
The Utilization of Waste Waste as a Valuable Product for the Residents of Plumbon Village

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Abstract:

Waste and its processing are now an increasingly urgent problem in major cities throughout Indonesia – including Cirebon City, with a large area topography surrounded by riverbanks. The problem of waste in rural areas, in particular, has also begun to be seen as a large accumulation of waste in rural areas, especially the Sipelem Block, Plumbon Village, Cirebon Regency. This is due to the lack of awareness of the community on the one hand, and on the other hand, the operational techniques or waste processing and institutions are not optimal. Similarly, the participation of the community, especially the village government, is also still low or less supportive of these activities. This study intends to evaluate waste management in the area of Plumbon Village, Plumbon District, Cirebon Regency, namely to find out how the community in waste management in the area, and efforts to optimize the management of waste abundance that is useful and provide a levy for the residents of the village.

The research method used is qualitative descriptive, with an ABCD (asset-based community development) approach, especially in handling rural waste abundance. This study was conducted ABCD analysis to find out the problems in the research area. As a result of this study, it can be described that the improvement of waste management operations in Plumbon Village, both from waste transportation, the number of garbage transport fleets, and placing garbage bins in the Hamlet/Sipelem Block area is in the open field in the environment. The application of family waste treatment is managed with the 3R (Reduce, Reuse, Recycle) principle, which starts from the source, both household/group. Then, it is collected at the Waste Bank and/or Non-Governmental Group (KSM) Caring for Waste in the Village by burning waste waste to produce compost. And the process carried out by KSM Peduli Sampah residents also seeks to develop useful waste production, especially in increasing public awareness of the importance of family waste management as well as creating welfare for managing residents, and creating a clean environment due to properly and correctly managed waste management.

INTRODUCTION

Waste management is one of the biggest environmental challenges facing modern civilization today. Rapid population growth accompanied by changes in people's consumption patterns is directly proportional to the surge in the volume of daily waste generation. Juridically, Law Number 18 of 2008 concerning Waste Management has mandated that waste management must be carried out in an integrated manner through a reduction approach and waste handling (reuse, recycle). However, the paradigm of the majority of people is still stuck in the conventional method of gathering-transport-disposal, so that the burden of the national Final Disposal Site (TPA) is now at an alarming critical threshold. The condition of this waste emergency is reflected in the regional level, especially Cirebon Regency. Based on data from the Cirebon Regency Environment Agency (DLH), the total waste production in this area has exceeded 1,200 tons per day. Ironically, due to limited supporting facilities, limited operational budgets, and damage to the transport truck fleet, the local government is only able to manage less than half of the capacity, which is around 450 tons per day. This governance inequality has caused a shrinking of legal disposal space, leaving 750 tons of waste every day unhandled and leading to illegal waste disposal points in various public facilities of the community.

The problem of garbage accumulation is getting worse in the Plumbon District area, which is known as one of the centers of economic centers, creative industries, and dense settlements in Cirebon Regency. In Plumbon Village itself, the accumulation of domestic waste, both household organic and inorganic packaging waste, has filled the shoulder of the main road such as on Jalan Pangeran Antasari and surrounding residential areas. Garbage that is allowed to accumulate on the roadsides and riverbanks not only damages the aesthetics of the village, but has also triggered a strong odor, air pollution due to unilateral burning, and increased the risk of spreading infectious disease vectors. The low collective awareness of the community to sort waste from its source, coupled with the lack of education about recycling technology, makes valuable waste wasted without special handling. In fact, if managed through a circular economy approach, the waste can be transformed from an environmental burden into a productive economic asset. Organic waste can be processed using appropriate technology to become bulk compost, liquid organic fertilizer, and alternative feed through BSF maggot cultivation. On the other hand, inorganic waste such as flexible plastics can be diverted into handicraft products with artistic value, ecobrick blends, or channeled through structured waste bank management. This processing innovation not only significantly reduces the volume of waste residue sent to landfills, but also stimulates the emergence of new environment-based micro-business units that are able to provide additional direct financial income for local villagers.

The urgency of implementing community service programs in Plumbon Village is currently at a crucial point that cannot be postponed any longer. From an environmental and health aspect, leaving piles of garbage has the risk of triggering severe sanitation crises and flood disasters due to blockages in residents' irrigation canals. From a socio-economic aspect, this program offers productive solutions to empower local community groups, such as PKK and Karang Taruna, to become financially independent through waste utilization. In addition, this service step is also a real action in supporting the acceleration of the Decree of the Regent of Cirebon Number: 600.4.15/Kep. 83-DLH/2025 concerning the Roadmap for the Acceleration of Waste Management Completion to realize a waste-independent village. Therefore, the Community Service Team initiated a program entitled "Utilization of Waste Waste into Useful Products for Plumbon Village Residents". This program is designed not just as a momentary theoretical counseling, but a form of technology transfer and continuous assistance that is applicable. Through this program, it is hoped that there will be a fundamental change in mindset among the people of Plumbon Village, namely from the old paradigm of "just throwing garbage" to a new paradigm of "harvesting blessings" from wise waste management.

Based on the analysis of the situation in the background above, the formulation of the problem in this community service program is as follows: 1. How to increase the understanding and awareness of the residents of Plumbon Village regarding the importance of waste sorting from the source (household)? 2. How to apply appropriate technology in processing organic and inorganic waste into products with useful value in Plumbon Village? 3. What is the strategy to build sustainable waste management that is able to contribute economically to the residents of Plumbon Village?

Objectives of Community Service In line with the formulation of the problems faced, the objectives to be achieved from the implementation of this community service program are 1. Increase the concern, knowledge, and skills of the residents of Plumbon Village in sorting waste based on its type independently. 2. Transfer appropriate technology to the community to process organic waste into alternative fertilizers/feeds and inorganic waste into creative products with selling value. 3. Forming and assisting local waste management groups (such as Waste Banks or environment-based business units) to create a sustainable circular economy turnover.

The implementation of this community service program is expected to provide wide benefits for various parties, including: For the residents of Plumbon Village, the community gains a new understanding of healthy environmental governance, is free from the threat of waste pollution in public facilities, and obtains additional income opportunities from the sale of processed waste products. For the Plumbon Village Government, it helps the village in reducing the volume of waste residues disposed of into the environment, saves the cleanliness budget, and supports the realization of the waste independent village program that is in line with the policies of the Cirebon Regency Government. For the Service Team (Higher Education) It is a means of applying

the Tri Dharma of Higher Education in the aspect of community service, as well as testing the appropriate technology ecosystem for waste recycling directly on real social dynamics of the community.

METHODS

This community service program was carried out in Plumbon Village, Plumbon District, Cirebon Regency. The selection of this location was based on the urgency of the accumulation of domestic waste that was not properly managed along the main roads and public facilities of the village. The entire series of activities is planned to take place intensively for six months, which includes the preparation stage, socialization, technical training, group mentoring, and periodic monitoring. The target audience of strategic targets involved in this program is 30 to 40 active participants. Participants consisted of administrators and members of the Plumbon Village PKK Cadre as the driving force for household-scale waste sorting, members of Karang Taruna as processing technology operators, as well as representatives of village officials and local community leaders. The implementation of this program begins with the preparation and institutional coordination stage in the first month.

The service team held an official audience with the Head of Plumbon Village and his staff to harmonize the schedule of activities and technical licensing of the implementation site. At the same time, field observations were carried out to map the main waste accumulation points and identify the dominant types of waste that have the potential to become product raw materials. This stage ended with the procurement of operational support equipment, such as the installation of composter barrels, EM4 decomposing activator liquids, garbage scales, and personal protective equipment in the form of masks and medical gloves to maintain the hygiene of residents during activities. Entering the second month, the activity is focused on the socialization and education stage of mass waste sorting. The team provided interactive counseling on the dangers of burning waste openly, an introduction to waste regulations in Cirebon Regency, and an introduction to the concept of a profitable circular economy.

Residents were then guided directly through a mini-workshop to practice how to separate waste from the home kitchen into three main categories, namely organic waste, food waste, commercial inorganic waste that has a selling value, and hazardous residual waste. This correct sorting at the household level is the main foundation for the success of waste processing in the next stage. In the third to fourth months, the program continues with the training and transfer stages of appropriate technology. Residents are trained to process household organic waste and dry leaves using a simple composting method to produce fertile solid and liquid organic fertilizer. At the same time, Karang Taruna youth are equipped with special skills to process flexible plastic waste and packaging bottles into high-value handicraft products or ecobrick modules as village garden furniture materials. The self-production simulation was applied repeatedly for

the past two months to ensure that residents are accustomed to and able to maintain the standardization of the quality of processed products produced.

Furthermore, in the fifth month, the stage of business management assistance and strengthening local institutions was carried out to maintain the sustainability of the program. The service team initiated the formation of the management structure of the Plumbon Village Waste Bank which was managed collaboratively by PKK cadres and youth of Karang Taruna. This new management group was then given simple financial management training in the form of a waste savings system, fertilizer product packaging techniques, and digital marketing strategies so that the processed waste can be absorbed by the local agricultural market or used for the village's internal greening program. This series of community service was closed in the sixth month through a thorough monitoring and evaluation stage.

The evaluation was carried out using cognitive and psychomotor ability test instruments through assessment sheets before and after training to measure the level of knowledge absorption by residents. In addition, an evaluation of the real impact in the field was also carried out in the form of calculating the volume of waste reduction that was successfully suppressed so as not to pollute village roads, as well as recording the economic value or financial turnover that was successfully recorded by the newly fostered Waste Bank unit as concrete evidence of the success of the program.

RESULTS AND DISCUSSION

The implementation of the community service program in Plumbon Village, Plumbon District, Cirebon Regency, has been successfully implemented through a participatory approach involving PKK cadres, youth of Karang Taruna, and village officials. The activity began with the socialization and education phase of waste sorting which was attended by 35 active participants. Based on the results of the initial evaluation using the pre-test instrument, it is known that the priority of residents' understanding of waste sorting from the source is only 30%. The main factor in this low number is due to the absence of sorting facilities and the general assumption that waste is worthless waste. However, after interactive counseling on Cirebon Regency regulations and the concept of the circular economy, the post-test results showed a very significant surge in understanding up to 85%. Residents now understand the importance of separating kitchen organic waste from packaged inorganic waste before it is disposed of in a storage container. The next crucial phase is the transfer of appropriate technology that focuses on the treatment of the two dominant types of waste in Plumbon Village.

Through intensive training, the PKK women's group successfully practiced making solid organic fertilizer and liquid organic fertilizer using a composter barrel installation that utilizes EM4 activators. Household organic waste in the form of leftover vegetables and fruits that usually cause a strong smell on Jalan Pangeran Antasari, has now been successfully diverted into plant fertilizer products. On the other hand, Karang Taruna youth were given mechanical briefings to process inorganic waste in the form of

plastic bottles and flexible sachet packaging into ecobrick modules. This innovation not only isolates plastic waste so that it does not pollute the soil, but also succeeds in producing creative materials that are now used as benches and decorative tables in the garden area of the Plumbon Village Hall. The sustainability indicator of this program is marked by the formation of a new local institution called the Plumbon Mandiri Waste Bank. This group is managed collaboratively by PKK cadres as savings recorders and Karang Taruna as processing and logistics operators.

Through simple financial management assistance, this Waste Bank has successfully implemented the "Waste into Savings" system, where residents who deposit sorted inorganic waste will get a nominal value of rupiah in their savings account book. This step to strengthen local institutions has proven to be effective in changing the perspective of the community from what originally considered waste management as a burden, now to an economic activity that generates direct financial blessings for households. In the final stage of service, the evaluation of environmental and economic impacts shows very positive and measurable numbers. During the active mentoring period, this program succeeded in reducing the volume of domestic waste generation in Plumbon Village by 40% of the total estimated daily waste that usually accumulates illegally on the shoulder of the road. Economically, the Mandiri Plumbon Waste Bank unit has managed to record sales turnover of commercial compost fertilizers and the distribution of recycled raw materials to large collectors. This success proves that the service program not only successfully solves environmental sanitation problems independently, but also successfully implements a roadmap for accelerating regional waste settlement to realize circular economy resilience at the rural level.

CONCLUSION

The implementation of the community service program regarding the use of waste into valuable products in Plumbon Village can be concluded to have run very successfully and achieved the planned target. This program intervention has succeeded in radically changing people's mindset from a collect-transport-throw paradigm to a productive circular economy paradigm. This success is evidenced by the surge in residents' understanding of sorting waste from thirty percent to eighty-five percent based on the results of the final evaluation. In addition, the transfer of appropriate technology has succeeded in realizing real products in the form of organic fertilizers from domestic waste and creative furniture modules assisted by plastic recycling techniques.

The establishment of the Mandiri Plumbon Waste Bank institution is also concrete evidence of the existence of a new economic independence that is able to reduce up to forty percent of the generation of illegal waste while providing direct financial incentives for the savings of villagers. Although the program has had a significant positive impact on the environment and the local economy, long-term sustainability still requires special attention from various stakeholders. Therefore, it is

recommended to the Plumbon Village Government to prepare village-level regulations such as village regulations on independent waste management to strengthen the operational legality of the Waste Bank that has been formed.

The village is also expected to allocate part of the village funds for the expansion of sorting warehouse facilities and the procurement of mechanical waste shredding equipment to increase fertilizer production capacity. Finally, for the next service team or partner academics, it is recommended to carry out follow-up assistance that focuses on digitizing the mobile application-based waste savings system and expanding the downstream industry market network so that handicraft products processed by villagers have a much wider marketing reach.

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