SUSTAINABLE WASTE MANAGEMENT INNOVATION WITH NEWLEAD RUIN-TECH TECHNOLOGY THROUGH PARTICIPATION COMMUNITY

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Abstract - *Plompong Village, located in Sirampog District, Brebes Regency, faces significant challenges in waste management, primarily due to inadequate infrastructure and a lack of community awareness regarding sustainable waste management practices. This community service program aims to enhance waste management in the village through the implementation of Newlead Ruin-Tech technology, an innovative approach capable of transforming waste into valuable products. The methodology employed is a case study with a qualitative approach, involving observation. The program's implementation engages the local community and village government to support the technology's adoption. The results of this study demonstrate that the Newlead Ruin-Tech technology can significantly reduce waste volume, improve the quality of life for the community, and maintain ecological balance. The success of this program is expected to serve as a model for other regions with similar characteristics to achieve more effective and sustainable waste management.*

Keywords: *Waste Management, Newlead Ruin-Tech Technology, Community Participation.*

1. INTRODUCTION

Waste management in Indonesia has become one of the main challenges in an effort to preserve the environment. Waste is a global problem that if not handled seriously will cause many negative impacts on both the environment and public health. According to data from the Ministry of Environment and Forestry (KLHK), by 2022, Indonesia will produce around 67.8 million tons of waste per year, with 15% of it coming from rural areas. Improper waste management in rural areas can cause various environmental problems, such as soil and water pollution, as well as health problems for local communities.

Plompong Village, located in Sirampog Sub-district, Brebes Regency, is one example of an area that faces challenges in waste management. The increase in population and economic activities in this village has led to an increase in waste volume that requires more effective handling. The lack of adequate waste management infrastructure and technology has led to the accumulation of waste in various locations, threatening the balance of the ecosystem and the quality of life of the villagers. This condition is exacerbated by the lack of public awareness of the importance of good waste management.

Objectively, the assisted community in Plompong Village, which consists of a team of students who are conducting Real Work Lectures (KKN) as tangible evidence of community service programs, collaborates with village officials and technicians from Pemalang who participate in assisting and socializing the use of tools that will be used to overcome the waste problem in Plompong Village. Lack of knowledge and limited technology in waste management are the main challenges faced. In addition, limited access to modern waste management facilities and adequate environmental education also contributed to the lack of public awareness of the importance of sustainable waste management.

From the existing obstacles, the mentoring team held a seminar, with the aim that this environmental care seminar could increase the community's awareness of the importance of protecting the environment by not littering. As has been done until now, where people dispose of their waste in Kali Udik, which is a routine habit of the people of Gunung Sumping Hamlet. The lack of access to land owned by the Plompong Village Government is one of the main factors causing the absence of a landfill in the village. As a result, the community, especially Gunung Sumping Hamlet, often disposes of their household waste in Kali Udik, which causes mountains of garbage and air pollution for the surrounding community.

In an effort to address this issue, Newlead Ruin-Tech technology emerged as an innovative solution that can help manage and reduce waste in Plompong Village. Newlead Ruin-Tech is a waste management technology designed to convert waste into

products that can be reused, thus reducing the volume of waste that must be transported to landfills. This technology is not only effective in reducing the amount of waste, but is also environmentally friendly and can be operated at a relatively low cost.

It can be seen from several previously conducted studies that technology-based waste management has great potential in supporting environmental sustainability if implemented appropriately. According to According to research conducted by Lasaiba in 2024, by raising public awareness about the importance of waste management, recycling, and waste reduction. By developing appropriate infrastructure and implementing innovative solutions, regions can reduce the negative impacts of waste management. Furthermore, research conducted by Desromi in 2022 which explains the results with the application of biodigester technology in waste management in Pandan Village can provide benefits to the community, including income from the economic value of waste such as fertilizer, gas, and electricity. In addition, the problem of waste in the general public can be reduced, so that the use of the environment as conservation is a single strategy to promote the preservation of natural resources and improve human welfare. Just like Indrawati's research in 2020 that by making waste processing machine technology that can be utilized by Bandungrejo Village, it can effectively reduce the waste problem in the village and the successful application of waste management technology is highly dependent on the active participation of the community and the support of the local government.

Thus, the application of Newlead Ruin-Tech technology in Plompong Village not only aims to reduce waste volume, but also improve the quality of life of the community through better environmental management. This program is expected to become a sustainable waste management model and can be replicated in other areas with similar characteristics. With support from the local government, community, and other stakeholders, Plompong Village can achieve better waste management, which in turn will improve the quality of life of the community and preserve the environment.

2. METHODS

This research uses a qualitative approach with a method in the form of a case study. Case study is a method that seeks to reveal the uniqueness or uniqueness of the characteristics of a subject under study (Hamzah, 2020). Data collection techniques used observation, interviews and literature studies. The research place was conducted in Plompong Village, Sirampog District, Brebes Regency, while the research time was conducted on July 11-August 25, 2024.

The approach model applied in this service activity is to involve partners, namely Pemalang technicians as a team in assisting the implementation of the use of technology directly both as subjects and objects of activity implementation starting from the

planning, implementation and evaluation stages of the activity program (Participatory Rural Appraisal and Community development) through the use of appropriate technology, namely Newlead- Ruin Tech which is carried out through appeals and support without an element of coercion so that partners can play an active role (persuasive) which is packaged in the form of activities in the form of socialization, training, mentoring (educative).

To strengthen the process of the implementation method carried out above, this research uses three steps, namely first, sorting data in various ways to find strong data; Second, verifying data by compiling the data sources obtained and to present in the analysis of a result and discussion; Third, drawing conclusions, a process to take the essence of a result and discussion that has been explained (dedah jubaedah, 2022). The collected data will then be summarized and analyzed in order to produce a writing that is persuasive / influences readers that the technology used is effective in waste management (Brigita manik, 2023)

3. RESULTS AND DISCUSSIONS

1. Dynamics of the Mentoring Process

Plompong Village, located in Sirampog Sub-district, Brebes Regency, faces significant challenges in waste management. The lack of adequate waste management infrastructure and technology has led to the accumulation of waste, which threatens the balance of the ecosystem and the quality of life of the villagers. In an effort to address this issue, Newlead Ruin-Tech technology emerged as an innovative solution that can help manage and reduce waste in Plompong Village.

a. Development of waste management mentoring process using Newlead Ruin-Tech technology

The government and community must prepare the infrastructure that supports the use of this technology, such as management facilities and the use of by-products from the waste management process. This ensures that the Newlead Ruin-Tech technology can be effectively integrated into the existing waste management system in Plompong Village, most importantly the combustion process does not cause bad air pollution. Because, if this is not considered, then the impact of this air pollution will also threaten health problems in the surrounding community. Furthermore, recording the cost efficiency in using the technology, so that when the community uses the technology in daily waste management, it is not burdensome. In this case, there needs to be assistance from the village government who is ready to change to

use the technology, as a waste management tool, and as a solution in caring for the environment around Plampong Village in a sustainable manner.

Figure 1 Waste Management Assistance Process with Newlead Ruin-Tech Technology

b. Implementation of the waste management assistance process using Newlead Ruin-Tech technology

Figure 2 Environmental Care Seminar and Launching of Newlead Ruin Tech Waste Burning Products

The implementation process of using Newlead Ruin-Tech technology begins with an educational process through the introduction of the tools to be used. In this case, the community is involved in an education program to raise awareness about the importance of good waste management and how to use Newlead Ruin-Tech technology. This education can be done through various media, such as training, seminars, and public awareness campaigns.

The education process carried out, namely, by providing socialization through seminar activities with the theme "Caring for the Environment and Launching Newlead Ruin-Tech Waste Burning Products", so that residents of Plompong Village, especially Gunung Sumping Hamlet, are able to gain insight related to the dangers of littering. The purpose of this seminar is so that people know the importance of good waste management and how to use Newlead Ruin-Tech technology. The community must be involved in the decision-making process and technology implementation to ensure that the solution provided is in accordance with local needs and conditions.

The support from the Plompong Village government itself is in the form of providing the necessary infrastructure costs, in socializing community awareness, and conducting monitoring and evaluation. Monitoring and evaluation of the application of this technology to ensure its effectiveness and make necessary changes. This makes it possible to identify areas that need improvement and enhance the technology's performance in managing waste.

1. Description of social and behavioral changes in the community of Desa Plampong, Kecamatan Sirampog, Kabupaten Brebes.

The implementation of the use of Newlead Ruin-Tech technology has increased public awareness about the importance of good waste management. The community is now more aware of the negative impacts of waste accumulation and more participatory in efforts to manage and reduce waste. In addition, with this technology, people in Plompong Village have experienced behavioral changes in managing waste. They are more careful in disposing of waste and prefer to convert waste into products that can be reused, thus reducing the volume of waste that must be transported to landfills.

The government, in collaboration with the team driving this technology, has provided specialized training, to improve the skills of residents in operating this Newlead Ruin-Tech technology. Thus, the community can optimally utilize the technology for mutual welfare and progress.

4. DISCUSSIONS

Rural waste management is a series of activities to collect, transport, process, recycle and dispose of waste. Good waste management is essential to ensure a clean and healthy environment. Villages are usually dominated by organic waste generation from agricultural activities, plantations, and livestock, so it is important to pay attention to waste management in villages to keep the surrounding environment clean and healthy.

Some rural waste problems also involve individual patterns of waste management, such as burning, burying, and dumping waste into waterways or rivers. This occurs due to differences in physical characteristics, community characteristics, and the lifestyle of the community, as well as the limited waste management facilities available in the surrounding area.

The use of technology in waste management can help overcome the challenges faced by rural areas. The development of technology in these remote villages can help democratize the community. The implementation of technologies such as Newlead Ruin-Tech introduced in Plompong Village can transform waste into reusable products.

1. Linkage of Service Results with Relevant Theories

Waste management using Newlead Ruin-Tech technology in Plompong Village can be linked to the theory of community-based waste management. This theory emphasizes the importance of involving the community directly in the waste management process, from waste collection at the household level to processing and recycling. With this technology, the people of Plompong Village can play an active role in converting waste into products that can be reused, thus reducing the volume of waste that must be transported to landfills. This is because waste-related problems are caused by the community's daily activities. For this reason, massive community participation is needed in its management so that the waste problem can be efficiently resolved.

As in the research conducted by Purwendah in 2022, community-based waste management is an approach to waste management based on active community participation. This is because environmental management requires facilitation and implementation of community-based efforts as a strategy to empower and increase their access to environmental resources. Furthermore, Saputro's research in 2015, that waste management with community participation, can easily carry out the waste management process, because each element such as the government and society can carry out their duties according to their respective portions. So that with good cooperation, it can make a policy run smoothly. It is also explained in the results of Soedarto's research, that community-based waste management in Pleburan Village uses the 3R principle (Reduce, Reuce, recycle) by involving the community.

In addition, waste management using Newlead Ruin-Tech technology can also be understood through the theory of ecosystem balance. Waste that is not managed properly can lead to environmental pollution and disruption of ecosystem balance. By converting waste into products that can be reused, this technology helps maintain ecosystem balance and improve the quality of life of the community. In addition, a balance between all parties is also needed in overcoming the waste problem, which according to the research results recommends increasing public education, strengthening law enforcement, and investing in waste management technology and infrastructure. With a holistic and collaborative approach, waste management in an area is expected to be more effective and sustainable,

2. Theoretical Reflections from the Mentoring Process to the Occurrence of Social Change

The mentoring process in waste management using Newlead Ruin-Tech technology in Plompong Village, Sirampog District, Brebes Regency, can be analyzed through various theoretical perspectives, one of which uses the theory of community participation which is an important point in the waste management process in Plumpong Village. The mentoring process must involve active participation from the community. This participation includes decision-making, program implementation, and evaluation of results. Thus, the people of Plompong Village are not only objects of technology application, but also active subjects in determining the best way to manage their waste. Therefore, the participation of the community can directly assess the success rate of this technology.

The mentoring process begins with providing information about Newlead Ruin-Tech technology to the community through various education and training activities. This step is important to ensure that the community has sufficient understanding of the benefits and how the technology works. After that, the community is invited to consider applying this technology in their waste management. The active participation of the community in this stage is very important to ensure that this technology can be adopted effectively.

With the application of this technology in the waste management process, it has an impact on social change and community behavior. Changes that occur in society can be structural or cultural. In Plompong Village, the social changes that occur can be seen from several aspects. First, there is a change in community behavior and habits related to waste management. Before the assistance, waste management was done conventionally and less effectively. However, with the Newlead Ruin-Tech technology, the community began to apply new methods that are more efficient and environmentally friendly. Second, there were changes in the social structure, especially

in terms of roles and responsibilities in waste management. With the assistance and application of the technology, the villagers gradually formed working groups tasked with managing waste using the technology. This reflects the strengthening of local capacity and increased community involvement in environmental resource management.

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