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Eco-Brick-Making Workshop for Cianjur Disaster Survivors

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Abstract

The earthquake that rocked Cianjur on November 21 2022 with a magnitude of 5.6 caused around 58,000 residents to be forced to flee. The large number of evacuees and volunteers has caused a pile of garbage at the evacuation site. Seeing this fact, the Faculty of Psychology, Jayabaya University, in collaboration with Putra Indonesia Cianjur University, took the initiative to provide education and training in making eco-brick from used plastic drink bottles. Eco-brick is an easy and inexpensive way to reduce plastic waste that is difficult to decompose. The activity was carried out at MTSN 6 Cianjur on December 28, 2022. From this training, it is hoped that the community will have the ability to utilize waste bottled drinks in goods that have high economic value. Eco-bricks can be used as chairs, tables and even building additives. This activity is also a form of application of environmental psychology as a branch of psychology that studies the interrelationships between individuals and the physical environment, both the natural environment and the human-built environment; set an example and increase public awareness and concern to always maintain the cleanliness of the surrounding environment under any circumstances.

Keywords: Eco-brick, Environmental Psychology, Disaster Survivors, Cianjur Earthquake.

INTRODUCTION

On November 21, 2022, Cianjur went viral, this was due to an earthquake that shook with a magnitude of 5.6 in the area. Apart from the fatalities, there were around 58,000 refugees scattered around the earthquake area. If a major disaster such as the Cianjur earthquake occurs, of course, there will be temporary relocation of residence and meeting the needs of food and drink for the victims, food, and beverage clothing assistance provided by the government, the private sector, and the people of Indonesia. This stage according to Andriani, et al. (2023) is referred to as the post-impact phase, where repairs and healing begin to be carried out from the emergency phase and the stage where people start trying to return to normal community functions.

In this post-impact phase, victims will experience stages of psychological response, starting from rejection, anger, bargaining, and depression to acceptance (Andriani, et al., 2023). This experience becomes external pressure which is felt as adversity (suffering) by the victims. Victims must try to get out of this situation and prepare valuable resources to be able to move forward and focus on things that can be controlled (Jackson and Watkin in Nasution, 2011).

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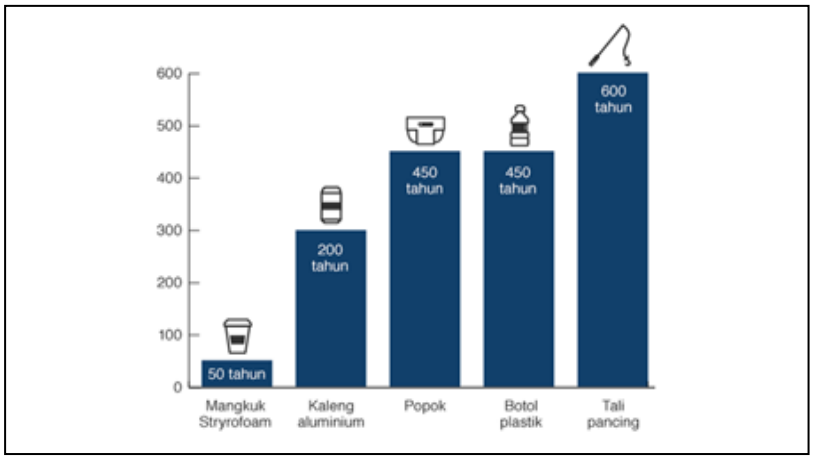
The gathering of the refugees in the locations that have been prepared, of course, is also followed by the arrival of volunteers who will assist the refugees. If we pay close attention, there are side effects that appear in refugee camps. Among them, you can see a lot of garbage that has started to fill the evacuation sites. Starting from food waste, plastic bottle waste, and other waste. If this is allowed to continue, it will become a new disaster that threatens the lives of the survivors who are trying to survive during the emergency response period.

Currently, waste is a severe environmental problem worldwide and is part of the results of everyday human activities. Household waste production has increased dramatically (Pakpour, et. al., in Steg, 2019). The environmental impact due to the accumulation of harmful waste is so severe in developing countries. Garbage collection occurs irregularly. Where available, inadequate waste disposal facilities are available, and waste is often disposed of untreated in landfills. Recycling can help reduce waste problems and conserve natural resources. However, recycling is rare and often insufficiently regulated by local authorities; whereas, it is very important to involve the household in recycling (Steg, 2019).

Among the most threatening waste is plastic waste. Plastic waste is a type of waste that is difficult to decompose biologically (non-biodegradable). Plastic is a material that can be recycled through many processing methods. The characteristic of plastic is that it is difficult to degrade or decompose so it takes hundreds to thousands of years to decompose it (Widodo, et al., 2018). Non-biodegradable plastic waste is a major waste problem. Plastic bag waste, which is very much needed by society, requires decomposition within tens or even hundreds of years (Wardani & Khotimah, 2021). Plastic waste that is difficult to decompose by bacteria is the main problem of soil pollution. (Shakir et al., 2013). The following data illustrates the estimated time for waste to decompose naturally:



Source: NOAA (dalam BBC News Services, 2017)

Figure 1. Estimated time for waste to decompose naturally

Natural disasters occur disproportionately in LMIC (low-and-middle-income countries/low- and middle-income countries) (CRED in Steg, 2017). Often low- and middle-income countries suffer the most severe consequences with unparalleled death rates and livelihoods destroyed whenever there is a disaster (Steg, 2019). Therefore, a better understanding of perceptions of environmental risk is very important because it influences risk readiness and adaptation (Ainuddin, et al., in Steg,

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2019). Nevertheless, most of the studies on environmental risk perception target high-income countries.

Considering this, the authors who took part in the post-earthquake volunteer work in Cianjur intended to educate earthquake survivors in the form of Eco-brick training. In the workshop, what will be changed is the behavior of the survivors to be more environmentally friendly by equipping them with the skills to make Eco-bricks. Behavior is an attitude born as a result of interaction between humans and the environment (Tantiwat et al., 2021). Community behavior can affect environmental conditions, one of the factors that influence waste management behavior is the level of public education and knowledge about regional regulations regarding waste (Fauzi et al., 2020).

This community service program is designed to introduce and teach knowledge and skills to teach staff and employees at MTSN 6 Cianjur who are also survivors of the Cianjur earthquake as an effort to change plastic waste management behavior. Similar to the results of this activity from Community Service activities carried out by a team from the UPI University for Teachers at SDIT Al Multazam, Kuningan District (Hamdu, et.al., 2023), after attending the training, participants are expected to be able to disseminate their knowledge to people in need. The activity will be relevant to be able to foster and assist teachers in increasing competence in certain skills within a certain time. Community Service Activity held by 'Aisyiyah Bandung University (Rahmat, 2023), found that mentoring activities carried out by the Community Service team provided increased knowledge for the participants, and also had a good impact on the knowledge and attitudes about awareness of the use of masks from Baiturahhman students after they watched the video from the Busur Creative Community. Whereas the Community Service Activities held by Pondagitana, and Agustina (2022), showed an increase in the knowledge of parents and teachers before being given assistance and after being given assistance which was evident from the increase in scores. Thus, it is hoped that the same results will affect this eco-brick-making workshop.

Eco-brick is one of the innovations in the world of construction that utilizes plastic waste. Eco-brick uses Polyethylene terephthalate (PET) bottles which are known as a plastic material that is widely used as packaging for mineral water and soft drinks. Making PET bottle contents into eco-brick varies greatly from sand to brick to plastic (Ariyani et.al., 2020). However, to maximize plastic waste management, many people choose to fill PET bottles with plastic waste (Antico et al., 2017). Eco-brick using plastic waste can use household plastic waste such as plastic bags, detergent packaging, instant food, and the like (www.Eco-brick.org, 2016). Eco-brick is an innovation and solution in efforts to process plastic waste. Eco-brick comes from the words eco and brick which are intended as alternative bricks that are environmentally friendly, eco-brick has advantages in the basic properties of the plastic itself, which is strong and durable.

Based on the previous explanation, the objectives of this workshop are: (1) To avoid environmental disasters due to plastic waste; (2) to change the behavior of plastic waste management by providing knowledge about how to process it; (3) to introduce and teaching eco-brick-making skills; (4) Providing post-earthquake activities as an effort to reduce stress caused by the earthquake; (5) Empower (economically) the survivors who lost their livelihoods due to the earthquake.

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METHOD

The activities offered by this PkM are socialization, mentoring, and workshop activities related to post-earthquake disaster management for communities around Cianjur District. Community Service activities were carried out in the form of workshops on December 28, 2022, at MTSN 6 Cianjur with 32 participants. Participants consisted of teaching staff and employees at MTSN 6 Cianjur who were also survivors of the Cianjur earthquake. The method used is the Lecture and Practice method. The lecture method uses audio-visual media in the form of material PowerPoint presentations and video simulations. The practice involves all participants. Practical equipment is provided by community service executors, namely the collaboration of the Faculty of Psychology, Jayabaya University, and Putra Indonesia University.

The workshop implementation flow chart can be seen in Figure 1.

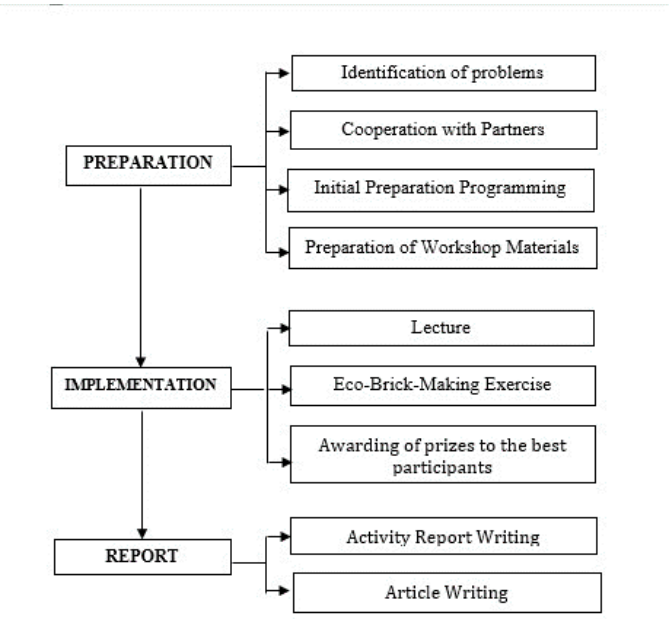

Figure 2. Activity Implementation Flow Chart

Before the implementation of the eco-brick-making workshop activities, the initial steps (Preparatory Stage) were carried out as follows:

- Problem Identification: Collecting data and information before the implementation of activities, to get an overview of the problems and needs of workshop activities. At this stage data collection was also carried out on the need for tools and supports for making eco-bricks.
- Collaboration with partners: Coordinating with related parties regarding the schedule for implementing waste management workshops and Eco-brick manufacturing workshops.
- Initial Preparation: Preparing tools and materials for the eco-brick-making workshop, including 600 ml used mineral water bottles, used plastic waste, glue guns, and wooden sticks.
- Preparation of Materials: Prepare workshop materials in the form of written materials in PowerPoint format.

After the preparation stage, the activity enters the implementation stage as follows:

- Lectures. The workshop begins with giving material about eco-brick. Introduction and how to

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make a lecture method assisted by PowerPoint.

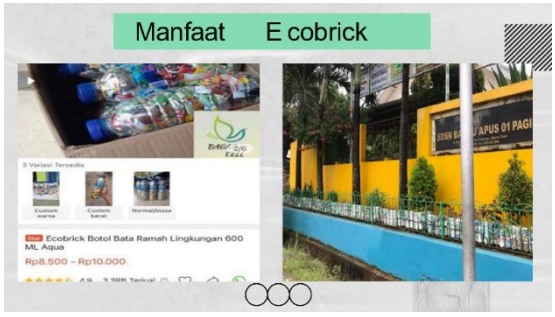
- Practice Making Eco-brick. After being given the material on eco-bricks, the participants were given practice on making eco-bricks.
- Giving prizes to the best participants. Participants who show the best workshop results are given prizes. The purpose of giving gifts is also to entertain participants who are survivors of the Cianjur earthquake.

The next stage is the reporting stage. Reports are prepared in two forms. one activity report for the university and funders, and one report in the form of an article to be published in the Journal.

RESULT AND DISCUSSION

The activity was carried out based on the agreement of the school where staff members were victims of the earthquake that occurred in Cianjur in November 2022. The workshop took place on December 28 2022 at MTSN 6 Cianjur with 32 participants who became earthquake survivors. The method used is the Lecture and Practice method. The lecture method uses audio-visual media in the form of material PowerPoint presentations and video simulations. The practice involves all participants. Practical equipment is provided by community service executors, namely the collaboration of the Faculty of Psychology, Jayabaya University, and Putra Indonesia University.

The following are samples of lecture materials about eco-brick:



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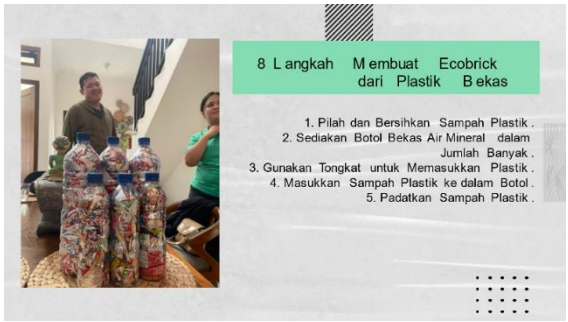

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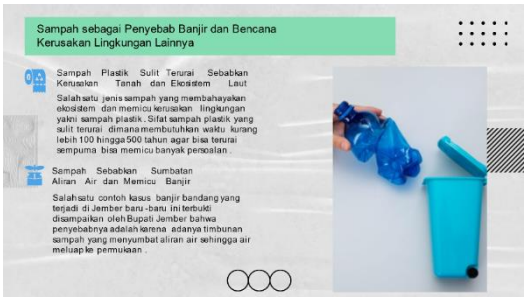

e

Figure 3. a-e. Sample of Eco-brick-making Lecture Powerpoint Material

The following are the steps taught as workshop materials for making eco-bricks from used plastic:

- Sorting and cleaning plastic waste as stuffing for plastic bottles that must be available in making eco-bricks. Types of plastic waste that can vary such as food wrappers and used plastic bags. Wash clean plastic waste for charging use. Then dry it in the sun to dry.
- Prepare a 600 ml used mineral water bottle, the bottle is dry and clean.
- First, provide a stick or bottle-filling pusher that is long enough to push it to the bottom of the bottle so that the plastic waste is solid in the bottle.
- Put the stuffing plastic waste into the bottle, so that it looks like it has a colorful pattern, and insert the plastic randomly. Fill the bottle with plastic waste until all parts of the bottle are full and solid.
- If there is still air space left in the bottle, push and press the stick that has been prepared so that the solid stuffing is in the bottle.
- Apply enough glue to the inside of the bottle cap, then close it tightly.
- Carry out the weighing process for each eco-brick that has been made, generally each bottle that has been filled with plastic waste has a standard of 200 grams per 600ml bottle of mineral water.
- Store the eco-brick in a place protected from direct sunlight so that the eco-brick's plastic bottles do not change in texture and size.

Documentation of the implementation of the workshop can be seen through the following photos:

Figure 4. Education on making eco-bricks delivered by Lelly Anggraeni. S. Psi.

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Figure 5. The practice of making eco-bricks

Figure 6. Participants practice making eco-bricks

Figure 7. The completed eco-brick

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Figure 8. Photo of participants in an eco-brick-making workshop

Figure 9. Group photo of educators and MTSN 6 Cianjur staff

CONCLUSION

The provision of eco-brick workshops to the survivors of the Cianjur earthquake was given to provide useful activities for the survivors. This activity can be a therapeutic effort to reduce stress caused by the earthquake, as well as provision for economic empowerment. This activity needs to be expanded so that the people in the Cianjur area understand the benefits, both in terms of environmental cleanliness and protecting the environment by turning plastic bottle waste into a commodity that has high economic value.

The local government can provide trash cans that can sort out the types of waste. The a need for education of the public to create awareness within them to process the waste generated independently, so that awareness arises to maintain the beauty of the environment while preventing the negative impacts of waste which can have an impact on health.

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