

Utilization of Plastic Waste in Sarirejo Village Ngaringan District Grobogan Regency

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Abstract

This community service activity aims to empower and improve the skills of the Sarirejo Village community through the activities of Pemberdayaan dan Kesejahteraan Keluarga (PKK) women in Sarirejo Village and elementary school students in Sarirejo Village in utilizing plastic waste into ecobricks for mothers. Vertical garden and piggy bank for elementary school students, as well as fashion show competition for Galsari Hamlet residents. Community service activities were carried out by counseling methods for PKK Sarirejo Village women, Sarirejo Village Elementary School students, and Galsari Hamlet residents regarding the importance of using and processing plastic waste, the practice of using plastic waste into ecobricks, vertical gardens, piggy banks, and costumes. In carrying out activities, mentoring and evaluation of activities are carried out. The participation and enthusiasm of PKK women in making ecobricks as well as Sarirejo Village Elementary School students and Galsari Hamlet residents in activities were very good and actively contributed to counseling and plastic waste processing practices. The impact of this community service activity was able to increase public awareness regarding the importance of processing plastic waste in Sarirejo Village into ecobricks, vertical gardens, piggy banks, and costumes. This community service activity is expected to continue and benefit the people of Sarirejo Village.

Keywords: Community Service, Mentoring, Empowerment, Ecobricks, Vertical Garden, Piggy Bank, Fashion Show.



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INTRODUCTION

Garbage according to Law Number 18 of 2008 concerning Waste Management is the residue of human daily activities and/or solid natural processes. Plastic waste is one of the environmental problems that until now has not been resolved. Based on data from the Ministry of Environment and Forestry (KLHK) for national waste in 2021 it is said that the total will reach approximately 65.8 million tons of which around 11.6 million tons is plastic waste. Utilization of plastic waste has an important role in reducing the amount of waste accumulation in any place. In Law Number 18 of 2008 concerning Waste Management it is explained that all city/regency governments must change the waste disposal system to a waste management system. Waste must be managed from the upstream and downstream levels, not only disposed of at the Final Disposal Site (TPA).

Based on data from the National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry, in 2021, waste generation from 228 districts in Indonesia will reach 28,654,799.96 tons per year. Meanwhile for Grobogan Regency, Central Java, the current volume of waste is around 560 tons per day and only around 60 tons of waste can be handled or around 12.5 percent of the volume of waste generated.

Tahun	Provinsi	Kabupaten/Kota	Timbulan Sampah Harian (ton)	Timbulan Sampah Tahunan (ton)
2021	Jawa Tengah	Kab. Grobogan	848.15	309,573.61
			848.15	309,573.61

Figure 1. Data on Waste Generation in Kab. Grobogan Year 2021

Source: National Waste Management Information System (SIPSN) Ministry of Environment and Forestry

Waste management in Sarirejo Village itself has received little attention. In this case, it can be seen from the majority of village people who still throw garbage behind their houses or ravines and even in the nearest river. So that the waste in Sarirejo Village is one of the unresolved problems. This is supported by the lack of education related to waste sorting in the Sarirejo Village community and the absence of a Temporary Waste Storage Site (TPS) in Sarirejo Village. In addition, the constraints of transportation such as garbage trucks which are difficult to enter the village are also one of the influencing factors in the behavior of the village community in littering and burning waste.

There are several factors that affect waste processing, namely the spread and increase in population, socio-economic factors, and environmental characteristics both physical, attitudes, behavior and culture that exist in the community. In the Regulation of the Minister of Public Works of the Republic of Indonesia Number 3 of 2013, a temporary storage site (TPS) is a place where before waste is transported for recycling, processing and an integrated waste processing site. Integrated waste processing site (TPST) is a place where collection, sorting, reuse, recycling, processing and final processing are carried out. Based on this, it is necessary to socialize the importance of waste management and how to process waste into useful goods for the people of Sarirejo Village. Waste management into useful goods, including through the manufacture of ecobricks, vertical gardens and piggy banks. Thus, the volume of landfill waste can be reduced and can minimize the emergence of environmental pollution.

IMPLEMENTATION METHOD

Community service activities regarding waste management are carried out through several stages, including the preparation, socialization, and training stages.

1. Preparation Stage. The preparatory stage for making ecobricks is carried out by coordinating with the Secretary of the Sarirejo Village PKK. Meanwhile, the creation of a vertical garden is in coordination with the Principal of SD Negeri 1 Sarirejo. Then, making piggy banks in coordination with the Principal of SD Negeri 2 Sarirejo. The preparations for the fashion show competition were carried out by coordinating with the Galsari Dusun Youth Organization. These preparations were prepared together to plan activities to be carried out in the future with the aim of utilizing waste into useful items.
2. Socialization Stage. The socialization stage is carried out in three ways, namely the socialization of ecobricks, vertical gardens, and piggy banks. The socialization of ecobricks is carried out by delivering material about the benefits and how to make ecobricks using plastic waste. Furthermore, socialization of the vertical garden through the delivery of material regarding the importance of planting, how to make a vertical garden using used plastic bottles and their benefits. Then socialization of making piggy banks in the form of delivering material about the importance of saving and how to make piggy banks from used bottles. The socialization of the fashion show competition was carried out by delivering material to the Galsari Dusun Youth Organization.

3. Training Stage. In the third phase, training was conducted on waste management to become ecobricks and assembling ecobricks into small benches with PKK members. Then, training on making vertical gardens was carried out with elementary school students by utilizing used plastic bottles planted with vegetables such as chilies, tomatoes and eggplants. Training on making piggy banks with elementary school students was carried out using used plastic bottles that were perforated and painted to make them look more attractive. While training on making clothes from plastic waste was carried out through fashion show competition activities at the commemoration of the 77th Indonesian Independence Day.

DISCUSSION RESULTS AND IMPACT

Garbage is one of the problems faced by the people of Sarirejo Village, especially household waste. According to Law Number 18 of 2008 concerning Waste Management, household waste is waste that comes from daily activities in the household, excluding feces and specific waste. People often throw household waste into gardens or ravines, including plastic waste. The increasing pile of plastic waste can cause pollution to the environment, because plastic has properties that are difficult to decompose so it can reduce soil fertility. Plastic waste that is in the soil that cannot be decomposed by microorganisms causes the minerals in the soil, both organic and inorganic, to decrease, this causes the scarcity of soil fauna, such as worms and soil microorganisms, that live in the soil area, due to the difficulty in obtaining food. and take cover. In addition to throwing garbage into the river, people also tend to burn heaps of plastic waste. This of course can cause air pollution. The smoke from burning waste contains several toxic substances such as monoxide and nitrogen oxides. If these toxic substances are released into the air it can cause air pollution. Combustion smoke can also cause health problems such as irritation, respiratory and reproductive system disorders, cancer, and even death.

The problem of plastic waste must be handled wisely so as not to have a negative impact on society and the environment. At present, the method that has been widely used by the public to reduce the negative impact of plastic waste is to manage plastic waste with the 3R concept, which stands for Reuse, Reduce and Recycle. One of the efforts to manage plastic waste can be done by involving the empowerment of the surrounding community. In this way, people can also understand the negative impact of waste and the importance of waste management, so as to reduce plastic waste that accumulates in the environment. Management of plastic waste in Sarirejo Village involves the role of the community including PKK mothers and school children.

Managing plastic waste with the Sarirejo Village PKK members into ecobricks is a practical and inexpensive solution to reduce the amount of plastic waste and plastic bottles. Ecobricks are plastic bottles filled with used, clean and dry plastic waste at a certain density that can be used as building materials and can be used repeatedly. The waste used is dry and clean plastic bottles and other plastic waste. Ecobricks that have been compacted can be arranged so that they can become more useful products such as tables, chairs, trash cans, building replicas (gates and walls) and others. Making ecobricks into more useful items such as benches requires quite a long time. These stages start from the preparation stage to the training to become a product that has a sale value.



Figure 2. Stages of Filling Bottles with Plastic



Figure 3. Ecobricks Assembly Stage

The use of plastic waste into ecobricks is very effective in reducing the generation of plastic waste in Sarirejo Village because the process of making ecobricks requires a large amount of plastic waste. There are several things that must be considered in the process of making ecobricks so that the results are stronger. This means that the size of the bottles used must be the same so that it is easy to assemble, the plastic waste used must be clean and dry so it doesn't rot, the plastic waste put in plastic bottles must be solid and not hollow so that it is strong. The way to make ecobricks is to prepare materials and tools including plastic bottles of the same size, plastic waste, wooden or bamboo sticks, and scissors. The plastic waste used can be in the form of plastic bags, plastic food and beverage packaging, detergent packaging, straws, raffia rope, and other plastic waste. If plastic waste is still dirty, it needs to be cleaned or washed before use. Plastic waste is cut into small pieces, then put into bottles, then compacted using wooden or bamboo sticks until there are no voids left. Plastic bottles filled with plastic waste are then arranged into tables, chairs, and others with the help of glue or wire.

Another way to manage plastic waste is through the creation of a vertical garden with the students of SD Negeri 1 Sarirejo. Vertical gardens or vertical gardens or green walls or living walls or also known as wall gardens are plants and other garden elements arranged in such a way as to be perpendicular or nearly perpendicular to a garden for a relatively long time. Vertical gardens are one of the solutions to reduce plastic waste, especially waste in the form of plastic bottles. In addition, a vertical garden is one of the solutions for farming on narrow land. The vertical garden method is basically a method in which a series of plants planted on the planting medium are then arranged vertically. Vertical gardens have many advantages, including saving land, easy maintenance, reducing air pollution, being easy to move, and beautifying the room.



Figure 4. Planting Plants Using Bottled Media



Figure 5. Vertical Gardens

Making this vertical garden uses vegetable plants in the form of eggplants, tomatoes and chilies. The materials used include used plastic bottles, plants, rope, and paint. The method of manufacture is that used plastic bottles are cut into two parts, then the outer surface of the bottle is painted to make it more attractive. Furthermore, a plastic bottle is perforated in the body of the bottle as a place for water to escape, so that when the plants are watered the water does not stagnate. The next step is to fill the bottles with soil that has been mixed with fertilizer and then plant vegetables. The last step is to string the bottles that have been planted with the plants, then the bottles are hung vertically on an empty wall and watered regularly so that the plants can thrive. Making a vertical garden by utilizing plastic bottles is considered quite effective in reducing plastic waste in the form of bottles. This vertical garden can also train children's creativity in farming and understanding waste management, especially plastic waste.

The solution to further reducing plastic waste is through making piggy banks which is carried out with the students of SD Negeri 2 Sarirejo in a savings movement from an early age. An understanding of saving must be taught to children from an early age so that they have the awareness to live frugally. Providing education and understanding of the concept of saving must be started and accustomed to at an early age because at that moment children are easier to absorb information and have a high curiosity. This savings education will provide an understanding of the importance of saving and train children to save from a young age. The benefits of teaching children to save from an early age are that children are used to learning to manage personal money, have financial planning, value money, learn discipline, and make them proud.



Figure 6. Socialization of Saving



Figure 7. Making Piggy Banks

This saving movement is carried out by delivering material on the importance of saving and making piggy banks from used plastic bottles. Making this piggy bank only requires plastic bottles so it can help reduce the amount of plastic waste in the environment. The way to make it is starting with preparing used plastic bottles that are clean and dry because it is to save money. The bottle is painted to make it look attractive and then holes are made in the upper body of the bottle. This savings movement can motivate children to be more active in saving from an early age and know how to manage finances well so that they can appreciate the money they have more. Thus, children are expected to be able to set aside the money they have for savings so that they can train them to live more economically. Saving also trains children to live independently, they can use their savings to buy school needs, such as books, pencils, and more.

Waste management is a costume with the residents of Galsari Hamlet, Sarirejo Village is also one of the creative and innovative solutions to reduce waste. In addition, this activity can also train the creativity of Sarirejo Village residents to turn waste into costumes that look unique and have high artistic value. Materials used for making costumes include plastic waste, waste paper, and patchwork. Various plastic waste is created into costumes that can be used immediately (ready to use). The designed costumes were displayed in a fashion show on the

77th anniversary of the Republic of Indonesia's independence. This activity is quite effective in reducing waste because costume making uses a large amount of waste. In addition, this activity can also increase public awareness in maintaining cleanliness and environmental sustainability.



Figure 8. Fashion Show Costumes from Garbage

CONCLUSION

The conclusions from the community service activities carried out were: Making ecobricks was carried out with PKK Sarirejo Village women with the socialization and practice of making ecobricks. The manufacture of ecobricks utilizes plastic waste and plastic bottles. ecobricks are then assembled into useful items, namely small benches. Making a vertical garden was carried out with students from SD Negeri 1 Sarirejo with the socialization and practice of making a vertical garden. Creating a vertical garden utilizes waste plastic bottles and plants. The saving movement was carried out by socializing and making piggy banks with the students of SD Negeri 2 Sarirejo. The manufacture of piggy banks utilizes perforated plastic bottle waste. Garbage management is a costume with the residents of Galsari Hamlet which is also a creative solution to reduce waste. The manufacture of costumes utilizes waste in the form of plastic waste, used paper and rags.

Acknowledge

The author would like to thank UPKKN UNS for facilitating the implementation of KKN activities for the July-August 2022 period. work in the form of plastic waste management.

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