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Implementation of Organic and Inorganic Waste Sorting System as an Effort to Improve Environmental Cleanliness

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Abstract: The problem of household waste is still a major challenge in maintaining environmental cleanliness, especially in densely populated areas. Low public awareness in sorting organic and inorganic waste leads to an increase in the volume of mixed waste and a decrease in environmental quality. Community Service (PKM) activities in Sindangsari Village are carried out through the Participatory Action Research (PAR) method, including problem identification, socialization, education, implementation of the waste sorting system, and evaluation. The results of the activity show an increase in public understanding of waste classification and the importance of environment-based management. This program has succeeded in changing people's behavior to sort waste before it is disposed of, reduce the volume of mixed waste, and encourage the use of organic waste into compost and inorganic waste to be recycled or distributed to waste banks. The implementation of this system has proven to be effective in increasing environmental cleanliness and public awareness of sustainable waste management.

Keyword: Mutual Cooperation, Environmental Cleanliness, Environmental Health, Community Participation, Community Empowerment.

INTRODUCTION

The waste problem is one of the environmental issues that continues to develop along with the increasing population, urbanization, and changes in people's consumption patterns. Higher household activities result in an increasing volume of waste, both in the form of organic and inorganic waste. If not managed properly, waste can cause various negative impacts such as environmental pollution, aesthetic disturbances, blockage of drainage channels, and become a source of disease spread. Research shows that ineffective waste management is still a major problem in the community, especially due to low awareness in sorting waste from the source (Mandira et al., 2024).

In Sindangsari Village, waste management problems are still a challenge in maintaining environmental cleanliness. Based on initial observations, it is still found that people have a habit of mixing organic and inorganic waste in one disposal site, making it difficult to follow the management process such as composting and recycling. In addition, the lack of segregated waste bin facilities and the lack of education about the waste sorting system are factors that worsen environmental conditions. This condition has an impact on the accumulation of waste at several points in the residential environment and has the potential to reduce the quality of public health.

Sorting organic and inorganic waste is a very important first step in a sustainable waste management system. Organic waste such as food scraps, leaves, and kitchen waste can be processed into compost, while inorganic waste such as plastic, bottles, paper, and metal can be recycled so that it has economic value. According to Dewi et al. (2023), the implementation of a waste sorting system is able to increase the effectiveness of waste management while reducing the amount of waste disposed of in landfills.

Theoretically, the concept of waste management based on 3R (Reduce, Reuse, Recycle) emphasizes the importance of waste sorting from the source as a strategic step in reducing waste generation and maximizing the reuse of waste that is still of use. In addition, the Theory of Planned Behavior from Icek Ajzen (1991) explains that people's behavior in managing waste is influenced by knowledge, attitudes, social norms, and behavioral control. Thus, changes in people's behavior in sorting waste require a strong process of education, habituation, and social support.

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METHOD

Community Service Activities (PKM) regarding the implementation of organic and inorganic waste sorting systems were carried out in Sindangsari Village using the Participatory Action Research (PAR) approach. This approach was chosen because it emphasizes the active involvement of the community in every stage of activities, from problem identification, program planning, action implementation, to evaluation of results. According to Orlando Fals-

Borda (1987), PAR is a method that integrates the process of research, participation, and social action to produce sustainable change in society.

The initial stage is carried out through direct observation in the community to identify existing waste management conditions, especially related to people's habits in disposing and sorting waste. Observations are focused on household waste disposal patterns, the availability of garbage can facilities, and environmental cleanliness conditions. In addition to observations, brief interviews were conducted with residents and community leaders to find out the level of public understanding of organic and inorganic waste sorting.

Tahap ini bertujuan untuk memperoleh data awal mengenai permasalahan lingkungan dan menentukan kebutuhan masyarakat dalam penerapan sistem pemilahan sampah.

After identifying the problem, a Forum Group Discussion (FGD) was carried out involving the community, RT/RW chairs, environmental cadres, and village officials. This activity aims to discuss the results of observations, explore public perceptions of waste management, and develop strategies for implementing a waste sorting system that is in accordance with local environmental conditions.

At this stage, a technical plan for the implementation of activities is prepared, including determining the location of the placement of sorted garbage cans, the division of tasks, and the schedule for the implementation of education and mentoring.

The next stage is to provide education to the public about the types of waste, the benefits of organic and inorganic waste sorting, and the environmental impact of improper waste management. Educational materials are delivered through counseling, interactive discussions, and waste sorting simulations.

This education refers to the 3R (Reduce, Reuse, Recycle) concept which aims to build public understanding of waste reduction and reuse of waste that still has use value.

The implementation stage is carried out through the provision of sorted waste bins for organic and inorganic waste at strategic points of the environment as well as the direct practice of waste sorting by the community. Organic waste is directed for simple compost processing, while inorganic waste is collected for recycling processes or waste banks.

This activity is carried out in a participatory manner by involving the community as the main implementer in order to create new habits in household waste management.

The last stage is evaluation and monitoring to measure the effectiveness of the program. The evaluation was carried out through observation of changes in community behavior, the level of participation of residents in sorting waste, and changes in environmental cleanliness conditions after the program was implemented.

Monitoring is carried out periodically to ensure the sustainability of the waste sorting system and identify obstacles faced by the community during the implementation of the program.

Through this method stage, PKM activities are expected to be able to improve community knowledge and skills in waste management, build waste sorting habits from the source, and create a cleaner, healthier, and more sustainable environment.

RESULTS AND DISCUSSION

The implementation of Community Service (PKM) activities regarding the implementation of organic and inorganic waste sorting systems in Sindangsari Village is carried out through the stages of problem identification, Forum Group Discussion (FGD), socialization and education, implementation of the waste sorting system, as well as evaluation and monitoring. The Participatory Action Research (PAR) approach used in this activity provides space for active community participation in every stage of the program so as to encourage more sustainable behavior change.

Problem Identification and Field Observation

The results of initial observations show that most of the people in Sindangsari Village still have not implemented a waste sorting system at the household level. Organic waste such as food scraps and dried leaves is still mixed with inorganic waste such as plastics, bottles, and paper in one disposal container. In addition, the limitation of segregated waste bin facilities was found in the community.

This condition has an impact on increasing the volume of waste mixtures that are difficult to process further and cause waste accumulation at several points in the environment. This finding is in line with research by Mandira et al. (2024) who stated that the low habit of sorting waste from the source is one of the main causes of ineffective waste management at the community level.

From the perspective of the theory of planned behavior (Theory of Planned Behavior), this condition shows that behavior in the management of waste communities is still influenced by low knowledge, old habits, and lack of social environmental support (Ajzen, 1991).

Figure 1. Early Conditions of the Waste Management System

Forum Group Discussion (FGD)

Pelaksanaan FGD menghasilkan peta permasalahan dan solusi yang lebih konkret. Masyarakat mengidentifikasi beberapa faktor utama yang menyebabkan belum optimalnya sistem pemilahan sampah, yaitu kurangnya pemahaman tentang jenis sampah, belum tersedianya fasilitas pemilahan, dan belum adanya sistem pengelolaan sampah berbasis komunitas.

Melalui FGD, masyarakat bersama tim PKM menyepakati penerapan sistem pemilahan sampah sederhana dengan membedakan sampah organik dan anorganik di tingkat rumah tangga. Selain itu, disepakati pula pemanfaatan sampah organik untuk pembuatan kompos dan pengumpulan sampah anorganik untuk bank sampah.

Hasil ini menunjukkan bahwa partisipasi masyarakat dalam proses perencanaan mampu meningkatkan rasa memiliki terhadap program. Hal ini sesuai dengan konsep PAR yang menempatkan masyarakat sebagai subjek utama dalam perubahan sosial (Orlando Fals-Borda , 1987).

Figure 2. Forum Group Discussion with the Community

Results of Socialization and Education of Waste Sorting

The socialization activity showed that there was an increase in public understanding of the classification of organic and inorganic waste and the benefits of waste sorting for the

environment and economy. People are beginning to understand that organic waste can be used as compost, while inorganic waste has economic value if recycled or channeled to waste banks.

These results are in line with the research of Septian et al. (2023) which found that waste sorting education is able to increase public knowledge while forming collective awareness in maintaining environmental cleanliness.

In the perspective of the 3R (Reduce, Reuse, Recycle) theory, education is an important factor in changing people's mindset from just throwing away waste to managing waste as a resource that can be reused.

Figure 3. Socialization and Education of Waste Sorting

Results of the Implementation of the Waste Sorting System

At the implementation stage, the community began to sort waste in households using separate garbage cans that had been provided. Organic waste is collected to be processed into simple compost, while inorganic waste is separated for recycling or sale through waste banks.

The results of the implementation show a change in the behavior of people who are starting to get used to sorting waste before it is disposed of. In addition, the organizational environment looks cleaner due to the reduced scattered waste mixture.

These findings support the research of Dewi et al. (2023) who stated that the application of waste sorting discipline is able to improve the quality of environmental cleanliness and strengthen people's clean living behavior.

Practically, the waste sorting system implemented also opens up economic opportunities through the use of inorganic waste with selling value and compost processing from organic waste.

Figure 4. Results of the Implementation of the Waste Sorting System

Evaluation and Monitoring Results

The results of the evaluation show that the implementation of the waste sorting system has a positive impact on changes in community behavior and environmental conditions. The level of community participation in sorting has increased, awareness of maintaining environmental cleanliness has improved, and the volume of mixed waste disposed of in temporary landfills has decreased.

However, there are still several obstacles, such as the regularity of the community in sorting waste every day and the limitations of supporting facilities such as compost processing sites and a more structured inorganic waste collection system.

Based on the monitoring results, the desire program requires support from the village government, environmental cadres, and the community together so that the waste sorting system can become a sustainable habit.

Figure 5. Evaluation and Monitoring Results

This PKM activity shows that the implementation of organic and inorganic waste sorting systems is an effective strategy in improving environmental cleanliness in Sindangsari Village. In addition to having an impact on environmental quality, this program also increases public awareness and opens up opportunities for more economically and ecologically productive waste utilization...

CONCLUSION

Community Service Activities (PKM) regarding the implementation of organic and inorganic waste sorting systems in Sindangsari Village show that waste sorting from the source is a strategic step in improving environmental cleanliness and building public awareness of sustainable waste management. Based on the implementation stages which include problem identification, Forum Group Discussion (FGD), socialization, implementation, and evaluation, this program has succeeded in identifying the main problems in the form of low community habits in sorting waste, limited supporting facilities, and low understanding of proper waste management.

The results of the activity showed that there was an increase in public knowledge and awareness about the differences between organic and inorganic waste and the benefits of its separation for environmental cleanliness and the economic value of waste. The implementation of the waste sorting system at the household level also shows a change in the behavior of people who are starting to get used to sorting waste before it is disposed of. In addition, environmental conditions have become cleaner and the volume of waste mixtures has decreased.

However, the desired program still faces challenges in the form of consistency in community behavior in implementing regular waste sorting and limited supporting facilities for advanced waste management such as composting and waste banks. Therefore, continuous assistance, strengthening education, and support from the village government are needed and so that the community system for waste sorting can run optimally and sustainably.

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