

Development of a Community-Centric Autonomous Waste Management System

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ABSTRACT

We need to tackle waste as a major problem systemically. A viable strategy to mitigate waste issues is the establishment of a community-based waste management system; however, its implementation necessitates the engagement of all stakeholders. This study aims to delineate the community empowerment initiatives implemented inside the Waste Thematic activities. The conducted activities encompass the socializing of waste sorting at each meeting, the revival of the waste shodaqoh system, the creation of bottle rubbish baskets, and the activation of group fish ponds. The results of this activity are the implementation of the socialization of waste sorting in each household, the implementation of the waste shodaqoh system initiated by youth, the procurement of bottle waste baskets in every corner of the village, and the activation of fish ponds by providing fish seeds as one of the means of meeting with the mandatory topic of sustainable waste education. We anticipate that the implementation in one of the homeowners' neighborhoods will serve as a model for other residents. The participation of all stakeholders is essential for the evolution of the established system into a self-sustaining trash community.

Keywords: Waste Management; Community; Waste Innovation

INTRODUCTION

Waste constitutes a significant issue in Indonesia. Indonesia possesses the second biggest volume of plastic garbage globally, following China. The escalation of trash will persist in tandem with the rate of population growth. An increase in activity correlates with a heightened risk for supplementary waste. Kapanewon Banguntapan is the largest garbage producer, generating 62.04 tons per day and accounting for around 12% of total waste output. It has

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committed to achieving zero waste by 2025. The head of the Environment Agency stated in his report that the implementation of zero waste-based waste management was conducted to assist the clean program (Handoyo et al., 2020). The efficacy of this initiative necessitates the participation of multiple stakeholders. The university endeavors to contribute by conducting a Waste Management Symposium. One of these events occurred in Padun.

Community-based trash management is the most efficacious strategy for mitigating the escalation of waste in landfills. Waste collection necessitates appropriate management contingent upon the number of stakeholders, categories, and operations involved. On-site waste management, or source waste handling, involves the treatment of garbage with remaining economic value prior to its arrival at the landfill. Managing a community's garbage is more efficient than the subsequent stage (Wijayanti & Suryani, 2015). The primary waste management action is to establish trash sorting practices, followed by waste utilization and recycling. Lee & Jung (2018) asserted that waste management aims to improve public health and environmental quality by converting waste into a valuable resource. Waste management in Bantul Regency implements the 3R concept: reuse, reduce, and recycle. The 3R approach promotes the management of garbage at its origin, including the sorting and proper packing of materials; hence, it fosters the implementation of waste utilization practices that possess economic value, from scavengers to the recycling industry. You can convert organic waste into compost, liquid organic fertilizer, biogas, bioethanol, and even a bioconversion treatment system. Bioconversion is a process that converts organic waste into methane by fermentation, utilizing anaerobic organisms such as fungi, bacteria, and larvae (Kain et al., 2022). This method can be implemented if each household practices effective waste sorting behavior. Research indicates that community empowerment is crucial for the effectiveness of trash management. Continuous socialization is essential to achieve this goal.

It requires ongoing social interaction. Each household segregates waste into three categories: plastic waste is directed to facilities that recycle plastics, paper waste is allocated to the paper processing sector, and organic waste is converted into compost. Padukuhan Circle is among the areas endeavoring to embrace this initiative favorably. As a standalone waste community, the current waste sorting procedure lacks adequate organization. This initiative requires the active participation of all community members, including the leaders of the padukuns and their subordinates, as well as youth, mothers, and fathers. Community empowerment in trash management to achieve a waste-independent village necessitates the involvement of multiple stakeholders. We anticipate that university students' participation will improve garbage management in Padukuhan Circle.

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RESEARCH ELABORATIONS

This journal employs a qualitative descriptive research strategy. We acquired the data through direct engagement with the target community, which includes women, Fish Group Leaders, youth, and other stakeholders involved in each activity. We conduct data collection and reduction to establish parameters that enhance the emphasis on the primary program, specifically waste management. Programs such as drug counseling, socialization of the ITE Law for adolescents, field painting, and other routine activities are absent. The process commences with program planning, preparation of activities, implementation, and evaluation. The primary informants and directors of the activity were Mr. Dukuh and Mrs. Dukuh, who delivered a descriptive presentation on thematic activities related to waste reduction. The process commences with planning, execution, and assessment.

RESULTS AND DISCUSSIONS

Community service aims to promote science, technology, and art throughout the community. These actions must generate more value for the community, encompassing economic initiatives, policy enhancements, and social behavioral modifications. Elucidate how service activities have facilitated transformations for individuals, communities, and institutions, encompassing both short-term and long-term effects. General conditions pertaining to trash management in Padukuhan Kalangan Community service activities focused on waste management are conducted in Padukuhan Kalangan. This graphic is a geographical map of Padukuhan. The waste management practices implemented in Padukun can be characterized as follows: Waste management has been in operation, although it is not functioning at its best. The neighborhood has deliberately implemented waste management at home by segregating trash types and producing organic fertilizer from organic household waste. Shodaqoh garbage, overseen by waste bank activists, is collected weekly. Residents have implemented community-based waste management, equipping each household with three garbage bins for waste segregation, and have engaged in organic waste management that generates fertilizer for gardens. We anticipate that all RTs in Padukuhan will serve as model towns for waste management for other regions in the future. All regular activities and gatherings, including those of fish groups, mothers, hamlets, and sodaqoh campaigners, consistently incorporate instruction and socialization about waste management to ensure inhabitants comprehend the significance of cultivating 3R practices.

The Padukuh meeting facilitated the socialization of the 3Rs in trash management. The Circle Village comprises 20 entities. 60 individuals, including 1 delegate and 2 representatives

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from Dasa Wisma, attended the program. We conducted an evaluation on all participants. Include inquiries and responses pertaining to waste management practices, particularly about garbage sorting behavior. Participants who pose inquiries and provide responses are awarded door prizes. The community's response to garbage sorting behavior can be categorized into three distinct groups. (a) Have executed 3R activities efficiently on a structured group basis. It possesses independent processing capabilities and has commenced the production of eco-enzymes. This has been implemented in (b); however, it has not been ideal. No proper categorization or processing facilitation has occurred. The execution has occurred, and comprehension has been achieved; yet, it remains confined to individual efforts without a strategy for systematic management, approximately 4T. At the end of the activity, we determined that collaboration-encouraging training would ensure its success. This document outlines socialization efforts pertaining to waste management practices involving the 3Rs: reduce, reuse, recycle.

We aim to simplify the collection of plastic bottle refuse in each locality by providing waste receptacles, expecting all residents to adapt to waste segregation. The presence of the garbage basket facilitates waste collection for shodaqoh campaigners. The primary participants in the trash sodaqoh initiative are adolescents. They collect the sorted waste from residences and subsequently sell it to subscription waste traders, who retrieve it at designated collection points. The town utilizes the outcomes to advance its social initiatives. Aquaculture initiatives provide education on sustainable waste management. We must continue to communicate the garbage education initiative, specifically about 3R practices, to the community. One initiative to promote sustainable waste management is the integration of waste management practices with aquaculture in ponds (SOESANTO et al., 2021). Every conference consistently focuses on waste education. We assign each member a schedule for pool maintenance. This matter pertains to the allocation of fish seeds to the aquaculture group. The reactivation of the fish group will institutionalize the waste education process as a regular program for this group.

Padukuhan Circle is categorized as having initiated waste management initiatives, however, without proper systematization. Certain communal experiences may serve as a benchmark to further the ongoing process. Successful initiatives include garbage management in Gowosari and the production of ecobricks. Furthermore, the participation of various entities, including the government, corporate sector, educational institutions, and other stakeholders, is essential for the gradual achievement of a waste-independent village in Padukuhan (Siame, 2018). We anticipate achieving the objective within the next two years. Therefore, we have outlined alternative tactics below for your consideration.

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CONCLUSIONS

The thematic activities conducted demonstrate success in motivating the community to initiate waste control efforts. This is evident in both tangible and intangible contributions. This initiative effectively established a sorting box for bottle garbage and fish seeds, serving as a tangible method for the community to manage waste and optimize resources. Furthermore, there was a notable increase in non-physical dimensions, particularly regarding changes in individuals' behavior. Ongoing waste education at each meeting has effectively enhanced awareness and the implementation of the 3R (reduce, reuse, recycle) principle, which is a crucial cornerstone of sustainable waste management.

This achievement places community 22 as a pioneer of a waste-independent community. Their success in building an independent waste management system is expected to be a model and reference for other communities in Padukuhan Kalangan. Thus, it is hoped that there will be a domino effect that encourages more regions to adopt similar self-sustaining waste management practices, contributing to a cleaner and more sustainable environment throughout the Circle Village.

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