



Assistance in Processing Household Plastic Waste into Ecobricks at Medas Harmony Housing, West Lombok

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Abstract: Household waste contributes to the volume of waste. In general, household waste is easily biodegradable and difficult to decompose. Household products that are hard to decompose are generally plastic and plastic bottles predominantly. The difficulty of decomposing household plastic waste requires serious handling, so it is necessary to provide assistance for processing plastic waste into useful creations. One of them becomes ecobric. There are two methods of this activity, namely direct counseling and training. The results obtained after the community service activities were completed was that they were able to improve community skills in processing plastic waste into ecobrics. Furthermore, ecobrics are created into potted plants and other forms of creation. In addition, after this activity is carried out, it can reduce the movement of plastic waste to the final disposal site (TPA), so that the community hopes that this activity will continue to be transmitted to other places to create a clean and free environment from plastic waste.

Introduction

Until now, the waste problem has not been resolved, various methods and programs have been implemented but have not been able to overcome the waste problem. This happens because the production of waste has not been balanced with the handling carried out so that waste is everywhere. The Ministry of Environment and Forestry stated that the amount of waste piled up nationally is 175,000 tons/day or the equivalent of 64 million tons per year if using the assumption that the waste generated per person per day is 0.7 kg. This amount of waste comes from household waste¹.

¹ I Gusti Agung Ayu Yuliartika Dewi, "Peran Generasi Milenial Dalam Pengelolaan Sampah Plastik Di Desa Penatih Dangin Puri Kecamatan Denpasar Timur Kota Denpasar," *Public Inspiration : Jurnal Administrasi Publik* (2018).



Plastic waste originating from households has various forms so that it needs initial treatment such as separation between organic and inorganic waste. Garbage segregation is a very easy job and requires the awareness of each household. If this is ignored, then dry plastic waste will be mixed with other types of waste so that it becomes wet and dirty. Household waste generated daily reaches 1.46 liters/person/day, consisting of 22% plastic waste, the remaining 47% organic waste, 15% paper waste, and 16% metal and other waste².

Plastic waste that is not handled properly can cause big problems for Indonesia because it is difficult to decompose and can pollute the soil³. In addition to polluting the soil, this untreated plastic waste also has an impact on health, the environment, and socio-economics⁴. Therefore, seeing the negative impacts caused, it is very necessary to do proper, effective and efficient handling.

So far, some of the handling that has been carried out, among others, the waste generated is temporarily accommodated, then taken to the final disposal site. This cannot be said to be effective due to the fact that occurs in the field that the waste collected in temporary storage causes many problems such as strong odors, scattered by animals and so on. In addition, the community also handles the problem of waste by burning it directly, but this method is also very harmful to the environment because it contributes to smoke that causes the ozone layer to be damaged. In addition, the importance of this mentoring activity is based on the data obtained that the volume of waste, especially plastic waste, has a volume of 30% compared to other waste. So that the bad habits of the community need to be educated, one of which is by making Ecobricks.

² R Riswan, Henna Rya Sunoko, and Agus Hadiyarto, "PENGELOLAAN SAMPAH RUMAH TANGGA DI KECAMATAN DAHA SELATAN," *Jurnal Ilmu Lingkungan* (2012).

³ Ririn Setyowati and Surahma Asti Mulasari, "Pengetahuan Dan Perilaku Ibu Rumah Tangga Dalam Pengelolaan Sampah Plastik The Level of Housewife 's Knowledge and Behavior in Managing Plastic Waste," *Jurnal Kesehatan Masyarakat Nasional* (2013).

⁴ Surahma Asti Mulasari, Adi Heru Husodo, and Noeng Muhamadir, "Kebijakan Pemerintah Dalam Pengelolaan Sampah Domestik Government Policy in Domestic Waste Management," *Jurnal Kesehatan Masyarakat Nasional* (2014).

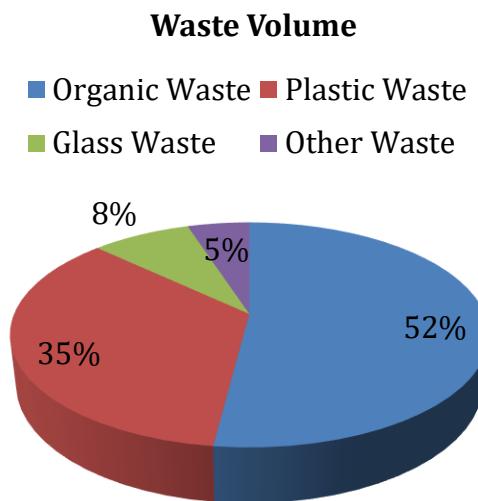


Figure 1. Average volume of waste per month at Medas Harmony Housing

The results of a simple analysis that waste handling is a very easy and simple way, starting from small things, namely household actors. Every household with its own awareness can help with the waste problem by sorting it first before it is mixed with other types of waste. This method of handling, in addition to getting clean and dry plastic waste, also gets organic waste. Handling organic waste is much easier than other types of waste because organic waste is not managed very easily and quickly decomposes back into soil.

In a study conducted on the magnitude of the decrease in the volume of waste carried out by scavengers. In this study, the results showed that scavengers every day were able to reduce by 80% of plastic waste every day for one scavenger⁵. The results of this study are proof that an effective way of handling waste is to separate the types of plastic waste from other wastes. In another study, it was also said that plastic waste can be used as an additional material for making paving⁶. Ecobricks have the advantage of being able to accommodate a large volume of plastic waste due to the reduced size and compacted in plastic. The purpose of the mentoring activity is to reduce the volume of household plastic waste by utilizing it into Ecobricks.

Methods

In achieving the target of mentoring, the implementing team applied participatory research methods, through counseling, practice, and evaluation.

⁵ Syarfaini, Munawir Amansyah, and Khairunnisa, "Pengaruh Pelatihan Pengelolaan Sampah Terhadap Penurunan Volume Sampah Di Lingkungan Balleang Kabupaten Bulukumba," *Journal of Higiene* (2010).

⁶ Muhammad Erfan, Nenny Roostianawaty, and Sriliani Surbakti, "Pendampingan Pemanfaatan Limbah Botol Plastik Sebagai Bahan Tambahan Paving Di Kelurahan Arjowinangun Kecamatan Kedungkandang Kota Malang," *SONDIR* (2021).



First, counseling. The counseling material was delivered by the activity implementing team, namely the lecturer of the Faculty of Agriculture, Muhammadiyah University of Mataram. The material is delivered using slides and live video presentations to facilitate public understanding. Counseling aims as a moment of discussion between the implementing team and the community that household waste if wasted into the environment can cause pollution so that the community needs assistance to increase knowledge that the plastic waste produced has the potential to be made into ecobricks and other creations.

Second, training. The second stage is direct practice by participants accompanied by the implementation team. To facilitate this activity, it is necessary to separate the plastic waste from being dirty or wet. It is hoped that after this activity is carried out it can increase the knowledge and skills of the community.

The tools and materials used in the practice of processing plastic waste into ecobricks are scissors to cut plastic, and 60 cm sticks of wood to push and compact the cut plastic into plastic bottles. Furthermore, the resulting ecobricks are created as hedges and flower pots.

Third, evaluation. Activities that have been carried out are evaluated using a questionnaire to obtain accurate information on the success of the service activities carried out. The questionnaire was filled in directly by the activity participants after 2 weeks of the activity being carried out. This is done to make it easier for participants to give an assessment of the activities that have been carried out. The following is a flow diagram of the service activities carried out, which can be seen in Figure 2.

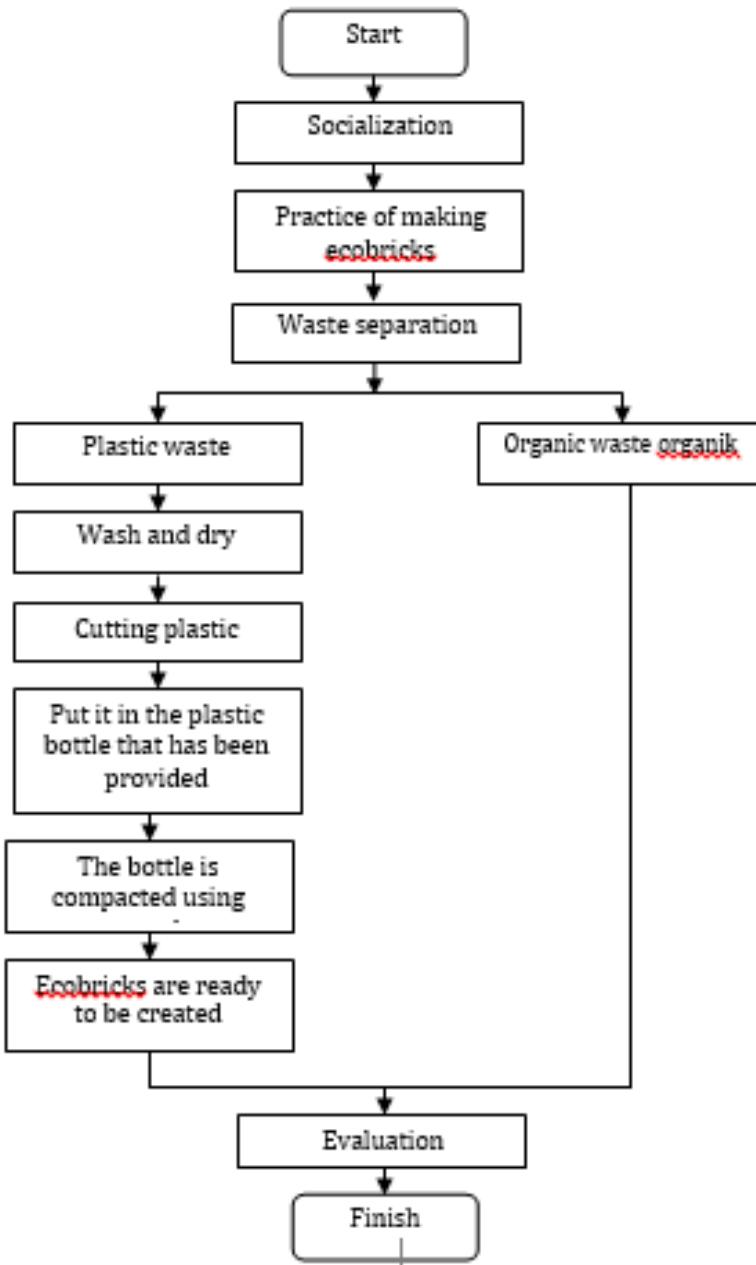


Figure2. Flowchart of service activities

Results

Counseling and Practice Making Ecobricks

The counseling activity was carried out in March 2021. This counseling activity was attended by 32 participants consisting of housewives, fathers and also children. Even though this activity was carried out in the midst of the COVID-19 pandemic, health protocols were still used, such as wearing masks and washing hands.

During the activity the participants looked very enthusiastic. This is evident from the number of participants who asked about the creation of economic value plastic waste.

Because the material presented is not only about processing plastic waste into ecobricks but other preparations to attract the public in handling waste.

In this counseling, one of the participants also stated that the main obstacle in processing this plastic waste is the initial separation from other types of waste to get dry and clean waste. So this problem needs to be done slowly and with self-awareness, because if not then the garbage that has been mixed with other types of waste will cause unpleasant odors and aromas.

Based on a study conducted by Ibrahim et al⁷ that waste sorting is done by creating a waste bank. Sorting in this way is able to reduce the pile of waste by 66.684% of the total pile of garbage in Panarung Village.

The same thing was conveyed at the outreach activity that for waste sorting, rules are needed that require all people to participate, one of which is by making a waste bank to make a rule that people who dispose of waste are subject to sanctions. The following is the documentation of the extension activities carried out, which can be seen in Figure 3.



Figure 3. Extension activities on processing plastic waste into ecobricks

The results of the counseling phase provide an overview for the community to process plastic waste into ecobricks and their use. The results of the evaluation at this stage indicate that the community's obstacle is the separation between plastic and organic waste such as vegetable scraps and other types of waste. This happens because people tend to mix wet plastic with dry plastic such as plastic.

Handling plastic waste that is popular so far is with 3R (Reuse, Reduce, Recycle). Reuse is the repeated use of items made of plastic. Reduce is reducing the purchase or use of goods made of plastic, especially single-use items. Recycle is recycling items made of plastic. This method is still said to be less effective to be applied in waste management, especially plastic waste⁸. So the most effective idea is to turn plastic waste into ecobricks.

⁷Ibrahim Sanusi, Hendra Cahyadi, and Rida Respati, "Analisis Pemilahan Persampahan Berskala Individual Rumah Tangga (Studi Kasus Kelurahan Panarung, Kecamatan Pahandut, Kota Palangka Raya, Kalimantan Tengah)," *Media Ilmiah Teknik Lingkungan* (2016).

⁸ Ibadur Rahman et al., "PENGELOLAAN SAMPAH PLASTIK MENJADI EKOBRIK UNTUK MENEKAN LAJU PENCEMARAN SAMPAH MIKROPLASTIK YANG MENGANCAM KELANGSUNGAN HIDUP BIOTA PERAIRAN TELUK BUMBANG, KABUPATEN LOMBOK TENGAH," *Indonesian Journal of Fisheries Community Empowerment* (2021).

Ecobricks are one way of handling waste by not sending it to the TPA or waste incineration room⁹. However, plastic waste is cut into small pieces and then put into plastic bottles. In the manufacture of waste that is put into bottles requires the help of wood so that the plastic that has been cut becomes compressed so that the bottle becomes solid and hard after being pressed. The garbage that is put into the bottle is safer and has the potential to be created into other forms, as was done in the Medas Gunung Sari Hamlet.

The ecobricks creations resulted from this activity by making flower pots and hedges, these two things were made with the aim of cultivating plants in the yard and to protect plants from animal disturbances. The resulting flower pots are round and rectangular, making them attractive to hang or place on the home page. The resulting pot does not need to be painted again because it has given rise to the colors of the plastic that is inserted into the bottle.

Making ecobricks goes very smoothly, because basically the practice of making ecobricks is very easy and simple. The resulting ecobricks also vary depending on the creations of each participant and also the existing waste materials. The following is the documentation of making ecobricks carried out in the village of Medas, Gunung Sari.



Figure 4. The activity of making ecobricks from plastic waste and plastic bottles

Evaluation

Evaluation is carried out at the end of the activity to ensure the success rate of the mentoring activity. This evaluation is filled by community groups who are involved in mentoring activities from the beginning to the end of the activity. The distribution or filling is carried out in two stages, namely at the beginning before the activity is carried out and the second stage, namely after the activity is completed. The results of the analysis of increasing community knowledge and skills can be seen in Figure 5 below.

⁹ Siti Rohana Nasution et al., "IbM: PEMANFAATAN LIMBAH PLASTIK SEBAGAI KERAJINAN TANGAN DI KELURAHAN SRENGSENG SAWAH JAGAKARSA JAKARTA SELATAN," *Jurnal Ilmiah Teknik Industri* (2019).

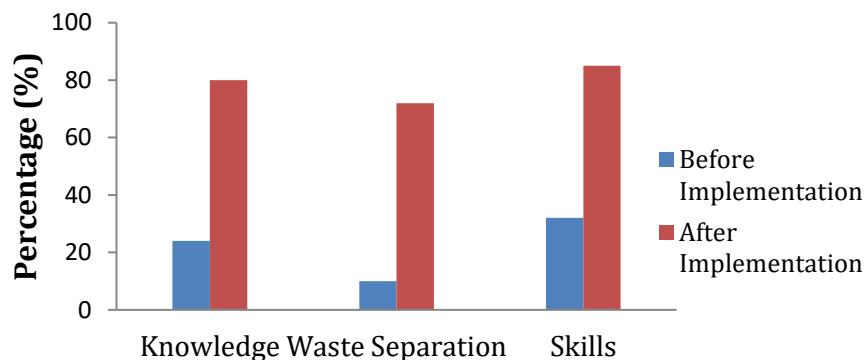


Figure 5. Graphics of increasing knowledge and skills of the mentoring community.

Based on Figure 5, it can be seen that there was an increase both in terms of knowledge and skills. So it can be concluded that household plastic waste processing activities have a high appeal in the community. It can be seen that 80% of the community is satisfied with the activities carried out, and the community hopes that this activity can be carried out regularly for other waste processing into useful creations and can be commercialized. Innovative plastic waste processing can create new jobs¹⁰. In addition, it can also reduce the volume of waste to the Final Disposal Site¹¹. As for suggestions and input from participants that mentoring activities need to be carried out continuously and sustainably, so that more and more diverse plastic waste creations can be created.

Conclusion

Based on the results and discussion, the following conclusions can be drawn: (1) It can improve the knowledge and skills of the community in making ecobricks made from plastic waste; (2) after the mentoring activity was carried out, it was found that there was a physical change, namely the environment became cleaner and non-physically that there was public awareness that waste processing needed to be done to maintain environmental cleanliness.

Acknowledgments

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¹⁰ Zulfan Arico and Sri Jayanthi, "Pengolahan Limbah Plastik Menjadi Produk Kreatif Sebagai Peningkatan Ekonomi Masyarakat Pesisir," *Martabe : Jurnal Pengabdian Kepada Masyarakat* (2018).

¹¹ Aisyah Tulfitri and Emma Lilanti, "Pemanfaatan Limbah Rumah Tangga (Kantong Plastik Dan Botol)," *J-ABDIPAMAS (Jurnal Pengabdian Kepada Masyarakat)* (2020).



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