach was chosen because it has been proven to increase a sense of ownership (*sense of ownership*) and citizen responsibility for the program being implemented. Active community involvement in every stage of community service activities will strengthen the program's sustainability and encourage more permanent behavioral changes (Rohma, et.al, 2025). An educational approach is also used through outreach, group discussions, and simulations of waste management practices so that the community gains conceptual understanding and technical skills simultaneously (Malik, et.al, 2025).

Location and Time of Implementation

This community service activity will be held in Tegal Sari Village, Walantaka District, Serang City. This location was chosen based on initial observations showing high rates of open waste burning and a lack of adequate waste management facilities. The implementation period is planned for one month, namely in September 2025, with the activity intensity adjusted to the community's availability to avoid disrupting their primary activities.

Subject and Target of Activities

The participants were the Tegal Sari Village community, consisting of heads of families, youth, housewives, and village officials. The main objectives of this activity were to increase environmental awareness, change waste management behavior, and establish a waste incineration facility management group. The involvement of various community groups is crucial to creating an inclusive and sustainable management system (Nurilhuda et al. 2025).

Stages of Activity Implementation

The implementation of activities is carried out in stages, namely:

1. Preparation Stage, including field observation, problem identification, coordination with the village government, and preparation of technical plans for facility construction.
2. Socialization and Education Stage, in the form of counseling on the impact of open waste burning, the importance of proper waste management, and introduction to controlled burning systems.
3. Implementation Stage, namely the construction of a waste incinerator with residents, accompanied by technical training on use and maintenance.
4. The Mentoring and Evaluation Stage, in the form of monitoring the use of facilities, reflective discussions, and technical improvements if necessary.

This phased approach is in line with findings that emphasize the importance of continuity between education, practice, and evaluation in environmental service-based activities (Malik, et al., 2025).

Activity Implementation Schedule

Table 1. Schedule for Implementing Community Service Activities

Sunday	Type of activity	Expected Output
I	Observation, coordination, and socialization	Program agreement and initial understanding
II	Environmental education and technical training	Increased knowledge and skills
III	Construction of a waste incinerator	Facilities built and ready to use
IV	*Mentoring, evaluation, and reflection*	*Commitment to care and sustainability*

Source: Community Service Team, 2025.

Table 1 shows the stages of community service activities designed for one month in September 2025. Each week has a different focus, from preparation to evaluation. This pattern allows for a gradual, rather than instant, community adaptation process. This approach aims to ensure that the resulting behavioral changes are not temporary but become lasting habits.

Data Collection and Evaluation Techniques

Data was collected through observation, short interviews, group discussions, and activity documentation. Evaluation was conducted both formatively and summarily to assess changes in community knowledge, attitudes, and behavior. Participatory evaluation can foster collective reflection and strengthen community commitment to program sustainability (Nurilhuda et al., 2025).

III. RESULT AND DISCUSSION

Activity Results

Community service activities in Tegal Sari Village during September demonstrated positive results in various aspects, particularly in increasing environmental awareness, changing waste management behavior, and fostering collective community participation. These results were obtained through field observations, focus group discussions, short interviews, and activity documentation. Key indicators observed included the level of community involvement, understanding of the impacts of waste incineration, and the utilization and maintenance of the collectively constructed incineration facility.Overall, the community demonstrated high enthusiasm for the activities.

In the initial stages, most residents attentively participated in the environmental outreach and discussion activities. They expressed various complaints about the waste problem, ranging from odor and smoke from burning to frequent health problems. These discussions marked the beginning of a shift in the community's mindset, from viewing waste as a personal matter to a shared problem requiring collective solutions.Following educational activities, public understanding of the negative impacts of open waste burning has increased. Residents have begun to understand that smoke from burning can contain hazardous substances, pollute the air, and trigger respiratory problems. Furthermore, they have begun to understand the importance of waste sorting and the use of safer and more controlled incineration facilities.

Table 2. Level of Community Participation in Activities

Type of activity	Participation Rate	General Information
Environmental socialization	Very high	Enthusiastic and active
Technical training	High	Focused and participatory
Facility construction	High	Strong mutual cooperation
Follow-up assistance	Currently	Stable and consistent

Source: Community Service Team Observations, 2025

The table above illustrates the level of community participation in each stage of the activity. Socialization and facility construction demonstrated very high participation due to the direct involvement of many residents. Technical training also received a positive response due to its practical nature. Meanwhile, follow-up assistance fell into the moderate category because it required a longer time commitment from the community.The change in community understanding was also evident in how they re-explained the material presented. Residents were able to explain the difference between indiscriminate burning of waste and controlled burning. They also began to understand that facility maintenance, not just construction, is crucial to the program's success.

Table 3. Changes in the Level of Public Understanding

Aspects of Understanding	Initial Conditions	Final Condition
The impact of smoke from burning	Low	High
Proper waste management	Low	High
The importance of facility maintenance	Very low	High
Environmentally friendly behavior	Low	High

Source: Resident interviews and reflections, 2025

The table above shows changes in community understanding before and after the activity. At the beginning of the activity, most residents did not fully understand the environmental impacts of waste incineration. After education and hands-on practice, their understanding improved significantly, particularly in aspects of safety, health, and environmental sustainability.In terms of facility utilization, residents have begun using the incinerator regularly. They have also formed informal agreements regarding usage schedules and the division of maintenance tasks. Some residents have even taken the initiative to develop simple rules to keep the facility clean.

Table 4. Pattern of Waste Incineration Facility Utilization

Usage Patterns	Dominant Category	General Information
Routine use	Majority	It has become a habit
Occasional use	Part	Still adapting
Do not use	Minority	Needs assistance

Source: Field observation, 2025

The table above shows that the majority of residents have been using the facilities regularly. Some residents are still adapting, while a small group has not yet fully utilized the facilities. This data serves as the basis for the community service team to design further mentoring strategies to ensure equitable participation by all residents.As a result, residents reported feeling more comfortable with the cleaner environment and reduced smoke from burning. Several housewives stated that they are now more careful about burning trash and prefer to separate the types of waste first. Village youth also demonstrated their commitment by helping clean up the area around the facility.

Fig 2. Development of Waste Management

Source: Community Service Team Observation, 2025

These results demonstrate that the activities not only impact knowledge but also shape new, more environmentally friendly habits. This transformation forms a crucial foundation for the program's sustainability.

Discussion

This discussion section interprets the results of community service activities analytically by linking them to theory, field practice, and findings from similar activities. The analysis aims to understand the significance of behavioral change, the effectiveness of participatory approaches, the role of physical facilities, and challenges to program sustainability. The discussion is structured into four subsections to systematically demonstrate the relationship between empirical findings and scientific references.

1. Changes in Community Environmental Awareness

The results of the activity indicate a shift in the perspective of the Tegal Sari Village community regarding waste management. Prior to the activity, most residents viewed waste burning as a common practice without considering the environmental and health impacts. After participating in a series of outreach activities, discussions, and hands-on activities, the community began to understand that open burning contributes to air pollution, respiratory problems, and environmental degradation. This shift marked the emergence of a more reflective and critical environmental awareness.This finding aligns with reports that community-based educational approaches can improve residents' understanding of environmental impacts and foster responsible attitudes toward waste management (Elviana et al., 2025). Similar findings from other activities indicate that environmental awareness is not formed instantly, but rather through social interaction, collective discussion, and hands-on practice (Beri, 2025). Therefore, the changes in attitudes among the Tegal Sari Village community are the result of a continuous social learning process, not simply the result of one-way information delivery.

2. The Role of Facilities as Triggers for Behavioral Change

The provision of controlled waste incineration facilities in this activity serves not only as a technical tool but also as a catalyst for behavioral transformation in the community. These facilities serve as concrete channels connecting knowledge with real-world practices. When residents have access to safe and structured facilities, they are more motivated to change long-standing habits that are detrimental to the environment. Darmadi et al. explained that the existence of waste management facilities can strengthen the adoption of environmentally friendly behaviors because it provides convenience and a sense of collective responsibility

(Darmadi, et al, 2023). This is reinforced by Putra & Sari, who found that direct practice through environmental facilities can foster functional awareness, namely awareness that is not only cognitive but also operational (Putra & Sari, 2023). In the context of Tegal Sari Village, the participatory design of the incineration facility fosters a sense of ownership, so that residents not only use it but also maintain and care for it.

3. Social Dynamics and Social Capital in Environmental Management

Community-based environmental management is inextricably linked to its social dynamics. This activity demonstrates that the process of facility construction and joint maintenance fosters more intensive social interactions among residents. Discussions, mutual assistance, and role allocation create collaborative spaces that strengthen social cohesion.The success of environmental programs is largely determined by social capital in the form of trust, shared norms, and social networks (Beri, 2025). Active community involvement in every stage of the program fosters a sense of ownership (Elviana et al., 2025). A similar trend is evident in Tegal Sari Village, where collective involvement not only strengthens social ties but also creates an informal social control system that encourages residents to consistently maintain environmental cleanliness.

4. Sustainability Challenges and Program Strengthening Strategies

While these activities have demonstrated positive impacts, the main challenge that needs to be addressed is the long-term sustainability of environmentally friendly behaviors. Behavioral changes tend to weaken if not accompanied by ongoing reinforcement mechanisms. Munandar emphasized that environmental education needs to be carried out repeatedly to prevent behavioral regression (Munandar, 2024). Other activities have also found that program sustainability is significantly influenced by the presence of local institutions that formally manage the activities (Kristion, 2025). In the context of Tegal Sari Village, sustainability can be strengthened through the formation of a village environmental management group, integration of the program into the village's routine agenda, and collaboration with village officials. This strategy allows the program not only to survive but also to develop into an adaptive social learning model.

Fig 3. Evaluation of Community Service Activities
Source:Community Service Team Observation, 2025

IV. CONCLUSION

This community service activity has had a positive impact on improving public understanding, attitudes, and behaviors regarding more responsible waste management. Through an educational and participatory approach, the community not only learned about the negative impacts of open waste burning but also became directly involved in the planning, construction, use, and maintenance of more controlled incineration facilities. The results of the activity demonstrate a shift in residents' mindset, from a passive attitude to a more concerned and active commitment to environmental cleanliness. The collaboratively constructed facilities encourage more focused waste management practices and reduce the practice of indiscriminate burning. Furthermore, this activity strengthens social ties between residents through cooperation, mutual assistance, and collective discussion, fostering social capital, a crucial foundation for the

program's sustainability.Thus, this activity serves not only as a technical solution to the waste problem but also as a social learning tool that builds collective awareness. The integration of education, facility provision, and active community involvement is key to the program's success. With continued support from the village government and the community, this program has the potential to become a model for community-based waste management that can be replicated in other areas with similar characteristics.

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