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Utilization Of Non-Organic Waste To Make Crafts From Ecobrick In Increasing Environmental Law Awareness

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ABSTRACT

Plastic waste takes decades and even hundreds of years to decompose while every day we always use. Recycling waste can be a good small step. One way to recycle is through ecobricks. Ecobricks are a plastic waste management technique made from used plastic bottles that have been filled with various plastic waste until they are full and then compacted until they become hard. The purpose of this study is to reduce the pile of plastic waste so that the pile of plastic waste can be slightly reduced and increase public awareness of the dangers of plastic waste and what efforts the bima city government has made to deal with problems regarding plastic waste which can only be handled only 78%. This research uses empirical methods using primary data. The data collection techniques include observation and interviews obtained from the people of Bima city and the Environmental Service. The results of this study found that many people still do not care about the dangers of plastic waste, the community also does not know much that plastic waste can be turned into valuable crafts that can generate monetary value, the community only knows that plastic bottle waste can only be decomposed into flower pots. Based on these findings, the community can understand the importance of maintaining environmental cleanliness and the dangers of plastic waste if not processed properly, and be able to provide new innovations for the community that plastic waste can be processed into useful and valuable crafts such as ecobrik products in the form of chairs, tables, and others.

Keywords: *craft; ecobrick; plastic waste*

INTRODUCTION

Indonesia is known as a country that has abundant natural resources, both biological and non-biological wealth. However, along with the times, Indonesia has actually become the second waste-producing country in the world, this is due to the increasing amount of waste generated from community activities that have an impact on the destruction of the environment and existing ecosystems. One of the types of waste that is very large is plastic waste. Indonesia is the fourth most populous country in the world, with a total population of 237 million. It is estimated that this population will increase to 270 million by 2025. With such a large population, it is estimated that 130,000 tons/day of waste will be generated. This is a huge potential resource, but currently most of it is still a source of pollution. The overall population of Indonesia living with poor sanitation conditions reaches 72,500,000 people. The Ministry of Health states that in Indonesia there are 240 cities facing waste management problems (Wuri Sulistiyorini Purwanti et al., 2015).

Plastic waste is inorganic waste or non-renewable waste. This plastic waste takes tens or even hundreds of years to decompose while every day we always use plastic for household needs such as food or beverage wrappers, mineral water bottles, children's toys, and many others. The increase in plastic waste will become a serious problem in our lives, considering the many negative impacts caused by plastic waste such as carcinogenic substances that can trigger cancer, cause ecological damage, cause flooding, cause bad odors, and spread various types of diseases.

The habit of burning waste has become a culture in the community, both in rural and urban areas. They have not realized that the types of waste today are different from those of the past. The types of waste today tend to be dominated by chemical synthetic waste such as plastic, rubber, Styrofoam, metal, glass etc. If the waste is burned, it will emit toxic gases that can endanger the health of the people who breathe it and worsen the quality of the air environment. For example, the burning of plastic waste produces dioxin gas which has 350 times the toxicity of cigarette smoke. Dioxin is super toxic and carcinogenic when it

enters the human body tissue, especially the nerves and lungs, so that it can interfere with the nervous and respiratory systems including causing cancer. Styrofoam combustion will produce CFCs that can damage the ozone layer and are harmful to humans (Sri Subekti, 2010). Waste problems absolutely must be handled jointly between the government, non-governmental organizations and the community itself. Therefore, it requires mutual awareness and commitment towards changing attitudes, behaviors and ethics that are cultured in the environment.

Ecobricking is a plastic waste management technique made from used plastic bottles that have been filled with various plastic waste until they are full and then compacted until they become hard. Once the bottles are full and hard, they can be strung together with glue and assembled into tables, simple chairs, wall building materials, towers, small stages, etc. (Yusiyaka and Yanti, 2021). According to Manisha and Singh (2017) in (Palupi et al., 2020) ecobricks have several benefits, the first of which is ecobricks as an efficient way to process plastic waste and can be done by everyone because of its easy manufacture. Ecobricks also protect the environment by reducing plastic waste. According to Lenkiewicz and Webster (2017), everyone in a community can join in making ecobricks including children. Currently, ecobrick products are formed into something useful such as chairs, tables, to substitute bricks in making houses (Fauzi et al., 2019). In addition, ecobricks in terms of aesthetics and economy can support the lives of urban communities, such as the use of ecobricks for potted plants at home, as a display, material for making fish ponds and so on (Abdullah & Jamaai, 2016: 20-24).

In Indonesia, there are several laws and regulations that have a correlation or are directly related to waste management, namely Article 28 H paragraph (1) of the 1945 Constitution of the Republic of Indonesia; Law, No. 32 of 2004 on Government. Regions was replaced by Law No. 18 Year 2008 on Waste Management and several local regulations that have been established by local governments at the district or city level.

Based on the description above, the formulation of problems that can be drawn, namely (1) How to reduce plastic waste in the city of Bima; (2) How is the government's policy in overcoming the problem of plastic waste in Bima; (3) How to increase the awareness of the people of Bima of the dangers of plastic waste in the surrounding environment? Bima City is one of the areas that produces waste with a volume of 80.68 tons of waste every day and can only be handled only 78 percent. This was conveyed by the Regional Secretary of Bima City, Muhtar Landa, on Tuesday (6/2/2024) when inaugurating the Waste Bank Parent (BSI) at the Bima City Environment Agency office. The Secretary explained that in 2023, the amount of waste production in Bima City will reach 80.68 tons per day or 29,448 tons per year and the waste is dominated by plastic waste.

This research aims to reduce the pile of plastic waste so that the pile of plastic waste waste can be slightly reduced and increase public awareness of the dangers of plastic waste and what efforts the bima city government has made to deal with problems regarding plastic waste which can only be handled only 78%.

This research is useful in increasing public knowledge that plastic waste can be processed into ecobrik which can produce valuable crafts, as well as increasing public awareness about the dangers of plastic waste, and can also foster an entrepreneurial spirit for the community.

METHOD

The method used in this research is an empirical method using primary data. The data obtained through observation or observation and interviews, then the data is analyzed qualitatively descriptively, namely providing a description or explanation or the object under study. As for determining the information, the researcher uses purposive sampling technique, where the source sampling technique is based on certain considerations with case studies and research objectives (Lenaini; 2021). Primary data will be obtained from the results of observations and interviews obtained from the people of BIMA CITY and the ENVIRONMENTALISM while secondary data will be obtained through news, journal literature, books and articles.

RESULTS AND DISCUSSION

Reducing Plastic Waste in Bima City

The volume of waste continues to grow every day. The problem is complicated by the high use of various plastic bottles and packaging that produce inorganic waste that is not easily decomposed. Inorganic

waste is not given special treatment by the community, and does not go through a sorting process that distinguishes the disposal of organic and inorganic waste. The problem of plastic waste that is found in Kalaki beach tourism, it will potentially pollute the beach environment and its surroundings. Waste management methods with Reduce, Reuse, and Recycle, are carried out to lock plastic waste that is not degraded. Currently, there are many environmental activists who preserve nature by processing plastic waste. Currently, there is an effort to utilize plastic waste with a new method called ecobricking.

Based on the results of interviews, the community has not realized the importance of sorting organic and inorganic waste, especially plastic bottles, and there is no waste management that the community usually does with collection, transportation, processing and burning, or disposal of waste materials. The processing of inorganic waste into ecobricks as an alternative material for architectural elements is not yet popular in Bima City and is categorized as 'decorative crafts' by the community after the ecobricks education that resulted from this activity are chairs and tables made from non-organic waste by utilizing used plastic bottles and used plastic packaging around kalaki beach. The people of Bima City have very little knowledge in utilizing waste, especially plastic waste, they only know that plastic waste can only be recycled into pots and other decorations. Basically, ecobricking activities are not limited to making tables and chairs, but can be formed into other items or objects such as chairs and others based on needs and creativity. Ecobricking is a simple, capital-less, low-tech, plastic transition technology that can be done by anyone. Ecobricks take the form of a plastic bottle filled with a variety of plastic waste until it is full, solid and hard. By stuffing plastic waste into a plastic bottle, it keeps the plastic from degrading into toxins and microplastics. Ecobricks can be used as an alternative to bricks for building.

Ecobricking is one of the most creative ways to deal with plastic waste. Ecobricks serve not to destroy plastic waste, but to extend its life and turn it into something useful. Ecobricks can be used in the short and long term. For short-term use, ecobricks can be assembled into objects such as tables, simple chairs, towers, small stages, and more.

Making ecobricks isn't difficult, it just requires a little patience and effort. In general, the steps to making ecobricks are. 1). Collect used plastic bottles, such as used beverage bottles (for example mineral water), used cooking oil bottles and so on. Then wash them thoroughly and dry them. 2). Collect various kinds of plastic packaging, such as instant noodle packaging, beverage packaging, plastic wrap, plastic bags and so on. It must be ensured that these plastics are free of any food (remaining inside), dry and not mixed with other materials (clips, threads, paper and so on). 3). Put all the plastics in point 2 into the plastic bottles in point 1. 4). Do not mix with paper, glass, metal, sharp objects and other materials other than plastic. 5). The plastic materials put into the plastic bottles must be compacted until they are very dense and fill the entire space in the plastic bottles. 6). The method of compacting can be by using a tool made of bamboo or wood (such as a bamboo or wood stick). 7). If you want to make something with these ecobricks, such as a table, chair, or other object, you can use bottles of the same size, or even of the same type and brand, making it easier to build. To glue one bottle to another you can use glass glue/silicone glue.

The ecobricks that have been made combined into a chair and table can be used by the community as a seat and storage table around Kalki beach or in people's homes. An ecobrick must meet several criteria, namely that it is made using a transparent PET bottle, that it is packed only with used plastic that has been cleaned and dried, that it is sealed tightly with a screw cap, and that it has a density of 0.70 g/ml or less. There are a number of benefits to ecobricks, namely keeping plastic from becoming toxic, keeping plastic waste away from industrial processes that tend to drain energy or cause high emissions, reducing plastic waste, strengthening the economy if marketable, and empowering ecobrickers.

Government policy in overcoming the plastic waste problem in Bima

Currently, waste is an increasingly urgent problem in Indonesia. Considering that population growth is increasing every day, the waste produced by each citizen, especially plastic waste produced by each citizen, will increase and make problems regarding waste will accumulate and scatter. This is exacerbated by the lack of waste disposal sites and areas, the lack of public understanding of the benefits of plastic waste, and the reluctance of regions to reuse plastic waste, because both organic and inorganic waste are seen as something messy and must be disposed of. These different things lead to a decrease in climatic properties that adversely affect the local area. When we hear the term plastic waste or natural waste, what comes to our mind is a pile of waste that creates a very pungent foul-smelling aroma. Waste is defined as items or food scraps that are no longer used by humans, or are no longer used in an activity. Plastic waste

can have a devastating impact on human health conditions. various impacts, both on health and the environment. Serious piles of waste in the environment can cause various diseases. Waste that is not managed properly and correctly will have an impact on the surrounding community. Waste management is the collection, transportation, processing and recycling, or disposal of waste materials. Waste management must be carried out based on what is regulated in the Bima City Regional Regulation for both the government and local residents, in order to create a clean and healthy environment. "Waste is a common problem, not just a government problem, and the community should also be aware of protecting the environment around them and improving the pattern of the community itself," added Mr. Sahrul as a Bima City environmental service worker. The government has repeatedly cleaned up around Kalaki Beach, but still the community is not aware of the existing garbage problems, the community should also take part there, because the role of the Government or the Environmental Service is not full there alone, the environmental service has cleaned up many times and even put up banners or appeals and invitations to make people aware of environmental cleanliness and not long ago the banners disappeared somewhere and people never realized that they would dispose of garbage properly. The community should also have breakthroughs in overcoming the existing waste problems, and because those who throw garbage there are not only tourists but the people around the neighborhood also contribute to throwing garbage generated from their homes.

Regulations regarding waste management in Indonesia have been regulated by Law No. 18 of 2008 concerning Waste Management, Government Regulation No. 81 of 2012 concerning Management of Household Waste and Waste Similar to Household Waste, Regulation of the Minister of Public Works and Public Housing No. 03 of 2013 concerning the Implementation of Waste Infrastructure and Facilities in Handling Household Waste and Waste Similar to Household Waste, as well as regulations of each region. Waste management is all activities carried out in handling waste from the time it is generated to its final disposal. Broadly speaking, activities in waste management include waste generation control, waste collection, transfer and transport, processing and final disposal. Meanwhile, according to Article 1 paragraph (1) of Law Number 18 of 2008 concerning Waste Management states that:

Article 1

(1) Waste is the residue of daily human activities and or from natural processes in solid form. Waste handling activities as referred to in Article 22 of Law of the Republic of Indonesia Number 18 of 2008 concerning Waste Management include:

sorting in the form of grouping and separating waste according to the type, amount, and or nature of the waste;

collection in the form of collection and transfer of waste from waste sources to temporary shelters or integrated waste processing sites

transportation in the form of carrying waste from the source and or from temporary waste storage or from integrated waste processing sites to the final processing site;

processing in the form of changing the characteristics, composition, and amount of waste;

final processing of waste in the form of returning waste and or residues from previous processing to environmental media safely.

Sources of waste according to Law Number 18 of 2008 article 2 paragraph (2) and paragraph (3) states that:

Article 2

letter a comes from daily activities in the household, excluding feces and specific waste.

Household waste as referred to in paragraph

Waste similar to household waste as referred to in paragraph (1) letter b comes from commercial areas, industrial areas, special areas, social facilities, public facilities, and/or other facilities.

several regional regulations that have been formed by the local government of Bima City

BIMA CITY REGIONAL REGULATION NUMBER 3 OF 2018 CONCERNING WASTE MANAGEMENT

Article 6

The local government plans for waste reduction and handling as outlined in the strategic plan and annual work plan of the PD implementing waste affairs.

The target of reducing waste disposed to landfill as stated in the strategic plan and annual work plan in paragraph (1) through :

provision of facilities and infrastructure for environmentally friendly waste reduction and handling from the source of waste to the landfill; and
development of community participation in environmentally friendly waste management including financing and technology.

Article 7

Local governments in reducing waste are carried out by limiting waste generation, recycling waste, and/or reusing waste.
Waste reduction as referred to in paragraph (1) is carried out through activities:
monitoring and supervising the implementation of plans for the utilization of environmentally friendly production materials by business actors; and facilitating the community and the business world in developing and developing environmentally friendly production materials.
utilizing recycled products, marketing recycled products, recycling waste.

Increasing the Awareness of the People of Bima City of the Dangers of Plastic Waste in the Environment

Based on observations, people have not realized the importance of sorting organic and inorganic waste, especially plastic bottles. Processing inorganic waste into Ecobrik crafts as an alternative material for architectural elements is not yet popular in the community of Bima City. In general, the community in managing waste still relies on the final approach, namely garbage is collected, transported, and disposed of to the final waste processing site or burned, so that waste piles can be decomposed through natural processes, it takes a long period of time and requires handling at a large cost. The role of the community here is very important to protect the environment and the beach area so that it is not polluted by plastic and other waste. because the beach is a place for marine habitats to live. Environmental pollution from waste is usually also from the unconscious factor of the people around the village who do not care about their own environment which results in many piles of organic and non-organic waste. Waste is all waste arising from human and animal activities, usually in the form of solids that are considered useless or unwanted anymore. Waste problems in every city in general include an increase in the volume of waste generation, but not accompanied by management funds, management systems, and public awareness of waste support.

"The large volume of garbage that continues to grow every day and the lack of landfills at the kalaki beach tourist spot cause abundant garbage problems," added Pak Ali as a kalaki beach tourist. The problem becomes more complicated because the garbage on Kalaki beach is not only garbage generated from tourists but also garbage sent from floods that stranded on the shoreline. The garbage found along the shoreline of Kalaki beach is mostly plastic bottles and food packaging that produce inorganic waste that is not easily decomposed. Inorganic waste is not given special treatment by the community or tourists, and does not go through a sorting process that distinguishes the disposal of organic and inorganic waste. The problems that exist are the lack of public awareness regarding plastic waste management and many of the people littering. The problem of plastic waste that is found in kalaki beach tourism, it will have the potential to pollute the surrounding environment and marine habitat.

Plastic is made from petro-chemicals. These chemicals are not suitable for ecology. Scientific studies show that these chemicals are toxic to humans, we know this when we smell plastic burning. Over time, as these chemicals leach into the soil, water and air, they are absorbed by plants and animals which will eventually be absorbed by humans too, causing birth defects, hormonal imbalances and cancer.

Plastic waste that is scattered, burned or dumped will produce toxic chemicals. Even the engineering of landfills (TPST) cannot be a good solution. Within ten years, or even a hundred years, these chemicals will eventually seep into the biosphere, affecting livestock and human life.

Ecobricks, provide a valuable intermediary step in this transition. Something has shifted here. Used plastic waste was previously only cared for or handled by certain people. But now through ecobricking, more people, groups, are becoming interested in working with plastic waste, especially that used in everyday life. These workshops have resulted in the art of chairs, garden fences, tables, and more.

Most importantly, people are starting to understand why we need to ecobrick. What is the basis and philosophy behind doing this hard work? A more comprehensive knowledge of plastic, the facts of plastic production, the problems of recycling, the dangers of doing the wrong thing with plastic, the impact to the environment if not aware of what will happen over a period of time, how we need to change our lifestyle and our consumption behavior, and what we can do with the plastic or waste used and even make them part of the solution.

It's not just about managing the plastic that we continue to consume, it's not just about aspiring to build or shape something with ecobricks, it's about reducing plastic consumption and not using it as much as possible. And it's about building awareness en masse, becoming a community movement across all lines and channels, because ecobricking doesn't require any special skills, can be done at any time, and done together or alone while doing other daily activities, while killing time.

There is a realization that there are some packs that are very difficult to work with, and difficult to ecobrick, while ecobricks have so far been the only solution to trapping plastic in the environment. That's right, just ecobricking as a habit, an awareness of plastic consumption and the need to protect the environment from plastic toxins. Meanwhile, entrusting trash bins, garbage trucks, garbage cans, will not affect anything, in fact it will end up more horrible.

CONCLUSION

Plastic is a waste that is very difficult to break down naturally, so it has been a dilemma for many years. Scientists, ecologists and environmentalists have tried in various ways to tackle the problem of plastic waste. People who still do not care about the dangers of plastic waste, the community also does not know much that plastic waste can be turned into valuable crafts that can generate monetary value, the community only knows that plastic bottle waste can only be decomposed into flower pots. Ecobricking is one of the most creative ways to deal with plastic waste. Its function is not to destroy plastic waste, but to extend the life of the plastic and turn it into something useful, which can be used for the benefit of humans in general. Ecobricking is still not very popular among the general public. Most people still treat used plastic as household plastic waste, littering the environment, rivers and polluting daily life without any self-awareness.For this reason, there is a need for socialization, especially among school students or the wider community, which is more intensive regarding efforts to creatively process plastic waste. Starting from household plastic waste. With a little effort, one important problem will be unraveled little by little.

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