



IMPLEMENTATION OF *GERMAS*, ESPECIALLY THE ASPECT OF HEALTHY ENVIRONMENT IN PULAU ATAS SAMARINDA

Apriyani *, Suwignyo, Rindha Mareta Kusumawati, Kartina Wulandari

Program Studi Kesehatan Masyarakat, Fakultas Kesehatan Masyarakat,
Universitas Widyagama Mahakam Samarinda, Samarinda, Kalimantan Timur 75243, Indonesia

Email: * riri.april4491@gmail.com

Abstract

The Healthy Living Community Movement (*Germas*) is a planned activity carried out jointly with awareness, willingness, and ability to behave healthily to improve the quality of life. People generally see health as related to lifestyle, if they are sick then it must have something to do with food even though the influence of the environment on health is quite large. So the purpose of this study is to find out and educate the public on environmental health. This study uses descriptive quantitative research design with the population of Pulau Atas in Samarinda, selecting 100 respondents with incidental sampling technique and using interviews to find out the condition of the community. Respondents who have trash bins are 76, who do waste sorting are only 38, recycling waste is 9, who recycle waste by making compost is 1 person and recycle waste by making handicrafts are 8. Respondents who have latrines are 99. The majority of respondents used PDAM water as many as 86 people and respondents who consumed refillable gallon water were 69. Almost most of the community has understood implementing a healthy environment such as garbage, use of latrines and clean water for daily activities. Only a small part of the community does not apply a healthy environment. However, waste management is still not maximally carried out.

Keywords : Garbage, *Germas*, Latrine, Water

Introduction

Developing countries often face the double burden of both communicable and non-communicable diseases ^[1]. The goal of addressing communicable and non-communicable diseases has been included in global agendas such as the MDGs. However, by the end of the MDGs in 2015, many countries had yet to achieve the set goals. After 2015, a new agenda was rolled out, the SDGs, which also targets several indicators related to handling infectious and non-communicable diseases, and includes universal health coverage, which is expected to be achieved by 2030 ^[2]. Improvements in disease prevention efforts will bring enormous benefits. Disease prevention is a key investment to reduce the financial burden on countries in providing health services to the population. Developing countries especially feel this pressure due to limited funding and the risk of budget unsustainability, especially for non-communicable diseases that require expensive and long-term treatment ^[3]. Many studies have shown that community-based health promotion and disease prevention approaches are more effective, as shown by the Watson-Thompson et al. study in 2008 ^[4]. As a result of these findings, the Indonesian government started the Healthy Living Community Movement (*GERMAS*). This is a health promotion and disease prevention initiative that emphasizes the central role of the community as the main actor ^[2].

The Healthy Living Community Movement (*Germas*) is an action carried out in a planned and

systematic manner by all elements of society with awareness, motivation, and capacity to adopt healthy behaviors to improve quality of life. *Germania* is built on the concept of integrated disease control and involves various sectors ^[5]. Every individual is connected to the environment in their lives. Everything outside of us is part of the environment ^[6]. People generally associate health with lifestyle, such as healthy activity patterns. When someone is sick, it is often linked to the food aspect. However, it is important to remember that the influence of the environment on health is also quite significant. The focus of public health efforts has tended to be on health services. However, improving the level of public health, in particular, is strongly influenced by environmental factors ^[5]. H.L. Blum's theory has been one of the most influential views in assessing the contribution of the environment to public health. Since its introduction in the 1960s, this theory is still relevant today. This theory suggests that the degree of public health is influenced by various factors, including 40% from environmental factors, 30% from individual behavior, 20% from health services, and 10% from genetics or heredity ^[5]. Most of the 40% of environmental factors that affect public health are issues related to waste management, water quality, and sanitation or latrine facilities used by the community. These are the aspects that can be clearly seen and have a major impact on the overall health of the community.

Waste, according to the definition of the World Health Organization (WHO), refers to objects or materials that are no longer used, unwanted, or discarded by humans from their activities and do not occur naturally. In his book entitled "Processing Waste," Ir. Wied Harry Apriadi explains that the process of waste disposal involves three stages, namely refuse storage, refuse collection, and refuse disposal ^[7]. Separation of waste should be done at each stage or phase of waste movement. In addition to waste, the Water Environmental Health Quality Standard for Sanitary Hygiene Purposes also includes physical, biological, and chemical parameters that fall into the category of parameters that must be met or checked periodically and additional parameters that are checked when geohydrological conditions indicate potential pollution of water because water is crucial for drinking, bathing, cooking, and various other activities. Latrines are also something that must be considered as sanitation for every home. Every day humans must dispose of their feces so that if it is not properly accommodated it will cause various kinds of diseases ^[8]. According to the 5 Pillars of Community-Based Total Sanitation (STBM) guidelines, a healthy latrine is one that meets standards in building construction and fulfills health criteria. These health requirements include the provision that healthy latrines should not cause the spread of hazardous materials from human waste disposal and can also prevent disease vectors from transmitting diseases to users and the surrounding environment ^[9].

However, in Indonesia itself there are still many people who have not paid attention to the three crucial things that are produced and used every day. Research conducted by Puspendari, Taufik and Putri (2023) also said this, so it can be said that if Indonesian people still do not care about the health of their environment, diseases caused by dirty environments are also common in people's lives ^[10]. Therefore, based on the above considerations, the researchers conducted a study with the aim of knowing and educating the community on environmental health with the hope that the community will be able to pay more attention to their home environment including garbage, and the use of water and latrines.

Method

This research adopts a quantitative descriptive research design, which aims to describe the variables in their actual state using data in the form of numbers. The population of this research is the community in Pulau Atas, Samarinda. The selection of respondents was carried out using incidental sampling technique, which is a sampling technique based on chance or incidental, where the researcher can use individuals met by chance as a sample if the person is suitable for the required data source ^[11]. This research was conducted by collecting data through interview instruments and

observations of community members selected as samples, with a total of 100 respondents consisting of women and men. The data collected will then be analyzed descriptively using the percentage and narrative methods. This approach is expected to provide a comprehensive picture of the phenomenon under study, as well as enable the identification of patterns and trends that may exist in people's behavior or perceptions of the topic under examination. As such, this research is expected to be able to make a meaningful contribution in further understanding of the issue under study.

Results

From the population of the community in Pulau Atas Urban Village in Samarinda City, 100 sample respondents were obtained, consisting of 22 men or 22% and 78% of the community were female or 78 people. The age characteristics of respondents were in the age range of 15 to 75 years with the most being at the age of 26 to 35 years as many as 29 people. While the least is at the age of 66 to 75 years consisting of only 3 people. In addition, when viewed from the education of respondents, the most are high school graduates, namely 39 people and the least are respondents who do not attend school, namely 6 people. The results of the interviews generated based on 3 things namely garbage, water, and latrines will be described in a table according to the problem. The following data based on the ownership of the respondent's trash can be seen in table 1 below as follows.

Table 1. Frequency distribution of respondents based on trash can ownership

Trash can	Total	Percentage (%)
Exist	76	76,0
Not exist	24	24,0
Total	100	100,0

Based on table 1 frequency distribution above, it is found that 76 respondents (76%) have trash bins. While respondents who did not have a trash can were 24 people (24%). Ownership of a trash can is a crucial aspect in maintaining environmental cleanliness. By having adequate trash bins, both in households and in public spaces, people can more easily separate and dispose of waste according to their category or type ^[12]. This helps in more efficient recycling and waste management efforts. In addition, the ownership of trash bins also triggers awareness of the importance of keeping the surrounding environment clean, as well as being a concrete step in mitigating the negative impacts of environmental pollution ^[13]. Accordingly, the ownership of trash bins not only fulfills the basic need for cleanliness, but also plays an important role in building a sustainable culture of environmental care. Here it can be said that many people already care about the home and surrounding environment. The following figure 2 contains data based on respondents who make waste selection.

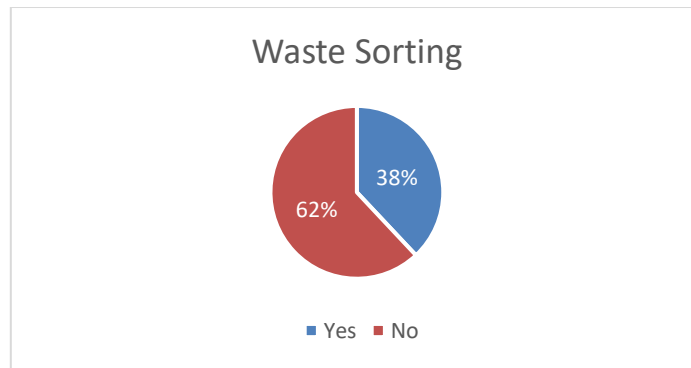


Figure 1. Frequency distribution of respondents based on waste sorting

Based on Figure 2 frequency distribution above, it was found that only 38 respondents (38%) sorted their waste. While respondents who did not sort waste were 62 people (62%). The following data is based on respondents' waste recycling. Waste sorting is a crucial process in waste management that aims to separate various types of materials so that they can be processed or recycled effectively [14]. The main sources of waste that require segregation include households, industries, and commercial sectors. From households, waste can originate from daily activities such as cooking, cleaning, and disposing of product packaging. Industry and the commercial sector are also significant contributors, with various types of waste including production materials, product packaging, and service waste. Proper segregation makes it possible to maximize the potential for recycling and waste reduction, reduce negative impacts on the environment, and promote a sustainable economic cycle [15].

Table 2. Frequency distribution of respondents based on waste recycling

Waste recycling	Total	Percentage (%)
Yes	9	9,0
No	91	91,0
Total	100	100,0

Based on table 2 frequency distribution above, it was found that only 9 respondents (9%) recycled waste. While respondents who did not recycle waste were 91 people (91%). Recycling household waste is a vital process in an effort to reduce negative impacts on the environment. Through this step, various types of materials such as paper, plastic, glass, and metal generated from daily activities in households can be collected, processed, and converted into new raw materials [16]. The first step in recycling household waste involves separate sorting of materials to ensure that recyclable materials do not mix with non-recyclable waste. Recycling not simply helps reduce pressure on natural resources, but also reduces greenhouse gas emissions and waste going to landfill [17]. Through awareness of the importance of recycling and active participation from the community, household waste recycling programs can contribute significantly to the global goal of minimizing negative impacts on the environment.

Table 3. Frequency distribution of respondents based on type of waste recycling

Waste recycling	Total	Percentage (%)
Composting	1	11
Handicrafts	8	89
Total	9	100

Based on table 3 frequency distribution above, the data shows that respondents who recycle waste by making compost are only 1 person (11%) while respondents who recycle waste by making handicrafts are 8 people (89%). Recycling compost is the process of decomposing organic materials, such as food waste and leaves, into nutrient-rich humus that can be used to improve the quality of agricultural soil [18]. This process not only decreases the amount of waste that goes into landfills, but also produces natural fertilizers that are environmentally friendly. Recycling crafts, on the other hand, refers to the creativity in transforming used or recycled materials into new products that have both aesthetic and functional value [19]. Examples of recycled crafts include bags from used plastic bags, wall hangings from used cans, or jewelry from old electronic materials. Both recycled compost and recycled handicrafts represent important innovations in waste management that not only reduce negative impacts on the environment, but also create added value from materials that would otherwise be considered waste. There were 99 respondents (99%) who owned a toilet while only 1 respondent (1%) did not own a toilet. A latrine, also known as a toilet or water closet, is an essential sanitation facility designed to contain and treat human waste. It can be a simple physical structure of a hole in the ground or a more complex structure with a water management system [20]. Modern latrines are usually equipped with efficient irrigation and waste treatment systems. Latrines play an important role in maintaining public health and reducing the spread of water-related diseases, as they allow people to safely and hygienically dispose of their body waste. In addition, latrines also contribute to water conservation and environmental protection through proper sanitation practices. With adequate access to latrine facilities, communities can improve their quality of life and create a cleaner and healthier environment for all [21].

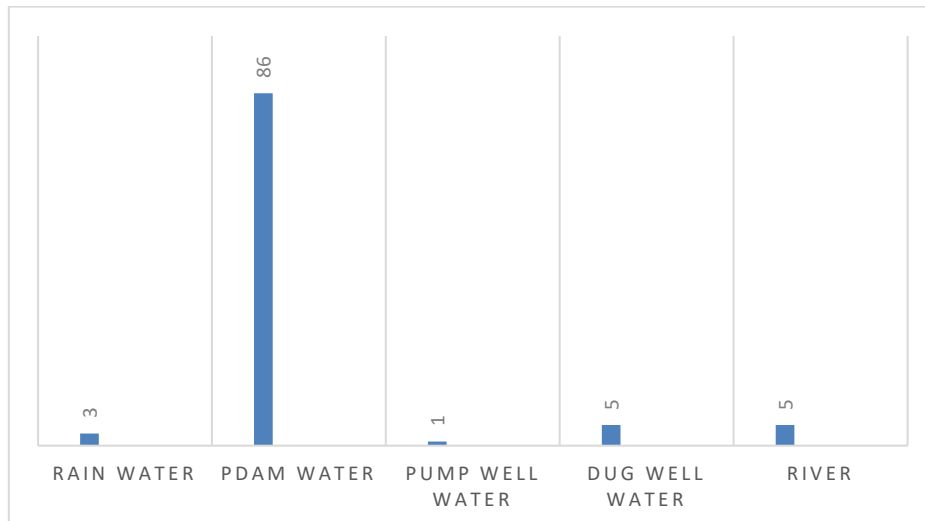


Figure 2. Frequency distribution of respondents based on clean water source

Based on the picture of clean water sources, the data shows that the majority of respondents use PDAM water as many as 86 people (86%). Clean water sources are vital elements for human survival and health. This includes natural sources such as rivers, lakes, springs, as well as unpolluted underground water sources. Clean water is an essential resource to fulfill daily needs such as drinking, cooking, bathing, and cleaning. In addition, clean water is also a key component in agriculture,

industry, and other economic activities ^[22]. The importance of clean water in maintaining public health cannot be overstated, and its availability is a key factor in determining the quality of life of a community ^[23]. Therefore, the protection and wise management of clean water sources is a shared responsibility for communities, governments and environmental organizations to ensure its availability for future generations.

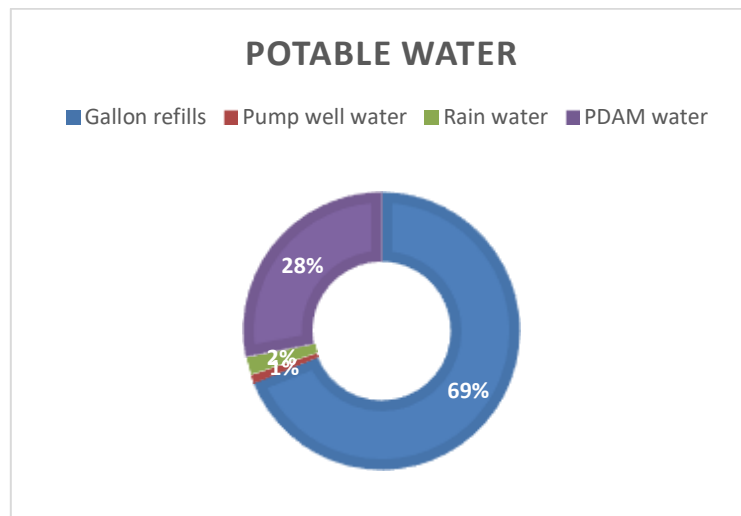


Figure 3. Distribusi Frekuensi Responden Berdasarkan Sumber Air Minum

Based on the frequency distribution picture above, the data shows that the majority of respondents use refillable gallon water as many as 69 people (69%). A potable water source is any natural or artificial source that provides water that is safe and suitable for human consumption without significant health risks. This includes natural sources such as rivers, lakes, springs, and clean wells that have been tested and meet established water quality standards ^[24]. The water supply system also includes infrastructure installations such as water purification, distribution channels, and household installations to ensure the water that reaches consumers is safe and healthy. The availability of access to an adequate source of drinking water is a basic right of every individual, and plays a crucial role in maintaining public health and promoting a quality life ^[25]. Therefore, it is important to carefully monitor, protect and manage potable water sources to meet the basic needs of every community.

So based on all the data that has been described, the people of Pulau Atas, Samarinda who have been interviewed have mostly implemented a healthy environment such as garbage, the use of latrines and clean water for daily activities. Only a small proportion of the community did not implement a healthy environment. However, in waste management for recycling or sorting waste, there are still many people who have not done this. This is due to the lack of education in the community about waste and its management so that residents have not been able to implement waste for a variety of more useful activities. So this also requires support from the village to educate about a healthy environment so that the problem of diseases caused by the environment can also be minimized.

Discussion

The people of Pulau Atas Samarinda, who have been interviewed, show a positive trend in implementing healthy environmental practices in their daily lives. Most respondents have been active in managing waste by sorting and recycling, ensuring that the surrounding environment is kept clean and maintained. In addition, most have also adopted the use of latrines and ensured adequate access to clean water for daily use. However, it should be noted that while the majority of the community has

committed to healthy environmental practices, there are still a small number of individuals who have not adopted these habits. Therefore, further efforts need to be made to understand the barriers or constraints faced by this group in order to formulate more effective strategies in getting the entire Upper Island community to actively participate in creating a healthy and sustainable environment.

Waste management for recycling or waste segregation is still a big challenge in many communities. One of the main reasons is the lack of understanding and education given to the community about the importance of waste management ^[26]. Many residents are not fully aware of the negative impacts of littering behavior, both on the environment and human health. Without adequate understanding, residents are unable to implement more sustainable waste management practices in their daily lives. Education is the main factor in changing people's behavior regarding waste ^[27]. Further efforts are needed from relevant parties, especially the local government and village authorities, to provide effective education programs. These programs should include information on the types of waste, proper sorting methods, and the benefits of recycling. This approach is expected to help the community understand that waste is not just a disposal problem, but also a potential resource that can be reused ^[28].

In addition, the role of the village government is crucial in providing support and facilities to optimize waste management. Adequate infrastructure is needed, such as separate waste disposal sites and efficient recycling systems ^[29]. The village government can also conduct regular socialization activities, involve residents in environmental cleanliness programs, and provide incentives or rewards for those who are active in good waste management practices. In addition to environmental benefits, good waste management also has a positive impact on public health. Poorly managed waste can be a source of disease and groundwater contamination ^[30]. Therefore, education on the direct impact of waste management behavior can increase awareness of environmental health. Thus, through joint efforts between the village government, community, and related parties, it is hoped that waste management can become an integral part of a sustainable and responsible lifestyle.

In addition to education and village government support, active community participation is also a crucial element in creating positive changes in waste management. Community participation programs, such as cleanliness campaigns and voluntary actions to clean the environment, can build a spirit of togetherness and shared responsibility for the waste problem ^[31]. Involving communities in the decision-making process regarding waste management policies can increase their sense of ownership and awareness of the consequences of their actions ^[32]. In addition, it needs to be emphasized that waste management is not only the responsibility of the government and the community, but also the private sector. Cooperation between the private sector and the government and communities can create a sustainable and environmentally friendly business model. Investment initiatives in modern recycling and waste management technologies can be a catalyst for positive change in addressing waste issues. Therefore, strategic partnerships between the public and private sectors can create sustainable solutions that involve all levels of society and economic sectors in a joint effort to maintain the sustainability of our environment.

Conclusion

This study can be concluded that many respondents have a trash can even though only a few people recycle waste, either by making compost or handicrafts. As for the ownership of private latrines at home, only 1 respondent did not have a latrine, so it can be said that there are no people who urinate or defecate in public latrines or the surrounding environment such as rivers. In addition, the majority of respondents use PDAM water for bathing, cooking and other activities while the average drinking water consumption uses refillable gallon water and PDAM water. Thus, this study also shows that the community has understood a healthy living environment in order to avoid

infectious and non-communicable diseases. However, development on recycling programs and sorting waste according to its type must still be carried out so that not only the environment is healthy and clean but also creates products that can be reused and purchased.

References

- [1] A. Darmawan, "Pedoman Epidemiologi Penyakit Menular dan Tidak Menular," *Jambi Med.*, vol. 4, no. 2, pp. 195–202, 2016.
- [2] N. D. Febriani, A. K. Sari, G. Ramadhan, G. A. Sari, and O. Purnamasari, "Implementasi Gerakan Masyarakat Hidup Sehat (GERMAS) pada Warga Pamulang Barat, Tangerang Selatan," *Umj*, no. September, p. 2, 2019.
- [3] Izzun Nafiah, "Association Between the Realization of Health Fund Allocation and Utilization of Maternal Health Services in Indonesia," *Kesehat. Indones. J. Ekon.*, vol. 5, no. I N O V A S I-16 (2), 2020; 241-249 <http://journal.feb.unmul.ac.id/index.php/INOVAS>, pp. 1–16, 2021.
- [4] J. Watson-Thompson, S. B. Fawcett, and J. A. Schultz, "A Framework for Community Mobilization to Promote Healthy Youth Development," *Am. J. Prev. Med.*, vol. 34, no. 3 SUPPL., 2008, doi: 10.1016/j.amepre.2007.12.016.
- [5] C. M. Udiani and Hikmandari, *Tiga tahun GERMAS lessons learned*. 2019.
- [6] Y. Indahri, "Pengembangan Pendidikan Lingkungan Hidup melalui Program Adiwiyata (Studi di Kota Surabaya)," *Aspir. J. Masal. Sos.*, vol. 11, no. 2, pp. 121–134, 2020, doi: 10.46807/aspirasi.v11i2.1742.
- [7] W. H. Apriadi, *Memproses Sampah*. Jakarta: Penebar Swadaya, 2005.
- [8] M. Fransiska and D. R. R. Komala, "Faktor-Faktor yang Berhubungan dengan Kepemilikan Jamban Sehat oleh Rumah Tangga Di Indonesia," *J. Mhs. dan Penelit. Kesehat.*, vol. 7, no. 1, pp. 1–15, 2020.
- [9] Peraturan Menteri Republik Indonesia No 82 Tahun 2001, "Peraturan Pemerintah tentang Pengelolaan Kualitas Air Dan Pengendalian Pencemaran Air," *Peratur. Pemerintah tentang Pengelolaan Kualitas Air Dan Pengendali. Pencemaran Air*, pp. 1–22, 2001.
- [10] T. Puspendari, M. Taufik, and M. K. Putri, "Persepsi Masyarakat terhadap Sampah Rumah (Domestik) di Pinggiran Sungai Kecamatan Kertapati Kelurahan Kemang Agung Kota Palembang," *J. Swarnabhumi*, vol. 8, no. 1, pp. 1–11, 2023.
- [11] Sugiyono, *Metode Penelitian Kualitatif, Kuantitatif, dan R&D*. Bandung: Alfabeta, 2019.
- [12] K. J. Mahadewi, N. K. A. Candrawati, N. K. I. D. Yanti, I. W. A. Sumartana, and N. P. A. Nilayanti, "Pengadaan Tempat Sampah Sebagai Wujud Implementasi Pemilahan Sampah Di Desa Marga Dajan Puri," *Kumawula J. Pengabd. Kpd. Masy.*, vol. 5, no. 3, p. 485, 2022, doi: 10.24198/kumawula.v5i3.38146.
- [13] A. N. Cahyawati, "Analisis Pemanfaatan Tong Sampah Organik dan Anorganik dengan Metode Work Sampling," in *Seminar Nasional Teknologi Informasi Komunikasi dan Industri*, 2016, no. November, pp. 282–285.
- [14] L. Intan Paradita, "Pemilahan Sampah: Satu Tahap Menuju Masyarakat Mandiri Dalam Pengelolaan Sampah," *BERDIKARI J. Inov. dan Penerapan Ipteks*, vol. 6, no. 2, pp. 184–194, 2018, doi: 10.18196/bdr.6245.
- [15] E. Andina, "The Analysis of Waste Sorting Behavior in Surabaya," *J. Aspir.*, vol. 10, no. 2, pp. 119–138, 2019, doi: 10.22212/aspirasi.v10i2.1424.
- [16] I. M. B. Dirgantara, "Pengetahuan Mendaur Ulang Sampah Rumah Tangga Dan Niat Mendaur Ulang Sampah," *Pengetah. Mendaur Ulang Sampah Rumah Tangga Dan Niat Mendaur Ulang Sampah*, vol. 10, no. 1, pp. 1–12, 2013, [Online]. Available: <https://core.ac.uk/download/pdf/161689543.pdf>.

- [17] A. Rosdiana and P. A. Wibowo, "Program Pendampingan Daur Ulang Sampah Sebagai Upaya Pengurangan Polusi Lingkungan Melalui Transformasi untuk Nilai Tambah Ekonomi," *KUAT Keuang. Umum dan Akunt. Terap.*, vol. 3, no. 2, pp. 95–100, 2021, doi: 10.31092/kuat.v3i2.1203.
- [18] Aristoteles *et al.*, "Pembuatan Pupuk Kompos dari Limbah Organik Rumah Tangga di Desa Gedung Harapan, Kecamatan Jati Agung, Lampung Selatan," *Buguh J. Pengabd. Kpd. Masy.*, vol. 1, no. 1, pp. 17–24, 2021, doi: 10.23960/buguh.v1n1.64.
- [19] N. Marliani, "Pemanfaatan Limbah Rumah (Sampah Anorganik) Tangga Sebagai Bentuk Implementasi dari Pendidikan Lingkungan Hidup," *J. Form.*, vol. 4, no. 2, pp. 124–132, 2014, [Online]. Available: <https://media.neliti.com/media/publications/234976-pemanfaatan-limbah-rumah-tangga-sampah-a-533e820b.pdf>.
- [20] O. Widyastutik, "Faktor Yang Berhubungan Dengan Kepemilikan Jamban Sehat Di Desa Malikian, Kalimantan Barat," *Ikesma*, vol. 13, no. 1, 2017, doi: 10.19184/ikesma.v13i1.5223.
- [21] Mukhlisin and E. N. Solihudin, "Kepemilikan Jamban Sehat Pada Masyarakat," *Faletehan Heal. J.*, vol. 7, no. 03, pp. 119–123, 2020, doi: 10.33746/fhj.v7i03.197.
- [22] H. Rengganis and W. Seizarwati, "Strategi Dan Upaya Pemanfaatan Sumber Air Umbulan Untuk Penyediaan Air Bersih Di Provinsi Jawa Timur," *J. Tek. Hidraul.*, no. 82, pp. 63–76, 2015, [Online]. Available: <https://jurnalth.pusair-pu.go.id/index.php/JTH/article/view/513>.
- [23] A. S. Suryani, "Persepsi Masyarakat Dalam Pemanfaatan Air Bersih (Studi Kasus Masyarakat Pinggir Sungai Di Palembang)," *Aspirasi*, vol. 7, no. 1, pp. 33–48, 2018.
- [24] N. Oktavianisya, S. Alifitah, and L. Hasanah, "Pemberdayaan Masyarakat dalam Penggunaan Air Bersih dan Air Minum di Desa Cangkreg Kecamatan Lenteng," *JAPI (Jurnal Akses Pengabd. Indones.*, vol. 5, no. 2, pp. 98–107, 2020, doi: 10.33366/japi.v5i2.2120.
- [25] Z. Mildulandy Rahim and S. Muchlisoh, "Faktor Yang Mempengaruhi Penggunaan Sumber Air Minum Layak Di Bengkulu Tahun 2018," in *Seminar Nasional Official Statistics*, 2021, vol. 2020, no. 1, pp. 1137–1146, doi: 10.34123/semnasoffstat.v2020i1.605.
- [26] M. Dewi, "Evaluasi dan Pengembangan Aspek Teknis TPS dan TPS 3R di Kecamatan Pare Kabupaten Kediri," *Tecnoscienza*, vol. 5, no. 1, pp. 60–72, 2020.
- [27] N. L. P. Juniartini, "Pengelolaan Sampah Dari Lingkup Terkecil dan Pemberdayaan Masyarakat sebagai Bentuk Tindakan Peduli Lingkungan," *J. Bali Membangun Bali*, vol. 1, no. 1, pp. 27–40, 2020.
- [28] M. P. P. Tetuko and R. Subekti, "Implementasi Program Pengelolaan Limbah Rumah Tangga Domestik Di Kelurahan Danukusuman Kota Surakarta," *J. Komun. Yust.*, vol. 5, no. 3, pp. 330–342, 2022, doi: 10.23887/jatayu.v5i3.55432.
- [29] T. I. Putra, N. Setyowati, and E. Apriyanto, "Identifikasi Jenis Dan Pengelolaan Limbah Bahan Berbahaya Dan Beracun Rumah Tangga: Studi Kasus Kelurahan Pasar Tais Kecamatan Seluma Kabupaten Seluma," *Nat. J. Penelit. Pengelolaan Sumber Daya Alam dan Lingkung.*, vol. 8, no. 2, pp. 49–61, 2019, doi: 10.31186/naturalis.8.2.9209.
- [30] G. Widjaja and S. Lovianda Gunawan, "Dampak Sampah Limbah Rumah Tangga Terhadap Kesehatan Lingkungan," *Zahra J. Heal. Med. Res.*, vol. 2, no. Oktober, pp. 266–275, 2022.
- [31] K. D. Yuliesti, S. Suripin, and S. Sudarno, "Strategi Pengembangan Pengelolaan Rantai Pasok Dalam Pengelolaan Sampah Plastik," *J. Ilmu Lingkung.*, vol. 18, no. 1, pp. 126–132, 2020, doi: 10.14710/jil.18.1.126-132.
- [32] M. Z. Elamin *et al.*, "Analisis Pengelolaan Sampah Pada Masyarakat Desa Disanah Kecamatan Sreseh Kabupaten Sampang," *J. Kesehat. Lingkung.*, vol. 10, no. 4, pp. 368–375, 2018, doi: 10.20473/jkl.v10i4.2018.368-375.