

Analysis of Factors Influencing Community Behavior in Household Waste Management on Lakkang Island, Indonesia

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Received November 8, 2023; Revised December 29, 2023; Accepted January 17, 2024

Cite This Paper in the Following Citation Styles

(a): [1] Muh. Fajaruddin Natsir, Muh Iqran Al MuktaDir, Erniwati Ibrahim, Anwar Daud, Mahfuddin Yusbud, Suci Rahmadani, Arif Anwar, Muhammad Asfar, Ain Khaer, "Analysis of Factors Influencing Community Behavior in Household Waste Management on Lakkang Island, Indonesia," *Environment and Ecology Research*, Vol. 12, No. 1, pp. 19 - 26, 2024. DOI: 10.13189/eer.2024.120103.

(b): Muh. Fajaruddin Natsir, Muh Iqran Al MuktaDir, Erniwati Ibrahim, Anwar Daud, Mahfuddin Yusbud, Suci Rahmadani, Arif Anwar, Muhammad Asfar, Ain Khaer (2024). *Analysis of Factors Influencing Community Behavior in Household Waste Management on Lakkang Island, Indonesia*. *Environment and Ecology Research*, 12(1), 19 - 26. DOI: 10.13189/eer.2024.120103.

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Abstract This research aims to find out the relationship between knowledge, income, social environment, and physical facilities of the community with household waste management behavior on Lakkang Island. The type of research used is analytical observational with a cross-sectional approach. The population in this study were heads/housewives on Lakkang Island. The sample in this research was 110 respondents. The research results indicate that knowledge and the social environment have a significant impact on household waste management behavior in the Lakkang Island community, as evidenced by p-values of 0.000 and 0.011, respectively. In contrast, income and access to physical facilities are factors that do not exert a significant influence on people's behavior in managing household waste, with p-values of 0.333 and 0.449, respectively. Knowledge and social environment are significant factors, while income level and physical facilities are factors that do not have a significant influence on people's behavior in managing household waste. So, there is a need to pay more attention to knowledge, especially regarding household waste management, apart

from that, the provision of physical facilities needs to be a concern for the government on Lakkang Island.

Keywords Waste Management, Behavior, Waste, Household

1. Introduction

The problem of waste remains a significant environmental challenge in nearly all regions. The escalating volume of waste, when not managed properly, can lead to environmental pollution, directly conflicting with Sustainable Development Goals (SDGs) such as 'Clean Water and Sanitation' (SDG 6) and 'Sustainable consumption and production' (SDG 12). Waste possesses the potential to cause various environmental issues, including water, land, and air pollution, as well as health and socio-economic problems, thereby contravening SDG goal number 3, which focuses on 'Good Health and

Well-being'. According to the World Bank's estimation, the worldwide production of municipal solid waste (MSW) is expected to rise to 2.2 billion tons annually by 2025 [1].

Apart from being caused by population growth, the increase in waste can also be caused by industrial development, urbanization, and modernization. However, the main thing is that the increase in waste, especially domestic waste, is due to the increasing population. According to population projections by the Central Statistics Agency (BPS), Indonesia's population is expected to reach 284.83 million in 2025, up from 238.52 million in 2010. It is estimated that each household in Indonesia will produce 0.52 kg of waste per person per day [2].

In 2022, Indonesia generated a total of 19,305,946 tons of waste, reflecting a reduction of 5,013,175 tons/year, which accounts for approximately 26.2% of the country's total waste generation. Meanwhile, Makassar City produced 373,653 tons/year of waste, with a reduction of 38,864 tons/year, representing only about 10% of the city's total waste generation in 2022 [3].

However, Indonesia's existing waste management system still relies on a conventional approach to pile, transport, and dispose. If not met with effective management, the rise in waste production leads to pollution. To counter this, adequate facilities and infrastructure are essential. Waste reduction is achievable through strategies like limiting waste generation and promoting recycling and reuse, collectively known as the 3R management system. Despite its potential, the implementation of 3R activities in communities faces obstacles, notably the lack of public awareness about waste sorting [4], [5].

Lakkang Island is one of the small islands in Makassar City, Indonesia. This island with an area of 1.65 km² is located between 3 rivers, namely the Tallo River Delta, the Pampang River, and the Hasanuddin University River, and has a population of 975 people [6].

Research shows that there are still ecological problems on Lakkang Island. The bad effects that may arise due to lack of management have the potential to make this location a burden for the Makassar City area. This needs serious attention, especially because Lakkang Island has tourism potential that can be developed in the future [7].

Based on the background above, it is necessary to analyze factors related to community behavior in waste management, including level of knowledge, income, social environment, and physical facilities. This analysis will

discuss how these factors influence community behavior in managing household waste on Lakkang Island, Makassar City.

2. Materials and Methods

This research uses a cross-sectional approach, namely a form of observational study which aims to find/study the relationship between independent variables and dependent variables, by measuring or collecting them simultaneously (at the same time) or a point time approach [8]. The research was conducted on Lakkang Island, Makassar City, from April to September 2023. The study population consisted of 440 households on Lakkang Island. The collected data was processed and analyzed using the chi-square statistical test with a 2×2 contingency table. Subsequently, the findings were presented in tabular form.

Sample Size:

The participants in this study were heads of families or housewives residing on Lakkang Island. The sample size for this study was determined using the formula developed by Lemeshow.

The sample size calculation in this study was based on the following parameters: Population size ($N = 440$), $Z = 1.96$ (corresponding to a 95% level of significance), $p =$ Proportion of generated waste/managed waste = 0.10, $q = 1 - p = 1 - 0.10 = 0.90$, and $d =$ Desired absolute error rate (0.05).

Using these values, the formula for sample size calculation is:

$$n = \frac{NZ^2pq}{d^2(N-1) + Z^2pq}$$

$$n = \frac{440(1,96)^2 0,10 \times 0,90}{(0,05)^2(440 - 1) + (1,96)^2 0,10 \times 0,90} = 105,4$$

According to the calculations above, the sample size for this research was adjusted and rounded to 110 respondents. The sampling technique employed in this study was probability sampling, specifically systematic random sampling. In this method, the first sample was chosen randomly, and subsequent samples were selected at regular intervals. Each population element was selected based on a predetermined distance interval.

3. Results

Respondent Characteristics

In Table 1, we present the distribution of respondent characteristics on Lakkang Island, Indonesia, in the year 2023. The table provides an overview of key demographic information related to the respondents involved in the study. Table 1 reveals the demographic composition of respondents on Lakkang Island, Indonesia, in the year 2023. The data indicates that the majority of respondents were female, accounting for 78 individuals or 70.9%, while 32 people or 12.7% were male. Regarding age, the predominant age group was 36 to 55 years, encompassing 63 individuals or 57.3% of the respondents. Moreover, the occupational distribution highlighted that 61 respondents, equivalent to 55.5%, were identified as Housewives, reflecting the dominant occupation among the participants.

Figure 1 indicates that 50.9% of the respondents exhibited good enough knowledge. In the income level category, 60.9% of the respondents reported low income levels. Within the social environment category, the majority of the respondents (51.8%) reported having a good enough social environment. Concerning physical facilities availability, 65.5% of the respondents stated they have access to rubbish bins. In the behavior category,

69.1% of the respondents displayed poor behavior in managing household waste.

Table 1. Distribution of Respondent Characteristics on Lakkang Island, Indonesia, 2023

Gender	n	%
Male	32	29.1
Female	78	70.9
Age	n	%
15 – 35	31	28.1
36 – 55	63	57.3
>55	16	14.6
Occupational	n	%
Not Working	9	8.1
Laborer	6	5.4
Fish Farmers	4	3.6
Businessman	8	7.3
Housewife	61	55.5
Fisherman	15	13.6
Teacher	2	1.8
Private employees	5	4.5
Total	110	100

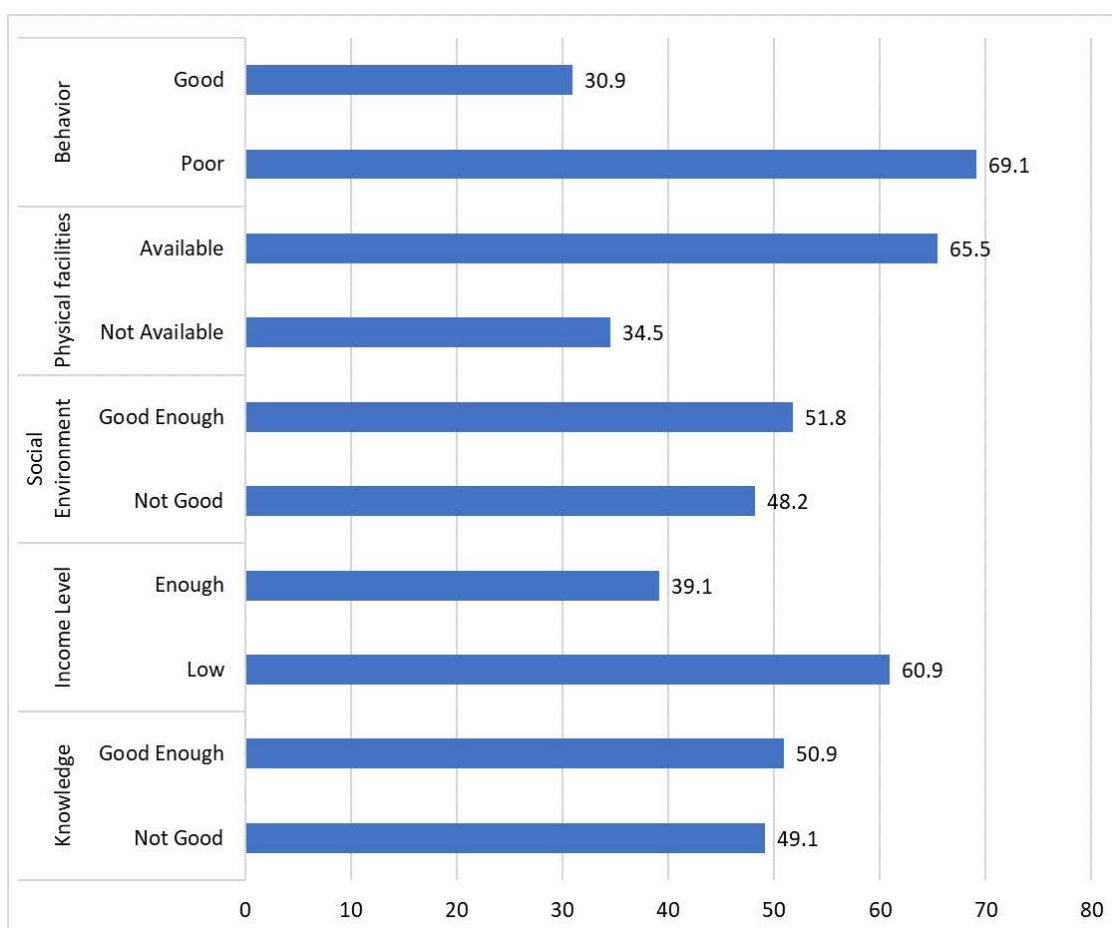


Figure 1. Distribution of Knowledge, Income Level, Social Environment, and Physical Facilities of Respondents on Lakkang Island, Indonesia, 2023

Table 2. Relationship between Knowledge and Waste Management Behavior on Lakkang Island, Indonesia, 2023

Knowledge	Behavior				<i>p-value</i>
	Good		Poor		
	n	%	n	%	
Good Enough	26	23.6	30	27.3	0,000
Not Good	8	7.3	46	41.8	
Total	34	30.9	76	60.1	

The data from Table 2 indicates that the majority of respondents, comprising 41.8%, fall into the category of a poor level of knowledge and poor waste management behavior. Conversely, the smallest group, constituting only 7.3% of respondents, was found in the category of individuals with a poor level of education and good waste management behavior.

Moreover, the statistical test (chi-square) conducted to analyze the relationship between the level of knowledge and waste management behavior yielded a p-value of 0.000, which is less than α (0.05). Therefore, the null hypothesis (H0) is rejected, indicating a significant relationship between the level of knowledge and waste management behavior among the respondents.

Table 3. Relationship between Income Level and Waste Management Behavior on Lakkang Island, Indonesia, 2023

Income Level	Behavior				<i>p-value</i>
	Good		Poor		
	n	%	n	%	
Enough	11	10	32	29	0,333
Low	23	21	44	40	
Total	34	31	76	69	

The data from Table 3 indicates that the majority of respondents, accounting for 40%, belong to the category with a low level of income and poor waste management behavior. Conversely, the smallest group, constituting only 10% of respondents, was found in the category of individuals with enough level of income and good waste management behavior.

Furthermore, the statistical test (chi-square) conducted to analyze the relationship between the level of income and waste management behavior resulted in a p-value of 0.333, which is greater than α (0.05). Therefore, the null hypothesis (H0) is accepted, suggesting that there is no significant relationship between income level and waste management behavior among the respondents.

Table 4. Relationship between Social Environment and Waste Management Behavior, On Lakkang Island, Indonesia, 2023

Social Environment	Behavior				<i>p-value</i>
	Good		Poor		
	n	%	n	%	
Good Enough	60	54.6	30	27.3	0,011
Not Good	16	14.5	4	3.6	
Total	76	69.1	34	30,9	

The data from Table 4 indicates that the majority of respondents, amounting to 54.6%, fall into the category of a good enough social environment and good waste management behavior. Conversely, the smallest group, comprising only 3.6% of respondents, was found in the category of individuals with a not good social environment and poor waste management behavior.

Moreover, the statistical test (chi-square) conducted to analyze the relationship between the social environment and waste management behavior resulted in a p-value of 0.011, which is less than α (0.05). Therefore, the null hypothesis (H0) is rejected, indicating a significant relationship between the social environment and waste management behavior among the respondents.

Table 5. Relationship between Physical Facilities and Waste Management Behavior, On Lakkang Island, Indonesia, 2023

Physical Facilities	Behavior				<i>p-value</i>
	Good		Poor		
	n	%	n	%	
Available	48	43.6	24	21.8	0,449
Not Available	10	9.2	28	25.4	
Total	58	91.8	42	8.2	

The data from Table 5 shows that the majority of respondents, comprising 43.6%, have access to available physical facilities and good waste management behavior. Conversely, the smallest group, constituting only 9.2% of respondents, was found in the category of individuals without physical facilities and good waste management behavior.

Furthermore, the statistical test (chi-square) conducted to analyze the relationship between physical facilities and waste management behavior resulted in a p-value of 0.449, which is greater than α (0.05). Therefore, the null hypothesis (H0) is accepted, suggesting that there is no significant relationship between the availability of physical facilities and waste management behavior on Lakkang Island, Indonesia.

4. Discussion

After researching 110 respondents of heads and housewives on Lakkang Island, Makassar City, Indonesia, the results indicate that based on bivariate analysis, knowledge, and the social environment were proven to be significant factors influencing people's behavior in waste management behavior on Lakkang Island. However, factors such as the level of income and the availability of physical facilities on Lakkang Island, Indonesia, were found to be unrelated to people's waste management behavior.

4.1. Knowledge

Knowledge is the result of understanding and perceiving an object, influenced significantly by formal education [9]. Respondents with limited knowledge are twice as likely not to manage waste compared to those with high knowledge [10]. Therefore, respondents' knowledge plays a pivotal role in household waste management behavior. Insufficient understanding of the household waste management process and related aspects can potentially influence their behavior in managing household waste on Lakkang Island.

The research findings presented suggest a significant correlation between community knowledge levels and waste management behavior on Lakkang Island. This outcome aligns with prior research documented in the scientific literature [11–14]. Lower knowledge tends to correspond with inadequate waste management behavior, whereas higher knowledge is more likely to result in better waste management practices.

The results of the hypothesis testing, employing the Chi-Square test, indicate a p-value of 0.013 (<0.05), confirming a significant relationship between people's knowledge and their behavior in waste management. Consequently, it is imperative for relevant authorities and institutions to devise education and public awareness strategies concentrated on enhancing knowledge about waste management. These strategies may encompass community education programs, training initiatives, and social campaigns aimed at augmenting public awareness and understanding of the significance of proper waste management. Such efforts are crucial for fostering responsible waste management practices within the community.

A person with good knowledge about waste management is defined as someone who comprehends various aspects of waste, including types, sources, factors influencing production, the impact of waste on health, society, and the environment, requirements for waste bins, operational activities in waste management, tools used in waste processing, and methods of waste disposal [15]. This comprehensive understanding is directly linked to adopting positive behaviors. The respondent's level of knowledge significantly influences their waste disposal behavior, and

incorrect responses in the study were attributed to respondents' lack of knowledge about proper waste disposal and management.

Therefore, it is essential to enhance knowledge to align household waste management with expected standards. Knowledge enhancement can be achieved through counseling sessions or by providing information related to household waste management. By increasing awareness about the health implications associated with environmental conditions, it is anticipated that waste management practices, particularly waste disposal behavior, will improve. This, in turn, can contribute to creating a cleaner, more beautiful, and healthier environment [16].

4.2. Income Level

Income level, often referred to as personal income or profit before tax, represents the earnings received by individuals for their work performance over a specific period, be it daily, weekly, monthly, or annually. It includes both monetary and non-monetary receipts and is a crucial factor influencing people's ability to manage their household waste effectively.

In the context of this study, it was observed that individuals with salaries above the Regional Minimum Wage (RMW) are influenced by their income concerning household waste management [17]. However, the results of the Chi-Square test, indicating a p-value of 0.333 ($p > 0.05$) in the relationship between income level and household waste management behavior, suggest that there is no significant correlation between these variables. This finding aligns with prior research conducted on the Pekapuran riverbanks, which also found no significant relationship between income and household waste management ($p = 0.184$, $p > 0.05$) [18].

The disparity in results between the current study and the research conducted by Jayanti et al [19] underscores the intricate nature of the relationship between income and household waste management behavior. While their study found a positive and significant influence of income on waste management behavior, the absence of a similar pattern in the current research highlights the complexity of these dynamics.

Indeed, household waste management behavior is influenced by a multitude of factors. Apart from income, variables such as the level of education, environmental awareness, and accessibility to waste management services play pivotal roles in shaping people's behavior concerning household waste. These factors interconnect in intricate ways, and their impact can vary significantly across different communities and contexts. Consequently, a comprehensive understanding of these multifaceted relationships is essential for devising effective waste management strategies tailored to specific communities.

Certainly, conducting further research to identify additional factors influencing household waste

management behavior is crucial for a comprehensive understanding of this issue. A deeper exploration of these variables can provide valuable insights to design more effective policies and intervention programs, which can improve community waste management behavior, regardless of income levels. The costs of inconvenience arising from waste are generally higher than the costs of processing waste, especially the sorting itself [20]. This economic reality emphasizes the significance of addressing not only the environmental and health aspects of waste management but also the economic implications associated with waste.

The empirical evidence presented in these results suggests that higher income may have complex effects on waste management opportunities. With an increase in household income, the ability to purchase goods and services also rises, leading to higher consumption and, potentially, increased waste generation. Moreover, individuals with higher incomes might be more inclined to demand better environmental quality, which can translate into a willingness to pay more for waste transportation services. However, it appears that individuals with higher incomes may not be as inclined to directly engage in waste management activities. They might prefer to pay for waste transportation services, feeling that this action is sufficient to contribute to environmental care [21]. Understanding these multifaceted relationships is crucial for developing policies that effectively address the diverse factors influencing waste management behavior. By considering these complexities, policymakers can craft interventions that encourage responsible waste management practices across various income levels, fostering a cleaner and healthier environment for all.

4.3. Social Environment

This research underscores the crucial role of social environmental factors in shaping individual and community behavior related to waste management behavior. The study's results reveal that the majority of respondents with a good enough social environment tend to exhibit good household waste management behavior, whereas a small proportion of respondents living in a not good social environment display poor waste management behavior. The Chi-Square correlation test, yielding a p-value of 0.011, confirms the significant relationship between the social environment and waste management behavior on Lakkang Island.

These findings emphasize the impact of social norms and influences from the surrounding environment on individual and community behavior concerning waste management. Positive interactions and socialization with neighbors and the community regarding environmental cleanliness serve as encouragement and motivation for individuals to enhance household waste management practices. Consequently, initiatives focused on increasing awareness through social campaigns, training programs,

and participatory activities at the community level can prove effective strategies in this context.

This research aligns with findings in Bekasi, where there is a significant relationship between the social environment and household waste management behavior [22]. Therefore, a profound understanding of the dynamics of the social environment can serve as the foundation for policy planning aimed at improving household waste management behavior in society. By creating a supportive and motivating social environment, there is hope that the community will become more active and engaged in sustainable household waste management efforts on Lakkang Island and its surrounding areas.

4.4. Physical Facilities

This study delves into the availability of physical facilities, specifically the presence of rubbish bins or temporary shelter facilities (TSF) in people's residences, as a crucial factor in household waste management behavior. Although the research results indicate that the majority of respondents have access to physical facilities like trash bins or TPF, the Chi-Square statistical test with a p-value of 0.449 ($p > 0.05$) suggests there is no significant relationship between the availability of these facilities and household waste management behavior in the studied population.

These findings emphasize the complexity of factors influencing household waste management behavior. While physical facilities are essential, other elements such as public awareness, education, and environmental policy might play a more dominant role in shaping individual behaviors related to waste management. This aligns with previous studies, such as Yulianto [23], which found no relationship between waste disposal facilities and waste management behavior. The other research, Nurin et al. [24], indicates that waste disposal facilities in urban and rural areas do not significantly influence waste management. However, contrasting results, like those from Windasari et al. [25], suggest that facility availability does impact community behavior in waste management, illustrating the variability in outcomes across different contexts. The lack of physical facilities, such as separate waste bins, poses a challenge in processing waste, particularly in waste sorting [26].

Certainly, the presence of waste banks is a significant physical facility that positively influences waste management behavior in communities. Waste banks provide a structured system for collecting, segregating, and recycling waste materials. By encouraging individuals to deposit their recyclable waste at these facilities, waste banks not only promote recycling but also contribute to environmental sustainability [27].

The proposed approach to waste management on Lakkang Island aligns with sustainable principles, emphasizing managing waste at the source and transforming it into compost, reducing both waste volume

and environmental impact. However, the lack of a final disposal site on the island poses challenges. To address this, adopting successful waste management methods from other places, such as Pulau Seribu in Jakarta City, could be a viable solution [28]. Strategies like using special ships for plastic waste collection and processing can be adapted for Lakkang Island.

This approach not only tackles plastic waste pollution but also engages local communities in waste management, creating a cleaner and sustainable environment. Implementing such a strategy on Lakkang Island can serve as an inspiration for other small islands facing similar challenges. Sharing the knowledge and experiences gained can foster a collaborative effort toward effective waste management, promoting clean and sustainable environments in various island communities.

5. Conclusions

Based on the results of this research, it can be concluded that the knowledge and social environment of respondents have a significant influence on waste management behavior. In contrast, income level and availability of physical facilities do not have a significant influence on people's behavior in waste management on Lakkang Island, Makassar City. These results provide valuable insight into the factors that influence waste management behavior in these environments.

Acknowledgment

The author would like to thank LPPM Hasanuddin University for facilitating and financing this activity through contract number: 00323/UN4.22/PT.01.03/2023 as well as all parties who cannot be mentioned one by one who have provided support and assistance, suggestions, constructive criticism both in verbal and written form so that this activity can be completed well.

REFERENCES

- [1] C. Ram, A. Kumar, and P. Rani, "Municipal solid waste management: a review of waste to energy (WtE) approaches," *Bioresources*, vol. 16, no. 2, p. 4275, 2021. <https://bioresources.cnr.ncsu.edu/resources/municipal-solid-waste-management-a-review-of-waste-to-energy-wte-approaches/>
- [2] BPS (Badan Pusat Statistik [Central Statistics Agency]), "Statistik Lingkungan Hidup Indonesia [Indonesian Environmental Statistics]," Jakarta, 2022. <https://www.bps.go.id/publication/2022/11/30/eb06d1c8e37285cac10c3086/statistik-lingkungan-hidup-indonesia-2022.html>
- [3] KLHK (Kementerian Lingkungan Hidup dan Kehutanan [The Ministry of Environment and Forestry]), "Jumlah Timbulan Sampah Tahun 2022 [Total Waste Generation in 2022]," 2022. <https://sipsn.menlhk.go.id/sipsn/public/data/timbulan>
- [4] A. S. Indrawan, "Pengelolaan Sampah Secara Reduce, Reuse, Dan Recycle (3r) Pada Masyarakat Di Fukuoka Seibu Plaza, Jepang [Waste Management by Reduce, Reuse and Recycle (3r) in the Community in Fukuoka Seibu Plaza, Japan]," Universitas Hasanuddin, Makassar, 2019. <http://repository.unhas.ac.id/id/eprint/5015/>
- [5] S. Wang, J. Wang, S. Yang, J. Li, and K. Zhou, "From intention to behavior: Comprehending residents' waste sorting intention and behavior formation process," *Waste Management*, vol. 113, pp. 41–50, 2020. <https://doi.org/10.1016/j.wasman.2020.05.031>
- [6] M. Marwati, A. E. Oktawati, and R. Rasdyana, "Karakter Aktivitas Masyarakat Di Wilayah Pesisir Daratan (Studi Kasus: Permukiman Delta Lakkang-Makassar) [Character of Community Activities in Mainland Coastal Areas (Case Study: Lakkang-Makassar Delta Settlements)]," *Teknosains: Media Informasi Sains dan Teknologi*, vol. 15, no. 1, pp. 34–47, 2021. <https://doi.org/10.24252/teknosains.v15i1.17680>
- [7] Latief and A. R. Rasyid, "Penataan Kawasan Wisata Lakkang Berbasis Masyarakat [Community Based Arrangement of the Lakkang Tourism Area]," *JURNAL TEPAT: Teknologi Terapan untuk Pengabdian Masyarakat*, vol. 4, no. 1, pp. 1–10, 2021. https://doi.org/10.25042/jurnal_tepat.v4i1.150
- [8] D. Sugiyono, "Metode penelitian pendidikan pendekatan kuantitatif, kualitatif dan R&D [Quantitative, qualitative and R&D approaches to educational research methods]," Alfabeta, pp. 1–456, 2013.
- [9] S. Notoatmodjo, "Ilmu perilaku kesehatan [The science of health behavior]," Rineka Cipta, pp. 1–74, 2014.
- [10] A. F. Rangkuti and M. E. Safitri, "Hubungan Tingkat Pendidikan, Pengetahuan Dan Sikap Dengan Perilaku Pengelolaan Sampah Pada Pedagang Buah Dan Sayur Di Pasar Giwangan Yogyakarta [The Relationship between Level of Education, Knowledge, and Attitudes with Waste Management Behavior among Fruit and Vegetable Traders at Giwangan Market, Yogyakarta]," *Jurnal Kesehatan dan Pengelolaan Lingkungan*, vol. 3, no. 2, pp. 56–65, 2022. <http://journal2.uad.ac.id/index.php/jkpl/article/view/6331>
- [11] W. R. Hasibuan, "Hubungan Sikap Dan Pengetahuan Masyarakat Terhadap Sistem Pengelolaan Sampah Di Desa Sei Semayang Kecamatan Sunggal Tahun 2019 [The Relationship between Community Attitudes and Knowledge of the Waste Management System in Sei Semayang Village, Sunggal District, 2019]," Universitas Islam Negeri Sumatera Utara, Medan, 2019. <http://repository.uinsu.ac.id/8174>
- [12] N., Istiqomah and W. Wulandari, "Hubungan Pengetahuan Dan Pendidikan Terhadap Perilaku Ibu Rumah Tangga Dalam Mengelola Sampah Rumah Tangga Di Dusun Sigempol Desa Randusanga Kulon Kecamatan Brebes [The Relationship between Knowledge and Education towards the Behavior of Housewives in Managing Household Waste in Sigempol Hamlet, Randusanga Kulon Village, Brebes District]," Universitas Muhammadiyah Surakarta, Surakarta, 2020. <https://eprints.ums.ac.id/id/eprint/82024>

- [13] Padmita, N. L. P., & Marwati, N. M., "Hubungan Tingkat Pengetahuan Dan Keberadaan Tempat Sampah Dengan Tindakan Ibu Rumah Tangga Dalam Pemilahan Sampah [The Relationship Between The Level Of Knowledge And The Existence Of Trash Bins With The Actions Of Housewives In Sorting Waste]," *Jurnal Kesehatan Lingkungan*, vol. 9, no. 2, pp.161-170, 2019. <https://ejournal.poltekkes-denpasar.ac.id/index.php/JKL/article/view/911>
- [14] D. M. Syam, "Hubungan Pengetahuan Dan Sikap Masyarakat Dengan Pengelolaan Sampah Di Desa Loli Tasiburi Kecamatan Banawa Kabupaten Donggala [The Relationship Between Community Knowledge And Attitudes And Waste Management In Loli Tasiburi Village, Banawa Sub-District, Donggala District]," *HIGIENE: Jurnal Kesehatan Lingkungan*, vol. 2, no. 1, pp. 21–26, 2016. <https://journal3.uin-alauddin.ac.id/index.php/higiene/article/view/1802>
- [15] A. Azwar, *Pengantar Ilmu Lingkungan (Revisi) [Introduction to Environmental Science (Revised)]*, MSW, pp. 1-184, 2021.
- [16] W. Wahyu, "Hubungan Antara Pengetahuan dan Sikap dengan Tindakan Petugas Kesehatan dalam Upaya Pengelolaan Sampah Medis di Rumah Sakit Griya Husada Madiun Tahun 2017 [The Relationship Between Knowledge and Attitude with Health Workers' Actions in Medical Waste Management Efforts at Griya Husada Madiun Hospital in 2017]," *STIKES BHAKTI HUSADA MULIA*, Madiun, 2017. <https://repository.stikes-bhm.ac.id/96/>
- [17] T. Anditora and A. Ahmadun, "Pengaruh Kualitas Produk dan Harga terhadap Minat Beli Tas Sam Collection Jakarta Timur [The Influence of Product Quality and Price on Intention to Buy Sam Collection Bags, East Jakarta]," *Jurnal Administrasi dan Manajemen*, vol. 9, no. 1, pp. 68–77, 2019. <https://ejournal.urindo.ac.id/index.php/administrasimanajemen/article/view/329>
- [18] H. Ridha, N. S. Prihatini, and M. Firmansyah, "Pola Pengelolaan Sampah Rumah Tangga Di Sepanjang Aliran Sungai Pekapuran–Banjarmasin [Household Waste Management Patterns Along the Pekapuran–Banjarmasin River]," *Jernih: Jurnal Tugas Akhir Mahasiswa*, vol. 1, no. 2, pp. 67–80, 2018. <https://doi.org/10.20527/jernih.v1i2.579>
- [19] R. Jayanti, P. I. Christiawan, and I. M. Sarmita, "Pengaruh Tingkat Pendidikan dan Tingkat Pendapatan Terhadap Bentuk Pengelolaan Sampah Aorganik Rumah Tangga di Desa Alasanger [The Influence of Education Level and Income Level on the Form of Household Aorganic Waste Management in Analisisger Village]," *Jurnal Pendidikan Geografi Undiksha*, vol. 5, no. 2, 2017. <https://doi.org/10.23887/jjppg.v5i2.20662>
- [20] M. Lee, H. Choi, and Y. Koo, "Inconvenience cost of waste disposal behavior in South Korea," *Ecological Economics*, vol. 140, pp. 58–65, 2017. <https://doi.org/10.1016/j.ecolecon.2017.04.031>
- [21] H. Harun, "Gambaran Pengetahuan Dan Perilaku Masyarakat Dalam Proses Pemilahan Sampah Rumah Tangga Di RW 06 Desa Hegarmanah [Overview of Community Knowledge and Behavior in the Process of Sorting Household Waste in Neighbourhood 06 Hegarmanah Village]," *Dharmakarya*, vol. 6, no. 2, 2017. <https://journal.unpad.ac.id/dharmakarya/article/view/14789>
- [22] G. A. Kurnialesanti, "Hubungan Pengetahuan, Lingkungan Sosial Dengan Partisipasi Masyarakat Dalam Pengelolaan Sampah Rumah Tangga Di Bintang Metropol Kota Bekasi [The Relationship between Knowledge, Social Environmental with Community Participation in Household Waste Management in Bintang Metropol Bekasi City]," Universitas Negeri Jakarta, Bekasi, 2017. <http://repository.unj.ac.id/id/eprint/25853>
- [23] B. Yulianto, "Partisipasi Pedagang Dalam Melakukan Pemilahan Sampah di Pasar Baru Kecamatan Tampan Kota Pekanbaru [Participation of Traders in Sorting Waste in Pasar Baru, Tampan District, Pekanbaru City]," *Jurnal Kesehatan Komunitas*, vol. 3, no. 2, pp. 69–72, 2016. <https://jurnal.htp.ac.id/index.php/keskom/article/view/105>
- [24] A. Nurin, M. N. Rhomadhoni, and A. Syafiuddin, "Pengaruh Karakteristik Masyarakat dan Fasilitas Pembuangan Sampah dengan Pengolahan Sampah di Perkotaan dan Pedesaan [The Influence of Community Characteristics and Waste Disposal Facilities with Waste Processing in Urban and Rural Areas]," *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, vol. 11, no. 4, pp. 731–738, 2021. <https://journal.stikeskendal.ac.id/index.php/PSKM/article/view/1788>
- [25] S. Windasari, "Hubungan Kebiasaan Dan Ketersediaan Sarana Dengan Perilaku Masyarakat Dalam Membuang Sampah Di Bantaran Sungai Kelurahan Brang Biji Kecamatan Sumbawa Tahun 2020 [The Relationship between Habits and Availability of Facilities with Community Behavior in Disposing of Garbage on the Riverbanks of Brang Biji Village, Sumbawa District, 2020]," *Jurnal Kesehatan Dan Sains*, vol. 4, no. 1, pp. 106–115, 2020. <http://jurnal.lppmstikesghs.ac.id/index.php/jks/article/view/66>
- [26] Mohamed, K. Izydorczyk, A. Ahmed, M. Ibrahim, and G. Jackson, "Trialing Household Waste Segregation in Island Communities of the Maldives," *Pract Anthropol*, vol. 45, no. 2, pp. 32–39, 2023. <https://doi.org/10.17730/0888-4552.45.2.32>
- [27] D. Choirrunnisa and N. Ngatindriatun, "The Impact of Waste Bank on Waste Processing Behavior and Income," *Efficient: Indonesian Journal of Development Economics*, vol. 4, no. 2, pp. 1201–1216, 2021. <https://doi.org/10.15294/efficient.v4i2.46061>
- [28] V. P. Swastitanaya and H. A. Kurniawati, "Desain Kapal Pengangkut dan Pengolah Sampah Plastik untuk Kepulauan Seribu [Design of Plastic Waste Transport and Processing Ships for the Thousand Islands]," *Jurnal Teknik ITS*, vol. 9, no. 2, pp. G61–G67, 2021. DOI: 10.12962/j23373539.v9i2.54191