



Empowerment of the Community in Optimizing Household Waste Management through the Takakura Method

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Abstract : This study aims to analyze and discuss the mentoring activities in optimizing household waste management using the Takakura method. The Takakura method is a community-based approach that has the potential to transform environmentally unfriendly waste management practices into a more sustainable and economically valuable system. The mentoring activities were conducted in the Banyuwangi region with the goal of reducing the amount of waste sent to the Final Disposal Site (TPA) and addressing harmful waste burning practices that impact the environment. The mentoring activities consisted of a series of training and socialization sessions for the community on household waste management using the Takakura method. The mentoring involved training in compost production, understanding the environmental and economic benefits of compost, and practical waste management techniques. The results of the mentoring showed an increased awareness among the community about the importance of proper household waste management. The practice of waste burning significantly decreased, reducing harmful emissions into the air. The increased production of compost also created new economic opportunities for the community. The mentoring for optimizing household waste management using the Takakura method has a positive impact on changing waste management practices and reducing negative environmental impacts. This method provides a solution that can be adopted on a larger scale to address waste-related issues in society.

Keywords : Community Development; Household; Waste Management.

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INTRODUCTION

Waste is one of the issues that must be addressed in society, as improper management can lead to environmental pollution. Waste is generated from human activities in households, and it can include leftover food consumed by the community. Proper waste management can bring benefits to humans and create significant entrepreneurial opportunities for the community. Entrepreneurial opportunities in this context can increase community income, foster creative industries, and develop the creative economy. In almost all human activities, waste is inevitably produced. If waste is not handled properly, it can lead to various environmental, health, social, and aesthetic problems, aside from causing pollution. Household waste refers to the waste generated from day-to-day activities within households, excluding specific waste types (Warjoto et al., 2018). A significant portion of kitchen activities can be a source of organic waste that can be turned into compost, giving the household waste added value and a better market value compared to its original materials. Compost is a human-made organic fertilizer produced through the decomposition process of organic materials (Wang & Santiago-Avilés, 2004).

Composting is seen as an appropriate solution to address waste issues due to its simplicity, cost-effectiveness, lack of pollution, and the valuable product (compost) it yields (Lv et al., 2014). Various efforts are being made to manage household waste, as proper management from the start can reduce waste accumulation, cut transportation costs, and ultimately extend the lifespan of landfill sites (Al-khadher et al., 2021). Conventional waste management practices have led to an increased demand for facilities and infrastructure, particularly land, which is becoming scarce. Therefore, waste management with the principle of disposing while deriving benefits from the process is necessary. The 3Rs of waste management consist of reducing waste accumulation (reduce), reusing materials (reused), and recycling (recycle). The application of the 3Rs, particularly composting, presents a significant opportunity, around 30-40%, and offers economic benefits to the community (Mundiri & Baharun, 2021). According to research by Subandrio et al. (2012), household organic waste composition is predominantly kitchen waste.

Advancements in science and technology have had a positive impact on economic development by yielding various products through existing technological processes. One such product is compost produced using the "Takakura" method (Jiménez-Antillón et al., 2018). Composting through this method can be conducted in small spaces, quickly, easily, and without producing odors (Nurdini, 2016). Takakura is a composting method with advantages that can be applied in limited spaces. Additionally, Takakura is easy to implement; organic waste, once chopped into small pieces, can be placed in a basket without the need for additional materials. Due to the fermentation process, Takakura doesn't emit odors (Yiang and Ibrahim, 2013). According to Widikusyanto et al. (2015), Takakura is suitable for household scale to reduce waste at its source.

As a manifestation of concern for waste management, action is necessary, beginning at the smallest scale - households. Until now, residents in Tamansari village have been disposing of their waste in rivers and burning it. Furthermore, most residents in Tamansari village lack information about kitchen waste management in households. Therefore, education, guidance, and research are required. Guiding the creation of compost from organic kitchen waste using the "Takakura" method can provide information and increase the economic value of organic kitchen waste by turning it into compost fertilizer (Dewilda et al., 2021). Waste management aims to improve community health, environmental quality, and transform waste into a resource (Marliani, 2014). This education initiative is expected to impart knowledge about composting organic waste using the "Takakura" method for wise, simple, affordable waste management, yielding compost products that can be further utilized (Kartini et al., 2021).

The locus of this empowerment activity is Tamansari Village that are village located in the Tegalsari sub-district, Banyuwangi Regency, East Java Province. The inhabitants of Tamansari Village primarily use the Javanese language. However, over time, there have been newcomers who stopped by and settled in Tamansari Village. Some of these newcomers are from the Madurese ethnic group due to the village's proximity to highlands and the availability of ample land for cultivation. As a result, these newcomers mainly engage in farming and agricultural labor. Geographically, Tamansari Village covers an area of 664.03 hectares with a population of approximately 8,928 people. The population is composed of 4,449 males and 4,479 females, distributed among 2,419 households.

Tamansari Village comprises two hamlets: Krajan Hamlet and Polean Hamlet. Both hamlets have historically faced various issues, notably waste management. Waste is one of the problems that must be addressed in society because improper management can lead to environmental pollution. Waste is generated from human activities within households, and it can include leftover food consumed by the community. Proper waste management can bring benefits to humans and create significant entrepreneurial opportunities for the community (Mappau & Islam, 2022). Entrepreneurial opportunities, in this context, can increase community income, foster creative industries, and develop the creative economy.

METHOD

In this community service, a strategy approach is used based on the principles of Asset-Based Community-Driven Development (ABCD). The key points to emphasize within the paradigm and principles of the ABCD approach are that everything revolves around understanding and internalizing assets, potential, strengths, and self-reliant and maximum utilization. Each principle signifies an awareness of the positive strengths and energies possessed by the community, which need to be identified, known, understood, internalized, and subsequently mobilized by the community itself, aiming towards

enhancing the well-being and empowerment of all community elements (UINSA Team, 2015).

This community service will employ a partnership approach, where partnership is a relationship formed among individuals or groups who recognize cooperation and shared responsibility in achieving specific goals. Within the ABCD principles, the community's ability to discover and recognize the assets, strengths, and potential they possess is seen as capable of driving and mobilizing them to enact change, while also acting as the primary agents of that change. This can be achieved using methods such; appreciative inquiry, community mapping, transect walks, and mapping. This community service involves the dissemination of information about the optimization of Household Waste for compost production using the Takakura method, conducted in Tamansari Village, Tegalsari Sub-district, Banyuwangi Regency.

To achieve the desired condition of guidance, steps are taken gradually. From these various stages, the Team assumes the role of a facilitator and a change agent to assist the subjects in recognizing and defining needs, diagnosing problems and relevant resource objectives, selecting or creating solutions, devising and utilizing solutions, and evaluating whether they meet the needs. Therefore, the model developed by the Team is a subject-empowering learning model. Based on the development of an empowerment-based learning model, the steps taken include; 1) Establishing communication and direct meetings with the subjects using this method. The Team conveys its purpose and goals, then extensively explores the geographical and demographic conditions of the village. It also gains an understanding of the village's issues. During this week, students gather information about the household's economic conditions, the community's religious profile, and data related to village development politics. In this approach phase, the Team, along with the subjects and the community, identifies common problems faced by the residents, including their expectations for the future. Through an exploratory approach, core and main problems can be discovered, leading to mapping out which issues are urgent to be addressed in formulating concepts and constructing models; 2) Program planning involves analyzing all the needs required by the residents of Tamansari hamlet. At this stage, a series of work programs are planned to accommodate the needs of the subjects, along with determining success indicators. When designing activity programs, the voice, aspirations, needs, experiences, and interests of the subjects become the foundation, facilitated by the Team; 3) The implementation of the activity programs is where the previously designed programs are executed according to the predetermined schedule. At this stage, funding issues need to be considered, leading the Team to seek funding and involve other stakeholders closely related to empowerment and awareness programs. Some stakeholders involved include the village head, health department, and the heads of RT in Tamansari hamlet. With this collaboration, the planned programs can be executed as intended; 4) The evaluation stage is crucial to measure and evaluate to what extent the program's

implementation aligns with the predetermined indicators, while also providing feedback for reflection, contemplation, and documentation to strengthen the program; 5) The endeavor is to understand the community's situation in Tamansari Village, specifically in Tamansari hamlet. During the first week, the Team integrates with the community, fostering cooperation that signifies a built trust between the Team and the community. In the first week, data about the geographical and demographic conditions of the village is collected, along with gaining an understanding of the village's issues. During this week, information about household economics, the community's religious profile, and village development political data is also acquired; 6) The effort is to comprehend the issues faced by the community in Andong Sari hamlet. The Team can also form a community activity calendar from the results of engaging with the community. The Team can create a problem tree and hope tree chart from the observation with the community. During the second week, students begin holding meetings with the youth of Andong Sari hamlet, discussing activities for clean-up weeks and August competitions; 7) The problem-solving plan for environmental cleanliness in Tamansari hamlet is already established. The plan includes forming an active youth group engaged in community activities, implementing a clean-up week program; installing banners prohibiting littering in rice fields and river streams; gathering village heads, RT, RW, and community figures, and organizing a campaign on environmental cleanliness and adopting clean living behaviors in Tamansari. In the fourth week, activities related to environmental cleanliness have been carried out and evaluated. Researchers have also identified challenges and solutions related to environmental cleanliness activities.

RESULT AND DISCUSSION

To realize the program optimization of household waste processing using the takakura method in tamansari village, the Researcher begins by conducting observations within the households of Tamansari village and socializing the program to neighboring mothers, the local community, the PKK (Family Welfare Movement) mothers, and Female Cadre Mothers. It was found that the absence of village land designated for public facilities has led to the lack of a final disposal site for waste. This aligns with the profile of Padang Village in the year 2020. The absence of a Waste Disposal Site (TPS) causes residents to dispose of waste indiscriminately, such as in agricultural fields and river streams.

Based on the Researcher's observations and interviews with the Head of RT (neighborhood unit leader), Community Leaders, and PKK mothers during a gathering, they mentioned that there is a substantial amount of household waste, but it hasn't been managed properly. This is due to the lack of knowledge on how to manage household waste and convert it into organic compost. Besides catering to the community's needs, understanding how household waste can enhance economic value is crucial. Therefore, it's

important for the community to receive education on how to manage household waste and turn it into something with marketable value.

The impacts of the changes brought about by this activity are as follows; 1) Improved Bolding's capabilities, including the provision of skills in managing both organic and inorganic domestic waste, thereby creating economic value for the local community; 2) Behavioral changes in waste disposal, including sorting, and increased awareness and attention towards a clean and healthy environment as a shared responsibility, and; 3) Growth of residents' creativity in managing and utilizing household waste by transforming it into organic compost, thereby adding economic value and potentially enhancing community well-being.

The Republic of Indonesia Law Number 18 of 2008 concerning Waste Management defines waste as the residue of human daily activities and/or natural processes in solid form. Every human activity generates waste. The new paradigm in waste management applies a holistic approach from upstream to downstream waste management (Mappau & Islam, 2022). The Indonesian Government Regulation Number 81 of 2012 regarding Household Waste and Similar Waste Management describes household waste as waste originating from daily household activities, excluding feces and specific waste. Waste management is a systematic, comprehensive, and continuous activity that includes waste reduction and handling. Waste management programs are designed to reduce environmental and health effects caused by waste accumulation in the community environment.

Banyuwangi city generates a significant amount of waste on a daily basis, with 880 tons per day in 2017 and reaching 1,000 tons per day in 2018. The highest waste composition includes organic waste at 43.39%, inorganic waste at 26.52%, hazardous waste at 14.45%, and other waste at 15.64% (DLH Banyuwangi City, 2018). This presents a significant challenge currently faced by South Banyuwangi. Therefore, a strategy is necessary to address the organic waste issue, aiming to minimize the amount of waste sent to the Final Disposal Site, in line with waste management policies in urban areas as outlined in Law No. 18 of 2008 on Waste Management.

Based on the initial observations conducted in 2020 in the Banyuwangi area, it was found that 50% of waste management is done through burning. This is a particular concern due to inadequate and environmentally unsafe waste management practices. According to Asriati's research (2012), individuals living close to specific burning sources and exposed to hazardous smoke concentrations have a higher risk of respiratory diseases such as pneumonia and acute respiratory infections (ISPA). Burning waste can lead to smoke containing particles that enter the respiratory tract, influencing the occurrence of ISPA.

Based on these observations, community empowerment is needed to motivate the Banyuwangi community to manage household waste effectively, minimizing waste generation and burning activities in residential areas to reduce environmental and health

impacts caused by waste burning and waste accumulation. The researcher conducted community engagement through composting training using the Takakura method within the Banyuwangi city community, serving as a pilot area for organic waste management in South Banyuwangi. This initiative aims to reduce waste generation and counteract poor waste management practices such as burning. Based on Kurniawan's research (2013), it is known that Surabaya City successfully reduced waste generation by 30% through composting using the Takakura method, distributing over 40,000 Takakura containers and around 900 composts to the local community. This involved 400 environmental facilitators and 28,000 environmental cadres.

Assistance activities in optimizing household waste management using the Takakura method are an effort to transform environmentally unfriendly waste management practices into more sustainable and economically valuable systems. This section delves into a comprehensive discussion of the impacts resulting from these assistance activities. One of the positive impacts arising from these assistance activities is the heightened awareness of the importance of proper household waste management among the community. Through socialization and training, the community comprehends the negative consequences of waste burning and the benefits of converting organic waste into compost. This awareness drives behavioral changes in waste management, reduces burning practices, and initiates composting practices.

During the assistance activities, community members are engaged in various educational and training sessions. These sessions are designed to inform them about the adverse effects of improper waste disposal, particularly waste burning, and the benefits of adopting sustainable waste management practices. This educational approach includes highlighting the environmental, health, and economic repercussions of prevalent waste management practices. Through these sessions, community members gain a clearer understanding of how waste burning contributes to air pollution, releases harmful toxins, and negatively impacts air quality. Additionally, they learn about the potential health risks associated with such practices, as well as the implications for the overall ecosystem. Armed with this knowledge, community members are more motivated to change their behavior. Moreover, the educational efforts emphasize the economic potential of properly managing waste. Community members learn that through the Takakura method, organic waste can be transformed into valuable compost that can be used to enrich soil quality, thus improving agricultural productivity. This information helps individuals recognize that waste is not just a burden but can also be a resource if managed correctly. The increased public awareness translates into tangible behavioral shifts within the community. Members become more conscious of segregating their waste, specifically diverting organic waste for composting. They begin to comprehend the overall impact their waste management decisions have on the environment, their health, and the community's well-being. One of the most significant

achievements of increased public awareness is that it goes beyond the period of assistance. As community members realize the importance of proper waste management, they become advocates and influencers within their own social circles. They share their knowledge and experiences, creating a ripple effect that spreads sustainable waste management practices throughout the community. The increased public awareness resulting from assistance activities in optimizing household waste management using the Takakura method is a transformative impact. By enlightening community members about the environmental, health, and economic implications of their waste management choices, the assistance not only triggers immediate behavior change but also establishes a foundation for long-term sustainability and empowerment within the community.

Waste burning practices have led to hazardous emissions into the air, damaging air quality and jeopardizing public health (Dewilda et al., 2021). A significant impact of change is the drastic reduction in waste burning practices following the assistance. This results in the decrease of harmful emissions into the air, subsequently having a positive impact on public health and the environment. The Takakura method allows for the conversion of organic waste into economically valuable compost. The results of the assistance show an increase in compost production by the community. The positive impact is the creation of new economic opportunities for the community. The produced compost can be used by the community or sold to enhance income.

One of the significant positive outcomes of the assistance activities aimed at optimizing household waste management using the Takakura method is the reduction of harmful emissions, particularly those resulting from the practice of waste burning. This reduction has far-reaching effects on both the environment and public health. Waste burning is a common and harmful practice in many communities, leading to the emission of dangerous pollutants into the air. These emissions include greenhouse gases, particulate matter, volatile organic compounds, and other toxins. The burning of plastic and other non-biodegradable materials releases toxic fumes that can have severe respiratory and cardiovascular effects on both humans and animals.

By implementing the Takakura method and discouraging waste burning, communities experience immediate health benefits (Roslan et al., 2021). The reduction in harmful emissions means that residents are exposed to fewer toxic substances in the air they breathe. This leads to lower rates of respiratory illnesses, allergies, and other health conditions associated with poor air quality. In addition to its impact on public health, the reduction of harmful emissions contributes to preventing environmental degradation. Harmful emissions released through waste burning can contribute to the formation of smog and acid rain, further damaging air and water quality. By avoiding waste burning, communities can contribute to preserving local ecosystems and safeguarding water bodies.

As communities observe the positive effects of reduced harmful emissions on their health and environment, they become more committed to sustainable waste management

practices. This creates a feedback loop: the more individuals engage in proper waste management, the fewer emissions are released, leading to an overall improvement in air quality and a healthier environment. The reduction of harmful emissions also has long-term benefits. Improved air quality translates to reduced healthcare costs for the community, as fewer cases of respiratory illnesses require medical treatment. Additionally, a healthier environment enhances the overall quality of life and contributes to a more vibrant and sustainable community. On a broader scale, reducing harmful emissions aligns with global environmental goals, such as the reduction of greenhouse gas emissions to mitigate climate change. By minimizing the release of pollutants from waste burning, communities play a role in global efforts to combat climate change and protect the planet's overall well-being.

The reduction of harmful emissions resulting from the adoption of the Takakura method in household waste management is a crucial impact. This reduction benefits both public health and the environment by improving air quality, preventing environmental degradation, and contributing to global sustainability goals (Ugwu et al., 2021). It underscores the vital role that localized waste management practices can play in creating a cleaner, healthier, and more sustainable world.

These assistance activities encourage a shift in household waste management patterns. Communities become more conscious of the importance of waste segregation and composting organic waste. This alteration leads to the reduction of waste sent to Final Disposal Sites (TPA), decreasing negative environmental impacts, and enhancing the utilization of waste as compost. The impact of behavioral and waste management practice changes also yields positive environmental consequences overall. Reduced waste burning lessens toxic gas emissions and air pollution. The utilization of compost derived from organic waste diminishes the use of chemical fertilizers that can contaminate soil and water.

Assistance activities in optimizing household waste management using the Takakura method have a significant impact on altering waste management practices, enhancing community awareness, reducing waste burning practices, boosting compost production, and yielding positive environmental effects. This assistance offers a tangible example of how participatory approaches can generate positive changes in household waste management, aiding in creating a cleaner, healthier, and more sustainable environment.

CONCLUSION

The endeavor to optimize household waste management using the Takakura method through assistance activities has yielded impactful findings that emphasize the significance of transitioning from environmentally unfriendly waste management practices to more sustainable and economically valuable systems. The culmination of this initiative underscores the transformative potential of participatory approaches in fostering positive changes within waste management. The following are the key conclusions drawn from the outcomes of the assistance activities aimed at optimizing household waste management

using the Takakura method are enhanced public awareness, reduction of harmful emissions, increase in compost production, shift in waste management patterns, and positive environmental impacts.

The intervention's most significant achievement lies in the heightened awareness among the community about the critical importance of proper household waste management. Through knowledge dissemination and training, community members comprehend the detrimental effects of waste burning and the advantages of converting organic waste into compost. This heightened awareness triggers a shift in waste management behavior, reducing the prevalence of burning practices and encouraging composting; 2) Reduction of Harmful Emissions. Waste burning practices emit harmful substances into the air, compromising air quality and public health. Notably, the assistance activities have led to a substantial reduction in waste burning practices. This decrease translates into a lowered emission of hazardous substances into the atmosphere, thereby positively impacting public health and the environment.

The Takakura method allows the conversion of organic waste into economically valuable compost. The assistance activities have resulted in an augmented production of compost by the community, opening new economic opportunities. This production can be utilized within the community or sold to generate additional income. The assistance activities have instigated a change in the way communities manage their waste, including a reduction in waste sent to Final Disposal Sites (TPA), minimized negative environmental impacts, and a more effective utilization of waste through composting. Community members become more conscious of segregating waste and composting organic matter. The changes in waste management practices have generated positive environmental outcomes. Reduced waste burning decreases toxic emissions and air pollution, while the utilization of compost derived from organic waste diminishes the need for chemical fertilizers that can contaminate soil and water.

In conclusion, the assistance activities aimed at optimizing household waste management using the Takakura method have resulted in significant impacts that span heightened awareness, reduced harmful emissions, increased compost production, altered waste management practices, and positive environmental effects. This assistance initiative serves as a tangible illustration of how participatory methods can drive positive shifts in waste management behaviors, ultimately contributing to a cleaner, healthier, and more sustainable environment.

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