



The Influence of Institutional and Regulatory Aspects and Information on Waste Management on Community Intention to Support Waste Management in the Kahayan River Basin, Central Kalimantan

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ABSTRACT

Disposing of domestic waste into the river remains a common practice among the majority of residents along the Kahayan River in Palangka Raya City impacting pollution, flooding, and public health. This study aims to analyze variables influencing people's intention to support domestic waste management activities. The study was conducted in Mendawai and Flamboyan Bawah, densely populated settlements on the banks of the Kahayan River in Palangka Raya City. One hundred respondents were selected with a non-probability technique and interviewed to obtain information on infrastructure (X_1), economy (X_2), location (X_3), institutions and regulations (X_4), and waste management information (X_5) aspects. Descriptive statistics was utilized to understand respondent characteristics and Structural Equation Model-Partial Least Square (SEM-PLS) was applied to determine the effect of each variable. This study found that the majority of respondents were women ($n = 44$), housewives ($n = 40$), and over 35 years old ($n = 46$). The analysis results show that increasing the information aspect of waste management will increase the community's intention to support domestic waste management activities by 40.1% ($P = 0.001$). Meanwhile, increasing the institutional and regulatory aspects has an effect of 29.2% ($P = 0.002$). The other three variables did not show significant results ($P > 0.05$). The results of this study-reveal that the community's intention to support domestic waste management activities is influenced by the informational, institutional and regulatory aspects. Establishing community-based institutions that able to provide ongoing support presents a viable strategy for promoting sustainable behavioral change.

Membuang sampah domestik ke sungai masih menjadi perilaku mayoritas masyarakat di sepanjang aliran Sungai Kahayan di Kota Palangka Raya, sehingga berdampak pada pencemaran, banjir, dan kesehatan masyarakat. Penelitian bertujuan menganalisis variabel-variabel yang mempengaruhi niat masyarakat untuk mendukung kegiatan pengelolaan sampah domestik. Penelitian kuantitatif dilaksanakan di Mendawai dan Flamboyan Bawah, merupakan pemukiman padat di tepi Sungai Kahayan Kota Palangka Raya. Seratus orang responden dipilih non-probability dan diwawancarai untuk memperoleh informasi tentang aspek infrastruktur (X_1), ekonomi (X_2), lokasi (X_3), kelembagaan dan regulasi (X_4), informasi pengelolaan sampah (X_5). Statistik deskriptif digunakan untuk mendapatkan karakteristik responden dan *Structural Equation Model-Partial Least Square* (SEM-PLS) diterapkan untuk mengetahui pengaruh setiap variabel penelitian. Hasil penelitian mendapatkan bahwa mayoritas responden adalah perempuan ($n = 44$), ibu rumah tangga ($n = 40$), dan berusia diatas 35 tahun ($n = 46$). Hasil analisis menunjukkan bahwa peningkatan aspek informasi pengelolaan sampah akan meningkatkan niat masyarakat untuk mendukung kegiatan pengelolaan sampah domestik sebesar 40,1% ($P = 0,001$). Sementara peningkatan aspek kelembagaan dan regulasi memberikan pengaruh sebesar 29,2% ($P = 0,002$). Tiga variabel lainnya tidak menunjukkan hasil yang signifikan ($P > 0,05$). Hasil penelitian mendapatkan bahwa niat masyarakat untuk mendukung kegiatan pengelolaan sampah domestik dipengaruhi oleh aspek informasi pengelolaan sampah serta aspek kelembagaan dan regulasi. Pembentukan lembaga kemasyarakatan yang dapat mendampingi masyarakat secara berkelanjutan menjadi alternatif untuk perubahan perilaku masyarakat.

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1. Introduction

Rivers are the most important water resources for human consumption, agriculture, industry, and biodiversity conservation (Cao et al., 2022; Gifford et al., 2018). Dumping domestic waste and garbage into rivers is a very detrimental behavior because it has an impact on decreasing water quality (physical, chemical, biological), eutrophication, flooding due to shallowing and obstruction of river flow rates, and disease transmission (Bakri & Yushananta, 2023; Cao et al., 2022; Kospa, 2018; Novrianti, 2016).

The Kahayan River (Great Dayak River) is the main river in Central Kalimantan that divides the city of Palangka Raya. This river has been the lifeblood of Palangka Raya for centuries (Wikipedia, 2024). Currently, around 15% of the population of Palangka Raya City lives on the Kahayan Riverbank (Astoeti et al., 2021). The residential structure of the Kahayan Riverbank area is above the river with the characteristics of raft houses, pillar houses, and concrete (permanent) houses (Astoeti et al., 2021).

One common practice among residents living along the Kahayan River is the disposal of domestic waste directly into the river. Meanwhile, the river water is also used for bathing, washing, and sanitation purposes. Despite several efforts to change the behavior (providing education, waste management training, and providing trash bins), the behavioral changes are only temporary (Triyani & Syarpin, 2022).

Several studies reported that community behavior in waste management is influenced by both internal and external factors. The study results of Yulida et al.'s (2016) in the Batang Bakarek-karek river basin, Padang Panjang City found that attitude was the variable that most influenced community behavior in managing waste. Meanwhile, Mawardi et al. (2022) in a study conducted in Gucialit Village, Lumajang Regency, identified three variables: duration of residence, level of education, and income. Community waste management practices are also influenced by the availability of facilities and infrastructure, location, exposure to information, and regulations

(Mahyudin, 2017; Mas'ulatul Janah, 2021; Rimandani et al., 2023; Sholihah & Hariyanto, 2020; Widiyanto et al., 2020).

Until now, to the best of our knowledge, there has been no report that specifically examines the community's intention to support domestic waste management activities in the Kahayan River basin. This study aims to analyze the variables that influence the community's intention to support domestic waste management activities.

2. Methods

Quantitative research was conducted from February to April 2024, in Flamboyan and Mendawai Markets, densely populated settlements on the banks of the Kahayan River. Both research locations were in the Pahandut District and Jekan Raya District.

The study population is all residents living in two sub-districts (N = 260,803 people). A total sample of 100 people was selected based on a 10% margin of error, using the Slovin formula (Darwin et al., 2021).

The instrument was developed based on a review of relevant literature. Attitude were assessed using a five-point Likert Scale (1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree). The instrument was subsequently tested for validity and reliability by involving 30 residents from outside the study area, but had similar regional characteristics.

Data collection was carried out by visiting each respondents from house to house. All collected data were then analyzed in stages. Descriptive analysis was conducted to obtain information on the respondents' demographic characteristics. SEM-PLS was performed with WarpPLS 6.0 software to determine the variables influencing people's intention to support domestic waste management.

2.1. Hypothesis model

This study assessed the influence of infrastructure variables (X₁), economy (X₂), location (X₃), institutions and regulations (X₄), waste management information (X₅) on community

intention to support domestic waste management (Y). The developed hypothesis is illustrated in Figure 1.

2.2. Solution model

Analysis using the *Structural Equation Model-Partial Least Square* (SEM-PLS) method has two model equations: the measurement model

equation and the structural model equation. Following Celik et al. (2014), the equation of the structural model is as follows:

$$\eta = \beta\eta + G + \zeta \quad (2)$$

The basic equation for the measurement model is:

$$x = \Lambda_x \xi + \delta \quad (3)$$

$$y = \Lambda_y \eta + \varepsilon \quad (4)$$

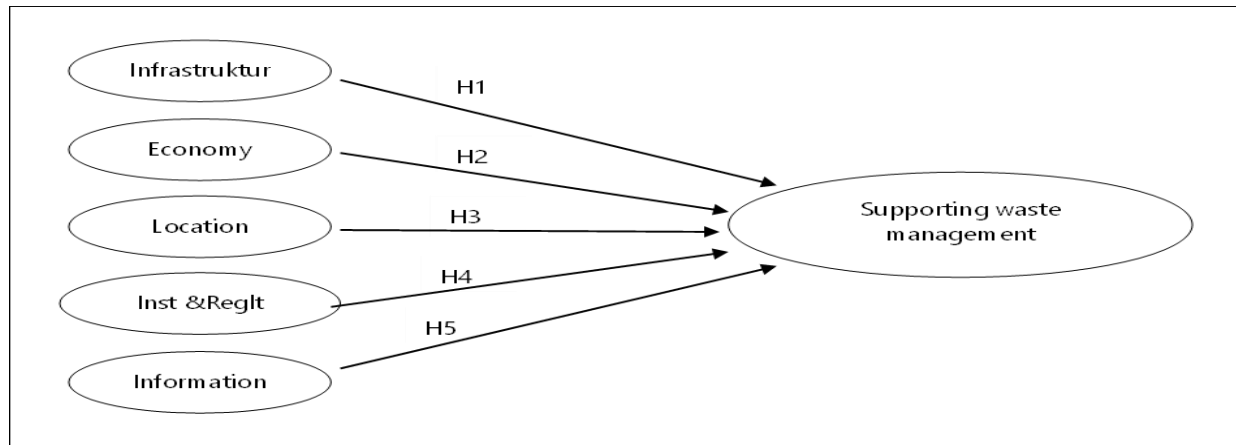


Figure 1. Hypothesis model

3. Results

The study results (Table 1) show that female respondents (n=56) were more numerous than male respondents. The majority of participants were permanent residents (n=84), housewives (n=40), and over 35 years old (n=46).

Table 1. Demographic characteristics

No	Variables	F
1	Gender	
	Woman	56
	Man	44
2	Type of Residence	
	Settling	84
	Temporary	16
3	Work	
	Housewife	40
	Governance/Civil Apparatus	10
	Self-employed	35
	Other	5
4	Age	
	18 -25 years	16
	25 - 35 years	17
	> 35 Years	46

3.1. The linearity assumption test

Linearity is an assumption that must be met in Partial Least Square (PLS). The analysis results (Table 2) showed that all variables were linear ($P > 0.05$). Therefore, the Partial Least Square (PLS) method was applicable.

3.2. Validity on reflective indicators test

Individual indicators are considered valid if they exhibit an outer loading score greater than 0.7 or a T-statistic score more than 1.96 with a significant level of $P < 0.05$. However, indicators with outer loading score above 0.50 are still regarded as having moderate validity and may be retained for further analysis (Budhi, 2018). As shown in Table 3, all indicators demonstrated outer loading values exceeding 0.50 with $P < 0.05$ indicating that all individual indicators were valid.

Table 2. Linearity test

No	Exogenous Variables	Endogenous Variables	F	P
1	Infrastructure aspects (X ₁)	Community intention	0.132	0.717
2	Economic aspect (X ₂)	to support waste	1,912	0.170
3	Location aspect (X ₃)	management (Y)	0.435	0.649
4	Institutional and regulatory aspects (X ₄)		1,562	0.141
5	Information of waste management aspects (X ₅)		1,895	0.119

3.3. Composite reliability outer model test

An indicator is said to have good internal consistency if the composite reliability and Cronbach's Alpha scores for the corresponding latent variable exceed 0.6. As presented in Table 4, both composite reliability and Cronbach's Alpha scores for each variable were greater than 0.6. Therefore, it can be concluded that the indicators associated with each latent variable demonstrate good internal consistency (Kock, 2019) .

3.4. Structural model test

The result of the structural model analysis (Table 5) indicated that 30.6% of the variance in the dependent variables was explained by the independent variables ($R^2 = 0.306$). Two variables were found to have a statistically significant influence: the institutional and regulatory aspects ($P = 0.002$), and the waste management information aspects ($P = 0.001$). The institutional and regulatory aspects contributed 29.2 % to the increase in community intention, while the waste

management information aspect contributed 40.1%.

Table 3. Convergent validity test

No	Indicator	Outer Loading	P	
1	X11	1.00	0.000	Valid
2	X12	1.00	0.000	Valid
3	X13	1.00	0.000	Valid
4	X21	1.00	0.000	Valid
5	X22	1.00	0.000	Valid
6	X23	1.00	0.000	Valid
7	X31	0.837	0.000	Valid
8	X32	0.837	0.000	Valid
9	X41	0.835	0.000	Valid
10	X42	0.735	0.000	Valid
11	X43	0.576	0.000	Valid
12	X44	0.695	0.000	Valid
13	X51	0.813	0.000	Valid
14	X52	0.675	0.000	Valid
15	X53	0.883	0.000	Valid
16	Y1	0.826	0.000	Valid
17	Y2	0.810	0.000	Valid
18	Y3	0.913	0.000	Valid
19	Y4	0.911	0.000	Valid

Table 4. Composite reliability of outer model test

Exogenous Variables	Composite Reliability	Cronbach's Alpha	Avg. Var. Extract	
Infrastructure aspects (X ₁)	<u>1</u>	<u>1</u>	<u>1</u>	Reliable
Economic aspect (X ₂)	<u>1</u>	<u>1</u>	<u>1</u>	Reliable
Location aspect (X ₃)	0.823	0.571	0.7	Reliable
Institutional and regulatory aspects (X ₄)	0.806	0.677	0.513	Reliable
Information aspects of waste management (X ₅)	0.836	0.702	0.632	Reliable

Table 5. Test of the direct influence model of the inner model

Exogenous Variables	Path Coefficient (ρ)	P	
Infrastructure aspects (X ₁)	-0.077	0.229	Not significant
Economic aspect (X ₂)	0.122	0.127	Not significant
Location aspect (X ₃)	- 0.02	0.425	Not significant
Institutional and regulatory aspects (X ₄)	0.292	0.002	Significant
Information aspects of waste management (X ₅)	0.401	0.001	Significant

4. Discussion

This study involved 100 respondents, the majority of whom were women ($n = 56$), over 35 years old ($n = 46$), worked as housewives ($n = 40$), and were permanent residents ($n = 84$). These findings indicate that women tend to spend more time at home compared to men. Therefore, information dissemination and educational intervention related to domestic waste management should prioritize involve women and housewives. As noted by Setyawati & Priyo Siswanto (2020) and Asteria & Heruman (2016), women play strategic role in environmental management.

The results of this study (Table 5) showed that the variables most strongly influencing the community's intention to support domestic waste management were institutional and regulatory aspects ($p = 29.2\%$; $P = 0.002$), and the waste management information aspects ($p = 40.1\%$; $P = 0.001$). These findings are consistent with Martiyani et al. (2023), that waste management behavior is influenced by the lack of socialization ~~to~~ within the community. This highlights the need to increase the socialization of qualified waste management through periodic counseling. According to Angriani et al. (2018), to preserve the Kuin River water in Banjarmasin, good coordination and collaboration between the government and the community regarding regulations on river water conservation are needed.

The findings of this study were also in accordance with Mas'ulatul Janah (2021), that information (including socialization, education, and training) is the most influential variable on the community's intention to support waste management in the Brantas River basin. Similarly, Gu & Ma (2013) observed that in China, population with limited awareness often engage in improper waste disposal. They concluded that ~~so~~ educational and social activities are essential for cultivating environmental responsibility and reducing littering behavior.

This study found (Table 6) that three variables did not show a significant effect on community intention to support domestic waste management activities, namely infrastructure aspects ($p = -7.7\%$; $P = 0.229$), economic aspects ($p = 12.2\%$; $P = 0.127$), and location aspects ($p = -2.0\%$; $P = 0.425$). These

findings were different from previous research reports, where attitudes, facilities and infrastructure variables influenced community behavior in waste management (Mahyudin, 2017; Mas'ulatul Janah, 2021; Rimandani et al., 2023; Sholihah & Hariyanto, 2020; Widiyanto et al., 2020; Yulida et al., 2016).

Based on the observation results, trash bins were available around the community settlements. Unfortunately, they were not utilized properly. This condition shows a lack of public understanding in domestic waste management. To foster and enhance community participation in domestic waste management, it is fundamental to establish a community-based institution or group comprising members of the local community (including housewives and youth) as well as representatives from the village government. Such an institution would serve as a platform for dialogue, coordination, and capacity building efforts on domestic waste management.

This community-based group is expected to take an active role in creating and implementing local regulations, thereby fostering a culture of compliance in domestic waste management. According to Tiaraningrum & Pratama (2022), effective waste management must actively involve community participation. Establishing a dedicated institution responsible for ongoing mentoring, coaching, and training in waste management is essential. Such an initiative is expected to drive behavioral change among residents, particularly in discouraging the practice of disposing of waste into rivers.

5. Conclusions

The findings of this study indicate that the community's intention to support domestic waste management activities is significantly influenced by two key factors: institutional and regulatory aspects ($P = 0.001$), and information aspects of waste management ($P = 0.001$). Improvements in institutional and regulatory aspects influenced were found to increase community intention by 29.2%, while enhancement in information aspects of waste management contributed to a 40.1% increase. These results highlight the crucial role of both structured governance and effective communication in promoting sustainable waste practice. Establishing community-based

institutions that continuously provide guidance, support, and training in domestic waste management a viable strategy for driving behavioral change, particularly in reducing the tendency to dispose of waste in rivers.

References

- Angriani, P., Sumarmi, Ruja, I. N., & Bachri, S. (2018). River management: The importance of the roles of the public sector and community in river preservation in Banjarmasin (A case study of the Kuin River, Banjarmasin, South Kalimantan – Indonesia). *Sustainable Cities and Society*, 43, 11–20. <https://doi.org/10.1016/j.scs.2018.08.004>
- Asteria, D., & Heruman, H. (2016). Bank Sampah Sebagai Alternatif Strategi Pengelolaan Sampah Berbasis Masyarakat di Tasikmalaya. *Jurnal Manusia Dan Lingkungan*, 23(1), 136. <https://doi.org/10.22146/jml.18783>
- Astoeti, D. D., Gumiri, S., Neneng, L., & Ardianoor. (2021). Relationship between water quality, sanitation and hygiene on environmental health of community settled on Kahayan River Bank, Palangka Raya. *IOP Conference Series: Earth and Environmental Science*, 886(1), 012067. <https://doi.org/10.1088/1755-1315/886/1/012067>
- Bakri, S., & Yushananta, P. (2023). Water Pollution and Water Quality Assessment of the Way Kuripan River in Bandar Lampung City (Sumatera, Indonesia). *Polish Journal of Environmental Studies*, 32(2), 1061–1070. <https://doi.org/10.15244/pjoes/153432>
- Budhi, S. (2018). *Analisis Statistik Multivariate Dengan Aplikasi SEM PLS SMARTPLS 3.2.6* (Pertama). Expert.
- Cao, M., Hu, A., Gad, M., Adyari, B., Qin, D., Zhang, L., Sun, Q., & Yu, C.-P. (2022). Domestic wastewater causes nitrate pollution in an agricultural watershed, China. *Science of The Total Environment*, 823, 153680. <https://doi.org/10.1016/j.scitotenv.2022.153680>
- Celik, E., Aydin, N., & Gumus, A. T. (2014). A multiattribute customer satisfaction evaluation approach for rail transit network: A real case study for Istanbul, Turkey. *Transport Policy*, 36, 283–293. <https://doi.org/10.1016/j.tranpol.2014.09.005>
- Darwin, M., Mamondol, M. R., Sormin, S. A., Nurhayati, Y., Tambunan, H., Sylvia, D., Adnyana, M. D. M., Prasetyo, B., Vianitati, P., & Antonius Adolf Gebang. (2021). *Metode Penelitian Pendekatan Kuantitatif Kualitatif* (T. S. Tambunan (Ed.); Issue June). Media Sains Indonesia.
- Gifford, M., Chester, M., Hristovski, K., & Westerhoff, P. (2018). Human health tradeoffs in wellhead drinking water treatment: Comparing exposure reduction to embedded life cycle risks. *Water Research*, 128, 246–254. <https://doi.org/10.1016/j.watres.2017.10.014>
- Gu, P., & Ma, X. (2013). Investigation and analysis of a floating population's settlement intention and environmental concerns: A case study in the Shawan River Basin in Shenzhen, China. *Habitat International*, 39, 170–178. <https://doi.org/10.1016/j.habitatint.2012.12.005>
- Kock, N. (2019). *WarpPLS User Manual: Version 6.0*. ScriptWarp Systems TM.
- Kospa, H. S. D. (2018). Kajian Persepsi dan Perilaku Masyarakat Terhadap Air Sungai. *Jurnal Tekno Global UIGM Fakultas Teknik*, 7(1). <https://doi.org/10.36982/jtg.v7i1.509>
- Mahyudin, R. P. (2017). Kajian Permasalahan Pengelolaan Sampah dan Dampak Lingkungan di TPA (Tempat Pemrosesan Akhir). *Jukung (Jurnal Teknik Lingkungan)*, 3(1), 66–74. <https://doi.org/10.20527/jukung.v3i1.3201>
- Martiyani, E., Jaksa, S., Ernyasih, E., & Andriyani, A. (2023). Faktor-Faktor yang Berhubungan dengan Pengelolaan Sampah pada Pedagang di Pasar Sepatan Kabupaten Tangerang Tahun 2022. *Environmental Occupational Health And Safety Journal*, 3(2), 125. <https://doi.org/10.24853/eohjs.3.2.125-140>
- Mas'ulatul Janah, F. (2021). Kajian Persepsi Masyarakat tentang Pengelolaan Sampah di Hilir Daerah Aliran Sungai Brantas. *Environmental Pollution Journal*, 1(2), 110–118. <https://doi.org/10.58954/epj.v1i2.13>
- Mawardi, Y. I., Dhokhikah, Y., & Listyawati, R. N. (2022). Kajian Pengelolaan Sampah Berbasis Masyarakat di Desa Gucialit, Kecamatan Gucialit, Kabupaten Lumajang. *Matrapolis: Jurnal Perencanaan Wilayah Dan Kota*, 3(1), 09. <https://doi.org/10.19184/matrapolis.v4i1.34534>
- Novrianti, N. (2016). Pengaruh Aktivitas Masyarakat di pinggir Sungai (Rumah Terapung) terhadap Pencemaran Lingkungan Sungai Kahayan Kota Palangka Raya Kalimantan Tengah. *Media Ilmiah Teknik Lingkungan*, 1(2), 35–39. <https://doi.org/10.33084/mitl.v1i2.144>
- Rimandani, Lubis, S. N., & Charloq. (2023). Perencanaan Pengembangan Pengelolaan Sampah di Bantaran Sungai Alas Desa Kutacane

- Lama Kabupaten Aceh Tenggara. *Jurnal Intervensi Sosial Dan Pembangunan (JISP)*, 4(1), 1–8. <https://doi.org/10.30596/jisp.v4i1.13019>
- Setyawati, E. Y., & Priyo Siswanto, R. S. H. (2020). Partisipasi Perempuan Dalam Pengelolaan Sampah Yang Bernilai Ekonomi dan Berbasis Kearifan Lokal. *JAMBURA GEO EDUCATION JOURNAL*, 1(2), 55–65. <https://doi.org/10.34312/jgej.v1i2.6899>
- Sholihah, K. K. A., & Hariyanto, B. (2020). Kajian Tentang Pengelolaan Sampah di Indonesia. *Swara Bumi*, 3(3), 1–9. <https://ejournal.unesa.ac.id/index.php/swara-bhumi/article/view/35038>
- Tiaraningrum, N. B. P., & Pratama, Y. (2022). Peran Serta Masyarakat dalam Pengelolaan Sampah Rumah Tangga di Bantaran Sungai Cikapundung Kelurahan Maleer. *Jurnal Serambi Engineering*, 7(4), 3984–3993. <https://doi.org/10.32672/jse.v7i4.4883>
- Triyani, T., & Syarpin, S. (2022). Pemberdayaan masyarakat Daerah Aliran Sungai (DAS) Kahayan di Kelurahan Palangka Kota Palangka Raya melalui program Ecoliteracy. *Unri Conference Series: Community Engagement*, 4, 78–85. <https://doi.org/https://doi.org/10.31258/unricsce.4.78-85>
- Widiyanto, A. F., Zeha, H. N., Rahardjo, S., & Suratman, S. (2020). Faktor-Faktor yang Berpengaruh terhadap Praktik Masyarakat dalam Pengelolaan Sampah di Desa Ketenger, Kecamatan Baturaden, Kabupaten Banyumas. *Jurnal Kesehatan Lingkungan Indonesia*, 19(2), 76–81. <https://doi.org/10.14710/jkli.19.2.76-81>
- Wikipedia. (2024). Sungai Kahayan. In *Wikipedia*. https://id.wikipedia.org/wiki/Sungai_Kahayan
- Yulida, N., Suwarni, A., & Sarto, S. (2016). Analysis of community behavior on garbage disposing in Batang Bakarek-Karek river basin of Padang Panjang. *Berita Kedokteran Masyarakat*, 32(10), 373. <https://doi.org/10.22146/bkm.7298>