

**COMMUNITY ROLE IN WASTE MANAGEMENT:
A CRITICAL REVIEW**

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ABSTRACT:

The management of waste disposal is one of the most pressing environmental challenges of the modern world. While policies and technologies can provide the structural framework, it is community involvement that plays a crucial role in the success of waste management initiatives. This article explores how active community participation can improve waste disposal practices, emphasizing the importance of education, collective responsibility, and local engagement. The paper reviews key strategies that can be employed to foster a cooperative approach to waste management, highlighting successful examples and outlining the broader environmental and social benefits of community-driven waste disposal efforts. Increased waste production is one of the critical environmental problems worldwide. Optimizing waste management, especially community-based waste management, is considered an efficient solution in addressing this problem. This research uses a literature review approach, where data and information are collected from various sources including scientific journals, articles, research reports, and government documents relevant to community-based waste management. The results show that community involvement and active participation in waste management, environmental awareness education, and incentives are key factors in the success of community-based waste management. In addition, the role of the government is crucial in providing support in the form of favorable regulations, adequate infrastructure, and facilitation of collaboration between the community, government, and private sector. This study also found that the integration of technology in the waste management system contributes to improving the efficiency and effectiveness of the process.

KEYWORDS:

Management, Environmental, Emphasizing, Collaboration.

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INTRODUCTION:

Waste management is one of the crucial environmental issues faced by many countries in the world. The problem of waste is not only related to the volume that continues to increase along with population growth and community consumption, but also related to the management system that has not been optimized (Sari, 2022). Waste disposal is an essential aspect of urban and rural living, yet it remains a significant global challenge, particularly in densely populated areas. With increasing consumption, urbanization, and industrial activities, the volume of waste generated has escalated, placing enormous pressure on existing waste management systems. While governmental policies, technological advancements, and infrastructure development are vital for handling waste, the role of the community in waste disposal is equally crucial. Community involvement creates a sense of collective responsibility, encouraging individuals to take proactive steps toward reducing, recycling, and properly disposing of waste. The importance of conducting a literature review on optimizing community-based waste management sits on the need to identify and analyze various models and strategies that have been implemented, explore the successes and obstacles faced, and formulate recommendations that can be adopted by other communities in developing a better waste management system. This research is expected to provide new insights and directions in efforts to optimize waste management, so that it can contribute significantly to the solution of global waste problems.

OBJECTIVES OF THE STUDY:

- To study the application of technology in waste management.
- To study the community and government involvement in waste management.

RESEARCH METHOD: The research method used in this study is literature review. The literature review method is a systematic and comprehensive research approach in collecting, reviewing, and analyzing relevant publications for a particular topic or research question (Sio et al., 2024; Nguyen et al., 2024). This method is used to identify, understand, and draw conclusions from previous work that has been done in the same or related fields of study (Kim et al., 2024).

RESULT AND DISCUSSION: Waste Management Concept
Waste management is a process that includes waste collection,

transportation, treatment, and disposal. This process is not only focused on the management of waste and hazardous materials, but also includes resource management and environmental protection (Andayani et al., 2023). The goal is to reduce waste generation, increase recycling and recovery, and reduce negative impacts on the environment and human health (Puspitasari & Hidayat, 2022). Modern approaches to waste management involve practices such as waste reduction at source, waste segregation to facilitate recycling, and the use of technologies such as thermal processing and composting to convert waste into more useful forms (Andayani et al., 2023).

Community-Based Waste Management Community-Based Waste Management (CBWM) is an approach to waste management that prioritizes active community participation in every aspect of the process, from waste reduction at the source, segregation, collection, to waste processing and reuse (Wahyudi & Budiyanto, 2024). This approach emphasizes that an effective solution to the waste problem does not only depend on technical interventions or government policies alone, but also on behavioral changes and active participation from the community itself. By directly involving the community, CBWM aims to create a more sustainable waste management system, reduce environmental impacts, and increase community awareness and responsibility for their environment (Suryawan & Lee, 2023). The implementation model of Community-Based Waste Management (CBWM) varies across countries, tailored to the local context and needs. In developing countries such as Indonesia, a frequently implemented model is the “waste bank,” a system where people can exchange their segregated waste, especially inorganic waste such as plastic and metal, for money or goods (Phan et al., 2023). This initiative not only encourages waste segregation at source but also provides economic incentives to the community.

Application of Technology in Waste Management

The application of technology in waste management has been a revolutionary step that helps improve the efficiency of collection, sorting, and recycling processes. Technologies such as the Internet of Things (IoT) have enabled the creation of smart bins that can monitor waste levels in real-time, optimize waste collection routes, and even sort waste types automatically (Wahyudi & Budiyanto, 2024). For example, some cities have adopted waste bins equipped with sensors to notify waste management

officers when the bins are full, ensuring more efficient waste collection and reducing the possibility of waste overflowing onto the streets. In recycling, innovations such as the use of high-tech robots and artificial intelligence (AI) for waste sorting have great potential to increase the capacity and efficiency of recycling systems. These robots can work non-stop, sorting material types with much greater speed and accuracy than humans. Artificial intelligence can also analyze data from the waste management process to detect patterns and improve overall operations (Djuwendah et al., 2023). In addition, digital platforms and mobile applications have become vital tools to educate and engage the public in waste management activities, such as drop-off locations for recyclables and collection schedules.

Community and Government Involvement Community involvement is one of the crucial aspects in successful waste management. Continuous education and socialization to the community about the importance of good waste management can form positive habits in disposing of waste responsibly (Archip et al., 2023). Waste management programs that involve active community participation, such as waste management from the source (waste banks), household organic waste composting, and recycling programs, can preserve the environment while reducing the burden on landfills. Communities that are actively involved in waste management will feel ownership and responsibility for the cleanliness and sustainability of their environment. On the other hand, the government has an important role in providing infrastructure, regulations, and facilities that support community-based waste management efforts. Supportive policy schemes, such as incentives for individuals or community groups who are successful in waste management, as well as the establishment of recycling facilities that are easily accessible to the community, are needed to encourage active community participation (Phan et al., 2023).

Collaboration Between Government and Community Organizations:

Successful waste management requires a strong partnership between local authorities and community organizations. Governments can provide the necessary infrastructure, such as waste collection systems and recycling facilities, while community groups can play an essential role in advocating for responsible waste practices and mobilizing public participation. Community leaders can also assist in developing and implementing waste reduction policies that are tailored to local needs. For instance, in some

areas, community members have been instrumental in advocating for local bans on single-use plastic bags or the introduction of municipal composting programs. Additionally, local government support for these initiatives, including providing funding or materials, can amplify their success.

Conclusion

The implementation of a waste management strategy that involves the active participation of the community is the key to success in creating an effective and sustainable system. Based on the literature review, it is clear that community-based waste management not only optimizes the collection and recycling process, but also increases environmental awareness and responsibility in individuals. Programs such as composting of organic waste, waste bank system, and community cooperation in waste segregation have been proven to reduce the volume of waste disposed to landfills. Furthermore, these findings support the idea that government policies that support community-based waste management initiatives are crucial in ensuring the sustainability of these programs. The provision of incentives, whether in the form of financial or non-financial support, policies that favor community-based waste management practices, as well as the development of supportive infrastructure, are some of the steps that can be taken by the government to strengthen community participation.

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Conflict of interest:

The Authors have no conflict of interest to declare that they are relevant to the content of this article.

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