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Socialization of Diaper Waste Composting for the Bojong Indah Parung Community, Bogor District

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ABSTRACT

Diaper waste is one of the wastes that is difficult to decompose by soil microbes. The decomposition process takes up to hundreds of years. The large amount of diaper waste that is disposed of carelessly can have a negative impact on the environment. Diaper waste can be used to make useful products. The absorbent gel can be used as plant fertilizer. The gel is very good at absorbing water so that it can retain soil moisture and become a nutrient for plants. However, not many people know the impact of diaper waste and do not know that diaper waste can be made into useful products. There needs to be knowledge about the negative impacts of diaper waste that can pollute the environment. Then continued with the socialization of diaper waste management into plant fertilizer for residents of RT 01/ RW 02 Bojong Indah Village, Parung District, Bogor Regency. The implementation method used is to provide socialization and provide guidance on the stages of processing diaper waste into plant fertilizer.

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INTRODUCTION

Waste is one of the environmental problems that until now has not been handled properly, especially in developing countries, while the ability of waste managers to handle waste is not balanced with its production. The amount of waste is increasing along with the amount of waste generated from human activities which becomes a source of disease if it continues to accumulate without efforts to reduce the amount of waste. Not only has an impact on health but also on various sides of life (Husnul Khotimah, et al., 2023). Waste that is not managed and utilized can be a big problem, but on the one hand, if it can be managed properly, waste can bring blessings and benefits to society in realizing a circular economy (Yuliati, et al., 2024). In the World Bank report in 2017 by Mongabay, it was stated that disposable diapers contributed as the second largest contributor of waste after plastic at 44%, disposable diapers 22%, plastic bags or plastic 16%, other waste 9%, plastic wrappers 5%, glass and metal 4% and plastic bottles 1%. Diaper waste, or disposable diapers, contributed the second largest waste because it was the most in demand by mothers in Indonesia with a presentation of 95.2%. The estimated use of baby diapers is at least 6 diapers a day, meaning an estimate of 86 million used disposable diapers are thrown away every day. Diaper waste is included in the category of waste that is difficult to dispose of and is included in inorganic waste because its condition is wet and consists of various components that are not easily burned to be destroyed so it is very difficult to manage. Rapid population growth has increased the demand for disposable baby diapers, which has a considerable environmental impact (Mulia, 2024).

Based on Law no. 18 of 2008, the responsibility for managing household waste and household-like waste lies with all elements of society, while the management itself can include activities to limit landfills, recycle, and reuse waste into useful products and reduce the volume of waste landfills. There needs to be management of diapers, sanitary napkins, and other household waste that is not environmentally friendly (Jonathan, 2024). Diapers are a medium or equipment for accommodating metabolic waste such as urine and feces which are composed of plastic and various other chemicals (NS, 2017). Diapers are made of Polyacrylate polymers in the form of sodium polyacrylate and Cellulose. Polyacrylate in the diaper industry is also known as Super Absorbent Polymer (Mustam & Aziz, 2022). In general, the composition of disposable diapers consists of 39% super absorbent polymer fiber, 23% standard fiber, 20% compressed fiber, 9% Polyethylene Terephthalate (PET) fiber, 4% binder fiber, 3% tissue fiber and 2% latex binder (G, T, B, & M, 2019). The ability of superabsorbent polymer to absorb water per gram of dry superabsorbent polymer reaches 189 g/g for 30 minutes. After 30 minutes the absorption capacity becomes flat due to water saturation in the Super Absorbent Polymer (SAP). This is acceptable in its application in the agricultural sector. (Ramdani, Mustam, Harun, & Setiawan, 2021).

The diaper material, which is often called SAP, is relatively safe for the environment because it is difficult to break down into its monomers. So in the diaper production process, toxic monomer materials are processed into complex polymer compounds to remove the dangerous elements in them and at the same time make them compounds that can absorb large amounts of water (Mestre Mobtserrat, L, & A, 2013). Diaper waste has many benefits that can be utilized, including for agriculture. The gel contained in the diapers can be used to store water. Diaper waste can be used as a growing medium because it has the advantages needed by plants (Pamurti & Prabowo, 2023). In addition to having a hydrogel content that functions to retain water, baby diaper waste also has the advantage of having urine in it. Human urine contains three macronutrients, namely nitrogen, phosphorus and potassium. Among all the nutrients, the dominant one is nitrogen (Triastianti & Ayuningtyas, 2021). There are several factors that cause the accumulation of diaper waste, one of which is the lack of knowledge and skills of the community in managing and processing household waste, especially diaper waste. Starting from efforts to preserve the environment by reducing waste and waste, it is necessary to educate the public that diaper waste can

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actually be used as an alternative fertilizer or planting medium. Hydroponic technology using diaper waste has succeeded in making plants grow well and can be used as a means of education to care about the environment (Widiatningrum, Pukan, R Susanti, & Sukaesih, 2018). Diaper waste if left alone will pollute water and soil which are basic human needs, so good management is needed. With the management of diaper waste, it is also hoped that it will be an added value in improving community welfare (Mayangsari & Wahyuni, 2022), By implementing the processing of baby diaper waste into environmentally friendly organic fertilizer and planting media, it will help make fertilization of plants more effective (Kusumaningrum, et al., 2024).

METHODS

This community service program is a team that partners with the drivers of activities in Bojong Indah Village, Parung, Bogor Regency. The solution offered to the problems that occur is to provide education that diaper waste can be utilized as easily as possible in order to reduce waste production in the environment. The behavior of society which was previously “throwing away” waste, must be changed to “managing” waste (Willard, et al., 2024). This activity aims to increase knowledge and empower the community in processing waste, as well as to reduce the population of diaper waste in the Village Community of Bojong Indah into products that are more valuable for the community. This PKM is also integrated with the IKU of higher education. The IKU achievements obtained include IKU 1, namely students get experience outside the campus, IKU 3, namely lecturers do activities outside the campus, and IKU 5, namely the results of lecturers' work are used by the community. Community service education activities for processing diaper waste into plant fertilizer are carried out using the socialization method. The problem identification process is carried out through field surveys and coordination with residents of Bojong Indah Parung, Bogor Regency. The solutions offered are delivered in the form of delivering material in the form of education to the community. The partners involved are residents of RT 01/ RW 02, Bojong Indah Village, Parung District, Bogor Regency.

The activity method in community service is shown in Figure 1.

FIGURE 1. Flowchart of activity method

RESULT

The training on processing diaper waste into plant fertilizer was held on Saturday, August 31, 2024 by renting a classroom at SMK Muhammadiyah Parung. The distance between the institution and the partner location is approximately 12.3 km and takes 30 minutes. The figure below shows the distance between the institution and the partner.

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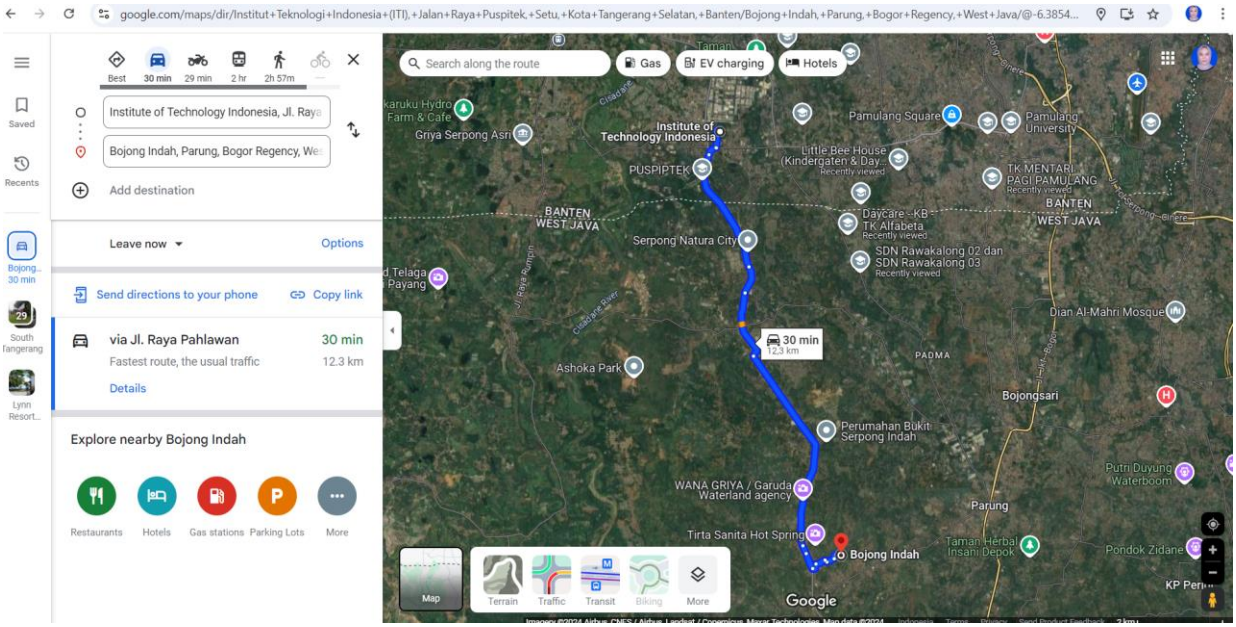

FIGURE 2. Distance to the socialization location

The participants who attended were residents of RT 01/ RW 02 Bojong Indah Village, Parung District, Bogor Regency. This event was attended by 15 participants and assisted by 12 students of the Vhadyaswasti architecture student organization. After the field survey and coordination stages with the RT were carried out, the next stage was the implementation stage. The implementation of the training on processing diaper waste into plant fertilizer began with the delivery of information regarding the impact of diaper waste on the environment. Starting from the idea of reducing diaper waste, a solution was proposed to process the diaper waste into a useful and economically valuable product. The next step is to prepare the tools and materials used for the training. The training was carried out face-to-face by providing an explanation to participants regarding the stages of processing diaper waste into plant fertilizer. The tools and materials used are shown in Table 1.

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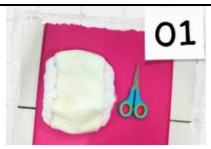
TABLE 1. Tools and Materials

No	Picture	Steps	Product poster
1		Prepare tools and materials in the form of scissors and also used diapers or nappies that contain urine.	
2		Take the silica gel from inside the used diapers by cutting the used diapers.	
3		Remove the gel from the diaper. Diapers contain ammonia from urine.	
4		Place and tidy up the contents of the diaper (Silica gel) on the planting medium to be used as fertilizer.	

The steps are loaded into a poster. The poster already has a registered copyright. All participants get the poster distributed by the team. The poster can be saved, and pasted in their homes so they can always remember the steps of composting diaper waste. The following is the situation and conditions under which the socialization activities are taking place.

FIGURE 2. Socialization activities

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CONCLUSION

The result of education and training on processing diaper waste into plant fertilizer is that residents of RT 01/ RW 02 Bojong Indah Village, Parung District, Bogor Regency. gained knowledge that diaper waste can be processed into plant fertilizer. Furthermore, residents of Village can follow the steps given by the community service team in processing diaper waste into plant fertilizer. Through this community service activity, it is hoped that residents of Bojong Indah, Parung, Bogor can also make plant fertilizer products from diaper waste which are then packaged and become UMKM products. With the implementation of community service related to the processing of baby diaper waste into environmentally friendly organic fertilizer and planting media, it will help to make fertilization of plants more effective. The presence of SAP content in baby diaper waste mixed with soil can also maintain water levels, thus maintaining the availability of water for plants during the dry season.

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REFERENCES

Husnul Khotimah, N. H., Mustika, M. S., Eko Dewi, D. W., Intan Yusita, Fatin, M. A., & Nuryesa, S. A. (2023). Implementation of Sustainable Development in Girimekar Village Through Health Education in Waste Managemen. *Abdimas Umtas: Jurnal Pengabdian Kepada MasyarakatLPPM-Universitas Muhammadiyah Tasikmalaya, 6*(1), 3256–3263. doi:https://doi.org/10.35568/abdimas.v6i1.3071

G, K., T, T., B, S., & M, N. (2019). Review on the Manufacturing and Properties of Nonwoven Superabsorbent Core Fabrics Used in Disposable Diapers. *International Journal of Chemical Sciences, 17*(1), 302-208.

Jonathan. (2024). *Analisis Pengelolaan Sampah Diapers dan Pembalut Sekali Pakai dalam Krisis Sampah Yogyakarta Menggunakan Teori Ekofeminis Rosemary Radford Ruethe.* 2024: Final Years Project UKDW.

Kusumaningrum, M., Cahya Imani, N. A., Wulansarie, R., Handayani, P. A., Hibatullah, R. D., Adhi Nanggala, P. L., . . . Nada, A. A. (2024). Mengubah Tantangan Menjadi Peluang Pengelolaan Limbah Popol Bayi Menjadi Pupuk Organik Unggulan. *Communnity Development Journal, 5*(1), 2504-2507.

Mayangsari, & Wahyuni. (2022). Community Participation in Diapers Waste Management. *UNEJ e-Prosiding*, (pp. 80-86). Jember.

Mestre Mobtserrat, C. J., L, P. V., & A, S. (2013). Performance of compostable baby used diapers in the composting process with the organic fraction of municipal solid waste. *Waste Management*, 1097-1103.

Mulia, M. F. (2024). *Analisis Emisi Co2 Produk Diapers Untuk Mengurangi Dampak Lingkungan Dengan Lca Dan Lean : Sebuah Studi Kasus.* Surabaya: Masters thesis, Institut Teknologi Sepuluh Nopember.

Mustam, R., & Aziz, H. A. (2022). Potensi Limbah Popok Bayi Sebagai Matriks Pengontrol Pelepasan Pupuk Urea Pada Tanaman Cabai. *EduMatSains : Jurnal Pendidikan, Matematika dan Sains, 7*(1), 1-10. doi:https://doi.org/10.33541/edumatsains.v7i

https://doi.org/10.35568/abdimas.v8i1.5461

NS, L. (2017). Gambaran Pemakaian Diapers Sekali Pakai Pada Anak Usia Pra sekolah. *Jurnal Photon, 7*(2), 47-52. doi: https://doi.org/10.37859/jp.v7i02.502

Pamurti, A. A., & Prabowo, D. (2023). Edukasi dan Pelatihan Pengolahan Limbah Diapers menjadi Pupuk Tanaman pada Warga Kelurahan Sendangguwo. *Jurnal Pengabdian KOLABORATIF, 1*(1), 64-69. doi:DOI: 10.26623/jpk.v1i1.5991

Ramdani, N., Mustam, M., Harun, A. P., & Setiawan, I. A. (2021). Peran Polimer Super Absorben Pada Popok Bayi dalam Mengontrol Kelembaban Tanag. *EduMatSains : Jurnal Pendidikan, Matematika Dan Sains,, 6*(1), 91-11. doi:https://doi.org/10.33541/edumatsains.v6i1.2991

Triastianti, P. F., & Ayuningtyas, R. (2021). Pemanfaatan Limbah Popok Bayi (Diapers) Sebagai Media Tanam. *Jurnal Rekayasa Lingkungan, 21*(1), 41-49. doi:DOI: https://doi.org/10.37412/jrl.v21i1.91

Widiatningrum, T., Pukan, K. K., R Susanti, & Sukaesih, S. (2018). Pemanfaatan Limbah Popok Sebagai Sarana Pendidikan Karakter Peduli Lingkungan Anak Usia Dini. *Jurnal Phenomenom, 8*(2), 129-141.

Willard, K., Sarungu, S., Pongarrang, F., Kertapati, M. R., Arif, R. G., & Oktaviani, F. (2024). Gerakan Dosen Dan Mahasiswa STT Migas Dalam Mengelola Limbah Dengan Metode 3R Di Kawasan Pantai Dusit Balikpapan. *Journal Of Human And Education (JAHE), 4*(4), 681-690. doi: https://doi.org/10.31004/jh.v4i4.1331

Yuliati, H. S., Lanny Agustine, Sitepu, R., Angka, P. R., Pranjoto, H., . . . Sianto, M. E. (2024). The Organic Waste Processing as an Alternative Energy Source of Bio- Briquettes For Kedung Klinter Citizen Surabaya. *ABDIMAS: Jurnal Pengabdian Masyarakat,, 7*(3), 1364–1372. doi:https://doi.org/10.35568/abdimas.v7i3.4872

https://doi.org/10.35568/abdimas.v8i1.5461