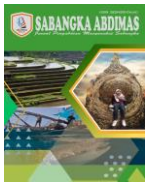

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COMMUNITY BASED WASTE SEGREGATION EDUCATION AND COMPOSTING INNOVATION USING THE OCTACO METHOD IN NALUK VILLAGE

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Abstract: *Household waste management remains a critical environmental issue in Indonesia, particularly due to low public awareness of waste segregation practices. This community service program aimed to enhance the knowledge, awareness, and skills of residents in Naluk Village, Sumedang Regency, regarding waste separation and organic waste processing into compost using the OCTACO method. A qualitative and participatory approach was employed through observation, interviews, educational sessions, and hands on composting demonstrations. The program was conducted over one month and involved local authorities, waste bank communities, and residents. The results indicate a significant improvement in participants' understanding of waste classification and environmentally friendly waste management practices. The OCTACO composting method proved to be practical, odor minimizing, and faster than conventional composting techniques. Overall, the program contributed to reducing household waste volume, strengthening environmental awareness, and promoting sustainable community based waste management by transforming organic waste into valuable compost.*

Abstrak: Pengelolaan sampah rumah tangga merupakan permasalahan lingkungan yang semakin mendesak di Indonesia, khususnya terkait rendahnya kesadaran masyarakat dalam melakukan pemilahan sampah. Kegiatan pengabdian kepada masyarakat ini bertujuan untuk meningkatkan pengetahuan, kesadaran, dan keterampilan warga Desa Naluk, Kabupaten Sumedang, dalam memilah sampah serta mengolah limbah organik menjadi pupuk kompos menggunakan metode OCTACO. Metode yang digunakan bersifat kualitatif dan partisipatif melalui observasi, wawancara, sosialisasi, serta praktik langsung pembuatan kompos. Kegiatan dilaksanakan selama satu bulan dengan melibatkan perangkat desa, bank sampah, dan masyarakat setempat. Hasil kegiatan menunjukkan adanya peningkatan pemahaman warga mengenai klasifikasi sampah dan teknik pengomposan yang ramah lingkungan. Metode OCTACO dinilai efektif karena proses pengomposan lebih cepat, minim bau, dan mudah diterapkan di tingkat rumah tangga. Program ini berkontribusi dalam mengurangi volume sampah rumah tangga, meningkatkan kesadaran lingkungan, serta mendorong pemanfaatan sampah sebagai sumber daya bernilai guna secara berkelanjutan.

INTRODUCTION

Waste is defined as material that no longer has functional value, is unused or unwanted, and arises as a result of human activities rather than natural process (Marlina et al., 2023). At present, waste has become a highly serious environmental issue faced by Indonesian society as a whole. Household waste is generated on a daily basis, primarily by homemakers, in both organic and inorganic forms. Unfortunately, much of this waste is often disposed of indiscriminately in various locations, resulting in environmental degradation and adverse ecological impacts. The volume of waste generated annually continues to increase in line with population growth (Sri Wahyuningsih, Bidarita Widiati, Tina Melinda, 2023).

Public awareness of waste segregation is critically important, as it reflects a sense of environmental ownership and responsibility shared by individuals within the community. The World Health Organization has emphasized that improper waste disposal poses serious health threats to both humans and the environment, including the spread of disease, pollution, and negative impacts on children's health (WHO, 2024). From a theoretical perspective, the development of public awareness can be examined through multiple disciplinary lenses (Rendi Pramuja et al., 2022). Within the educational framework, participation is understood as a behavioral response to received stimuli, whereby such responses are shaped by the expectation of perceived benefits.

Beyond exerting pressure on environmental carrying capacity, household waste problems are closely associated with social and behavioral aspects of the community. Several studies have demonstrated that low levels of waste segregation at the source are not merely attributable to limited infrastructure, but are more strongly influenced by insufficient knowledge, attitudes, and environmental awareness among residents (Guerrero et al., 2013; Zhang et al., 2021). In this context, environmental education plays a strategic role as an instrument for behavioral change, as it is capable of reshaping community mindsets from merely "disposing of waste" toward "managing resources" in a responsible manner. Active community participation in waste segregation has been shown to reduce the burden on landfills while simultaneously enhancing the effectiveness of sustainable waste management systems (Wilson et al., 2015).

Furthermore, community based waste management approaches through the processing of organic waste into compost are regarded as particularly relevant solutions, especially in rural areas. Household scale composting not only contributes to reducing waste volumes but also generates value added products that can be reused for agriculture

and home gardening (Bernal et al., 2017). Simple technological innovations, such as modifications of the Takakura method—including the OCTACO method—demonstrate significant potential to accelerate the decomposition process, minimize unpleasant odors, and improve compost quality (Muharram et al., 2024). Therefore, integrating waste segregation education with the application of practical composting technologies represents a key strategy for promoting behavioral change toward sustainable and locally self reliant waste management.

Based on surveys and observational activities, it was identified that community members still possess limited knowledge regarding proper waste segregation processes (Marlina et al., 2023). Waste classification into several categories—namely organic waste, inorganic waste, and residual waste—is essential, as a portion of waste can be further processed into compost, while inorganic waste holds economic value. Organic waste includes food scraps and yard waste; inorganic waste consists of used detergent packaging and food wrappers; whereas residual waste comprises diapers, sanitary pads, and cigarette butts (Rendi Pramuja et al., 2022)

The most urgent and predominant issue faced by Naluk Village is waste management, particularly waste segregation. Based on interviews with the Village Secretary, Mr. Atep Dian, residents of Naluk Village have not yet been sufficiently educated on segregating organic, inorganic, and hazardous waste (B3). Consequently, the village administration requested student involvement to help transform residents' mindsets regarding proper waste segregation practices.

Processing organic waste into compost offers substantial benefits for the community. The village's existing potential allows for the application of the OCTACO composting method, a modification of the Takakura concept, which accelerates the composting process and produces higher quality compost. This demonstrates that simple technological innovations can effectively reduce household waste volumes while providing both economic and environmental benefits (Muharram et al., 2024). Based on the foregoing description, the KKN Group 26 of Universitas Muhammadiyah Bandung established a waste management program as one of its core programs, entitled "Community Based Waste Segregation Education And Composting Innovation Using The OCTACO Method In Naluk Village"

METHOD

The community service program was conducted in Naluk Village, Cimalaka Subdistrict, Sumedang Regency. Based on surveys and observational activities, it was identified that residents possessed limited knowledge regarding proper waste segregation practices. In addition to educational socialization sessions, the implementation team also conducted demonstrations on the segregation of organic and inorganic waste. The primary objective of this *Kuliah Kerja Nyata* (KKN) program was to enhance community awareness and capacity in sorting and processing household waste. The methodological approach adopted in this program was qualitative and participatory, in which data were collected through direct observation and interviews. Local stakeholders from Naluk Village were actively involved from the initial planning stage through to evaluation. This approach was essential, as the success of waste management programs is highly dependent on active community participation (Rendi Pramuja *et al.*, 2022; Fiqhia Ratna Azhari *et al*.,2025).

The community service activities were carried out over a one month period, from August 6 to September 5, 2025. One of the main focuses of the program was socialization on waste management and utilization through demonstrations of compost production using the OCTACO method. These activities not only engaged community members but also required strong collaboration with key stakeholders, including the Village Head, Hamlet Heads, neighborhood leaders (RT/RW), and local community organizations such as the waste bank committee and its members in Naluk Village.

To further educate and empower the community to actively participate in waste segregation, the program also collaborated with the local waste bank community to ensure a shared understanding of proper waste management among all community elements. This collaboration was intended to enhance the efficiency of program implementation and to generate sustainable impacts on community behavior in waste segregation and management practices (Hartawan, I P, 2023).

The stages of program implementation were as follows:

(1) initial environmental observation in Naluk Village;
(2) problem identification and formulation of solutions related to waste management in Naluk Village;
(3) discussions with the Village Head, Hamlet Heads, village officials, and residents regarding plans for community education on waste management; and

(4) implementation of educational activities on waste segregation and workshops on OCTACO compost production within the Naluk Village community.

The overall implementation process is illustrated in the diagram presented in the following figure.

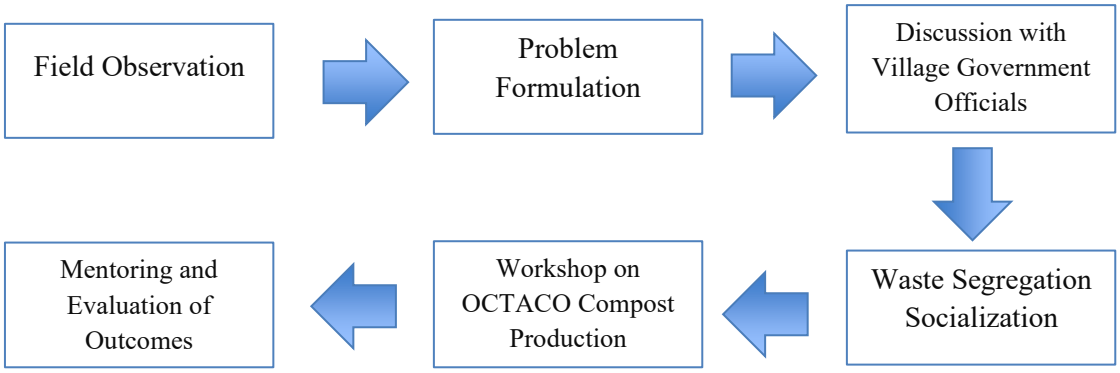

Figure 1. Implementation stages of waste segregation and OCTACO composting activities

RESULTS AND DISCUSSION

This activity was conducted as part of the *Kuliah Kerja Nyata* (KKN) program by Group 26 of Universitas Muhammadiyah Bandung in Naluk Village, Cimalaka Subdistrict, Sumedang Regency, from Wednesday, August 6 to September 5, 2025. One of the main programs implemented was waste segregation education and the production of compost using the OCTACO method. The activity involved residents of Hamlet 01 in Naluk Village, covering five neighborhood units (RT) and two community units (RW), as well as members of the local waste bank team, and was held at the Naluk Village Sports Hall. A total of 31 community members participated in the program.

The initial session of the activity consisted of educational sessions on waste segregation, defined as the process of separating waste according to its type at the source in order to enable more effective management, such as recycling, waste reduction, and environmental pollution prevention (Utomo et al., 2025). The session introduced waste classification into organic, inorganic, residual, and hazardous (B3) categories. During this session, it was observed that many residents were unfamiliar with the differences between waste categories and the appropriate waste bins for each type.


Figure 2a and 2b. Delivery of waste management educational materials by KKN students

The second session was followed by a presentation on the OCTACO composting method, which aimed to educate residents about the OCTACO compost model. The presentation and hands on practice highlighted the advantages of the OCTACO method compared to conventional composting techniques. The OCTACO model offers a faster composting process, minimizes unpleasant odors during the decomposition of organic waste, and produces compost with higher nutrient quality. Essentially, OCTACO represents an innovation developed by Universitas Muhammadiyah Bandung, derived from a modification of the Takakura composting basket concept. The OCTACO method utilizes a circular basket combined with cocopeat and *kasgot* as starter materials to initiate and accelerate the composting process (Muharram et al., 2024).

Following the presentation session, a hands on composting practice was conducted, during which residents were guided to directly apply the OCTACO composting method. The composting practice utilized a circular basket as the main container, along with cocopeat and *kasgot* as starter materials. The procedure began with the addition of brown materials such as dried leaves, straw, cardboard, rice husks, and coconut fiber. This was followed by the incorporation of kitchen waste, which was then covered with *kasgot* soil. The compost mixture was subsequently moistened with water and layered again with brown materials. Additional organic waste was then added, and the previous steps were repeated accordingly. The compost was stirred every two to three days, and after the decomposition process was completed, the compost was harvested and utilized as a planting medium. (Muharram et al., 2024).

By mastering the simple yet innovative OCTACO composting technology, residents are expected to become less dependent on external parties in managing their

waste. The compost produced can be directly utilized to fertilize crops, home gardens, and household yards, naturally improving soil fertility while simultaneously reducing expenditures on chemical fertilizers (Primarni et al., 2024).

Figure 3a and 3b. OCTACO compost production results and ceremonial handover to residents

Through the implementation of socialization activities and hands on practice, residents of Naluk Village gained a better understanding of the urgency of waste segregation as well as the techniques for processing organic waste into OCTACO compost. This program not only enhanced participants' knowledge but also strengthened their practical skills in utilizing household waste in a more value added manner. The observed impact included an increase in environmental awareness among community members, along with the expectation that these positive practices can be sustainably adopted in daily life. Thus, this KKN program aligns with its initial objective of fostering a clean, healthy, and productive environment through active community participation.

CONCLUSION

Overall, the implementation of waste segregation education and OCTACO compost production under the KKN program in Naluk Village demonstrated a positive contribution to enhancing community awareness, knowledge, and practical skills in sustainable household waste management. The combination of educational sessions and hands on practice effectively addressed the initial lack of understanding regarding waste classification and organic waste processing. The OCTACO composting method proved to be a practical, efficient, and community friendly innovation, enabling residents to transform household organic waste into valuable compost while reducing waste sent to temporary disposal sites. Moreover, this program supported community self reliance by promoting environmentally responsible behavior, reducing dependence on chemical

fertilizers, and encouraging the productive use of household waste. These outcomes indicate that participatory waste management initiatives such as this KKN program have strong potential to foster a cleaner, healthier, and more productive village environment when consistently adopted and further developed.

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