

Optimizing Waste Management to Increase Community Awareness in Arjosari Sub-village, Ampelgading-Tirtoyudo

Joko Wibowo¹, Hairul Puadi

Universitas Al-Qolam, Malang, Indonesia

¹ jokowibowo@alqolam.ac.id (*correspondence author*)

Abstract

Waste management is one of the environmental problems often faced by marginalized communities. This activity is a research-based activity intended to increase awareness of community participation-based waste management in Arjosari Village, Tirtoyudo. The method used is PAR or participatory action research which seeks to strengthen the role and participation of the community in every line of the change movement. The waste management program in Arjosari Village is based on the inadequacy of waste management in the village. Not only that, there are many illegal waste dumps that can pollute the environment due to public awareness about the importance of protecting natural ecosystems. We have implemented programs to overcome this in several waste management projects, namely establishing a waste sorting system, producing compost and eco-enzyme products from organic waste. These projects involve the direct participation and role of the entire community.

Keywords: *community engagement; awareness; waste management; villagers; eco living*

Abstrak

Manajemen sampah merupakan salah satu masalah lingkungan yang kerap dihadapi oleh masyarakat pinggiran. Kegiatan ini merupakan kegiatan berbasis riset yang dimaksudkan untuk meningkatkan kesadaran akan manajemen sampah berbasis partisipasi masyarakat di Desa Arjosari, Tirtoyudo. Metode yang digunakan adalah PAR atau *participatory action research* yang berupaya untuk menguatkan peran dan partisipasi komunitas dalam setiap lini gerakan perubahannya. Program pengelolaan sampah di Desa Arjosari didasarkan pada ketidaklayakan manajemen sampah di desa tersebut. Tidak hanya itu, terdapat banyak sekali tempat pembuangan sampah yang ilegal dan dapat mencemari lingkungan yang disebabkan oleh kesadaran masyarakat perihal pentingnya menjaga ekosistem alam. Program untuk menanggulangi hal ini kami adakan dalam beberapa proyek pengelolaan sampah, yakni mendirikan sistem pemilahan sampah, produksi kompos dan produk eco-enzim dari sampah organik. Proyek-proyek tersebut melibatkan partisipasi dan peran seluruh masyarakat secara langsung.

Kata kunci: *pengabdian kepada masyarakat; kesadaran; pengelolaan sampah; masyarakat desa; eco-living*

1. INTRODUCTION

Community service or Pengabdian Kepada Masyarakat is one of the activities held to solve issues the community faces. This activity has a positive impact as it can set the community free from various disturbances, backwardness, and setbacks (Irwanto, 2021).

The Community service team held the program of Pengabdian Kepada Masyarakat in Arjosari Sub-village, Ampelgading Village, Tirtoyudo District, Malang Regency, in 2023. Arjosari Sub-village is a rural area where the majority of the land is used for agriculture. However, the Sub-village faced massive issues of waste management recently.

Based on the survey conducted by the team, the waste management issues in Arjosari Sub-village were caused by several factors. Firstly, there was a lack of designated waste disposal sites. Secondly, there was a lack of awareness and concern among the community regarding environmental issues. This has led many residents to manage waste improperly, such as by burning it or disposing of it indiscriminately (Godfrey et al., 2019).

Improper waste management can lead to various environmental problems, such as air, soil, and water pollution, as well as other forms of environmental degradation. The short-term effects experienced by residents due to inadequate waste management include respiratory tract infections (Abubakar et al., 2022) Therefore, the team decided to focus on a waste management program in Arjosari Sub-village.

This Community Service Program aimed to raise awareness of the Arjosari residents related to waste management, so that could promote environmental conservation in the Sub-village. The team assisted the community in the management of waste; the establishment of management systems and infrastructure and enhancing public awareness.

In its implementation, this program implemented the concept of Participatory Action Research based on Maqashid as-Syari'ah applied by Al-Qolam University. This concept relates to Ri'ayah al-Din, Ri'ayah al-'Aql, Ri'ayah an-Nafs, Ri'ayah al-Maal, Ri'ayah al-'Ird, and Ri'ayah al-Bi'ah. Thus, this program was not only focusing on environmental aspects but also paying attention to other aspects related to community life

2. METHODS

The research implemented the Participatory Action Research method with a participatory approach. The method applied a qualitative approach by studying, analyzing, and observing phenomena, then summarizing and collecting valid data to be analyzed into factual issues that must be resolved in a participatory manner.

This Participatory Action Research comprised several steps; the first was Preliminary Mapping. This was a phase where re-observation was carried out to ensure the priority issue was the priority program to be resolved. The re-observation was done by collecting and analyzing the data, the second was Social Preparation. In this phase, mapping and approaching the community and stakeholders were carried out through community service to obtain a comprehensive picture of the real issues experienced by the community, the third was Social Integration. This was a phase for sharing with the community of Arjosari Sub-village and

conducting Forum Group Discussions with the stakeholders. It was to explain the existing environmental issues of the Sub-village and jointly find solutions that were truly beneficial or Maslahah for the local community.

After carrying out the previous phases, a problem tree, a hope tree, and a logical framework for the service program (Logical Framework Analysis/LFA) were composed. In this logical framework, there are three main outcomes to be achieved, namely, a well-managed temporary disposal site, a community habit of disposing of trash properly, and a good waste sorting system

In achieving these three outcomes, several outputs and activities were planned, such as building a well-managed temporary disposal site, socialization and training on waste management, installing No-Littering-Warning Signs, and establishing a waste bank. In each activity, there are stages of coordination with village officials and stakeholders, program presentation, community consultation, reports and evaluations, and documentation.

All steps or stages of the implementation of community service were carried out in a participatory manner by actively involving the community and stakeholders. This was done to match the needs and conditions of the local community as well as build a sense of ownership and sustainability of the program after the community service program concluded.

3. RESULT AND DISCUSSION

Before the program was conducted, waste management in Arjosari Sub-village was still inadequate. This was marked by many illegal waste disposals spots, such as in the area around schools and rivers. These phenomena occurred due to several factors. Firstly, there was a lack of adequate waste management facilities. In Arjosari Sub-village, there were no waste disposal facilities such as trash bins or well-organized landfill sites. This caused people to litter, including in school areas and rivers.

The same thing happened in Montserrado County' Monrovia, Liberia. The civil war that had raged in Liberia for years had resulted in severe damage to infrastructure, including waste management facilities. Many landfill sites and waste transportation systems were damaged by the conflict. After the war ended, the population in Liberia increased significantly due to refugees returning to the country and a high birth rate. However, the Liberian government faced great challenges in rebuilding the damaged infrastructure, including the waste management system, due to budget and resource constraints. Rapid population growth was unbalanced by an increase in inadequate waste management facilities, such as temporary disposal sites, waste transportation fleets, and well-managed landfill areas. As a result, many communities had no other option but to litter into rivers, gutters, or vacant lots due to the unavailability of proper disposal sites (Kartakpah & Baysen, 2022).

The Service Community Team established a waste bank in Arjosari Sub-village to solve the issues. This waste bank served as a place to collect and sort waste so that people could easily separate organic and inorganic waste. In addition, the waste bank was also a means of educating the community about the importance of sorting waste.



Figure 1. The establishment

Secondly, there were low levels of education and environmental awareness. The low levels of education, where only 26% of Arjosari residents graduated from high school, could be a factor that triggered a lack of environmental awareness and education, especially regarding the negative impact of littering. People with low education levels tend to have limited access to information and education on the importance of good waste management. Formal education usually includes a curriculum that teaches about the environment, health, and waste management. Formal education helps individuals understand complex concepts such as ecosystem cycles, the impact of pollution, and ways of sustainable waste management. Without this understanding and knowledge, environmental awareness and motivation to practice good waste management tend to be low.

A similar picture occurred in Palangkaraya, where the accumulation of waste posed environmental issues stemming from the community's lack of understanding of waste management practices. This phenomenon occurred along the road of Kreng Kreng Bangkirai in Palangkaraya. Findings from an investigation conducted using an observational methodology spanning from 2015 to 2021 revealed a scarcity of waste sanitation infrastructure, inadequate knowledge of waste management, and insufficient supervision by authorities of safety and hygiene, thus allowing residents to dump waste indiscriminately (Masyarakat et al., 2021).

Understanding the urgency of waste management by paying attention to the symptoms in the community, the team in Arjosari Village conducted a waste management socialization and training program. With this treatment, there was an increase in community awareness of waste management in Arjosari Village. The socialization was carried out by involving the environmental agency or Dinas Lingkungan Hidup as a speaker, as well as involving stakeholders and village officials. In the socialization, the community was educated about the adverse effects of littering and the importance of good waste management.

Thirdly, there was a lack of law enforcement and sanctions. In Arjosari, there were no restrictions and sanctions for residents who did littering. This could be seen from the absence of No-Littering-Warning Signs. This phenomenon indicated that not only the residents of Arjosari but also the village officials and stakeholders were still low in environmental awareness, especially regarding the negative impact of littering. On a broader scale, the lack of law enforcement and sanctions related to waste management can have negative effects on the environment. Waste management can have complex negative effects if it is not handled accordingly. Waste that is dumped in the river will eventually become marine debris.

Marine debris is a serious problem in Indonesia, with far-reaching impacts on the environment, public health, and the economy. The amount of marine debris in Indonesian waters continues to increase significantly, with projections of reaching 5.75 million tons by 2021. Plastic waste dominates the composition of marine debris, reaching a weight of 627.80 g/m² or about 35.4% of the total marine debris in Indonesia in 2020. Plastic waste in the ocean causes damage to marine ecosystems. Marine animals such as fish, turtles, and birds often mistake plastic for food, which can result in death from choking or poisoning. In addition, plastic fragmented into microplastics can be absorbed by marine organisms, threatening the health of the food chain. Microplastics that enter the marine food chain can eventually reach humans through the consumption of fish and other seafood. This can potentially lead to health problems such as hormone disruption, digestive problems, and other illnesses caused by toxic chemicals in plastic. The fishing and tourism industries, which are important sources of income for Indonesia, are severely affected by marine debris pollution. Declines in fish populations and damage to coral reefs can reduce catches and the attractiveness of marine tourism, which in turn reduces income for fishermen and tourism businesses.

Law enforcement and sanctions are not nonsense because some countries have implemented this and it is considered one of the most effective ways to suppress the habit of littering. Singapore is known for its cleanliness and its strict enforcement of littering laws. In Singapore, people caught littering can be subjected to high fines, and even social sanctions in the form of community service work. The implementation of these strict rules has succeeded in changing people's behavior to become more responsible for environmental cleanliness (Djafar et al., 2022).

In solving the issues, at several points warning boards had been installed stating the prohibition of littering in a particular place or area. It was hoped that the warning boards could help educate and remind the community to maintain cleanliness and environmental sustainability in Arjosari Village.



Figure 2. The Installation of No-Littering-Warning Signs

Fourthly, it was social culture and habit. The previously mentioned factors such as the lack of adequate waste management facilities, low environmental awareness, and education as well as the lack of law enforcement and sanctions related to waste management in Arjosari would gradually form a culture and habit of the community to underestimate waste management including littering. Cultural and social norms that do not emphasize the importance of cleanliness can cause littering behavior to become a common thing and accepted. Community culture is indeed quite significant in influencing people's habits related to waste management to be good or vice versa.

The preceding statement is reinforced by the latest research in 2023 in Tapak Kuda Village, North Sumatra. Based on the results, the community had good waste management habits because it was influenced by local cultural factors in solid waste management called *Meresik*. This *Meresik* activity has been carried out for generations for more than 50 years and has experienced adaptations to changes in activities. The process of waste management through the *Meresik* activity involves the village community's work scheme. The work scheme is divided into several forms of work, namely *Bertandang Dendang*, *Menaruk Pasang*, *Letak Hanyut*, *Bersih Diri*, and *Makan Berjumpa*. *Bertandang Dendang* is an activity to invite neighbors to collect household, garden, and used goods using a wooden wheelbarrow.

Menaruk Pasang is the process of sorting and storing organic waste in a trench that has been dug. Letak Hanyut is burning plastic or paper waste using firewood to heat livestock pens. Bersih Diri is done after the environmental cleanup, where residents bathe in a public well to prepare for Friday prayers. Lastly, Makan Berjumpa is a communal meal after Friday prayers as a means of friendship and division of waste management roles for the following week. The Meresik activity is motivated by the community's belief in maintaining environmental cleanliness, health, and soil fertility. There is a value of abstinence or prohibition to throw garbage in the sea and mangrove forests, which is a violation of customary norms. Islamic religious views also influence community awareness in maintaining cleanliness and sanitation. The level of community participation in Meresik activity is high, reaching 75%. This shows that the community realizes the important role of the Meresik culture in maintaining good environmental conditions. The community believes that a clean and healthy environment will support the sustainability of economic activities such as fishing and farming. This study also found that the application of the local wisdom of Meresik was related to efforts to overcome disease outbreaks such as malaria and pest attacks on community fields. The smoke from burning leaf waste was believed to repel malaria mosquitoes that were endemic in the coastal area (Hamzah & Nurhasanah, 2023).

This contrasts with the situation in Nigeria where waste management issues especially solid waste were very complex and deeply rooted in cultural, socio-economic, and infrastructural issues. The cultural shift towards Western had significantly increased waste generation. In many urban areas in Nigeria, there was a growing preference for choosing ready-to-eat foods. These foods are often packaged in non-biodegradable packagings such as plastic, aluminum, and other synthetic materials. Traditional consumption patterns, which involved purchasing fresh produce using biodegradable packaging, have largely been replaced by these modern practices. In addition, the choice of food packaging in Nigeria is strongly influenced by cultural preferences. In Nigeria's urban culture, the use of single-use plastics and other non-biodegradable materials is common and is considered convenient and modern. Thus, it contributed to the volume of waste produced. According to the previous explanation, it is true that culture proves to be one of the crucial factors that influence waste management in society (Albert & Olutayo, 2021).

In building a culture and habit from underestimating to overestimating waste management, it was necessary to conduct continuous socialization of the importance of waste management. Giving society an understanding that waste can be converted into more useful goods will gradually build better culture and habits in the community. Therefore, the community service team provided a training program. The program was conducted by teaching the community how to make compost and eco-enzymes from organic waste. This training aimed to provide skills to the community in processing organic waste into useful products. Making composter fertilizer is an environmentally friendly way to manage organic waste and at the same time produce fertilizer that is useful for agriculture or gardens. Meanwhile, Eco Enzyme is a term used to name the fermentation solution produced from the fermentation process of fruits that have been fermented with sugar and molasses. This process involves microorganisms such as bacteria and yeast. Eco Enzymes have a wide range of applications, especially in the context of organic farming and waste management. Some of the benefits of Eco Enzyme are as an organic fertilizer for crops, as natural pest control, and also as organic waste management. As organic fertilizer, Eco Enzymes can help improve soil fertility and promote healthy plant

growth. As a natural pest control, some formulations of Eco Enzymes can help control insects and plant diseases without the use of synthetic chemicals.



Figure 3. The Training of Making Compost and Eco-enzymes

Through this program, the community of Arjosari Sub-village successfully implemented a waste sorting system and produced compost and eco-enzyme products from organic waste. This showed that a participatory approach to waste management could increase the community's capacity, culture, and habit to manage waste independently and sustainably.

4. CONCLUSION

This Community Service Program showed that the participatory approach was very effective in improving waste management in rural communities. Through socialization programs, training, and the establishment of waste banks, there was an increase in community awareness about the importance of waste management. Involving the community in waste management activities was expected to change the habits of people who produce and dispose of waste, the community needed to be more aware and proactive in waste management, get support from the government, and increase the ability to manage waste effectively.

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