

Domestic Waste Disposal Behavior and Its Socio-Ecological Aftermath

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Abstract. *Domestic waste pollution in the Way Kuripan River has triggered serious ecological degradation. This study aims to analyze the physicochemical characteristics of the water and the socio-environmental impacts on the riverbank community. Using a descriptive quantitative approach, this study integrates water quality data with primary data from 98 respondents selected via purposive sampling. The results reveal an ecological decoupling phenomenon: the river's physical stability is maintained with low TSS (18 mg/L), yet it suffers from severe hypoxic pressure (DO 3 mg/L) and high organic load COD (25 mg/L), failing to meet Class I Quality Standards. Low Fecal Coliform levels (14 MPN/100mL) confirm the dominance of grey water pollutants. Socially, a critical knowledge-behavior gap was found, despite high literacy, 77% of residents discharge waste directly into the river. Spearman Rank correlation tests showed no significant relationship ($p=0,120$) between risk perception and behavior, confirming that pollution is driven by structural barriers, specifically the lack of sanitation infrastructure reported by 82% of respondents, rather than low awareness. This condition causes social displacement and a high prevalence of health complaints (94%).*

Keywords: *Grey water, River water quality, Structural barriers, Knowledge-behavior gap, Way Kuripan River.*

1. Introduction

River water pollution caused by domestic activity is a major environmental issue in urban areas, particularly in regions where population growth and settlement expansion are not matched by the provision of adequate sanitation infrastructure. In Indonesia, this problem is prevalent in both large and medium-sized cities, including Bandar Lampung. The Way Kuripan River is a water body experiencing significant pollution pressure, primarily from domestic waste generated by the community in Kuripan Urban Village. Domestic waste flowing into the river originates from kitchens, bathrooms, laundry, and untreated feces, causing significant changes in water quality parameters such as COD, BOD, phosphate, nitrate, and Total Dissolved Solids (TDS) (Bakri & Yushananta, 2023).

Globally, studies indicate that domestic waste is the primary source of river pollution in developing countries. According to (Soewondo, Handajani, & Rosalina, 2022), more than 60–80% of the pollutant load in urban rivers in South Asia and Southeast Asia originates from household activities. Organic matter and nutrients, such as phosphate from detergents and nitrogen from domestic wastewater, have the potential to trigger eutrophication, which degrades aquatic ecosystem quality and threatens aquatic biota (Rout, Shahid, Dash, Bhunia, & Liu, 2021). Furthermore, changes in physical and chemical water parameters can increase health risks for the surrounding community. The WHO reports that communities exposed to contaminated surface water are prone to

diarrhea, dermatitis, gastrointestinal infections, and other skin disorders.

In Indonesia, regulations regarding water quality management are established in Government Regulation (PP) No. 22 of 2021 and the Minister of Environment and Forestry Regulation No. 68 of 2016 concerning Domestic Wastewater Quality Standards. Although this regulatory framework establishes water quality standards based on usage classes, implementation at the settlement level is often hindered by low community compliance, limited sanitation infrastructure, and weak environmental supervision. Previous research also indicates that communities often lack alternative waste disposal systems other than channeling waste into drainage systems that empty directly into rivers, causing chronic pollution in water bodies (Sembiring & Safithri, 2021).

Beyond biophysical impacts, river pollution also affects the social aspects of riverbank communities. A study by (Sado-Inamura & Fukushi, 2018) revealed that river water pollution reduces the quality of life, disrupts social activities, and causes psychological stress due to foul odors, environmental aesthetic degradation, and increased health risks. These conditions are also observed in the Way Kuripan riverbank community, which reports health disturbances, discomfort, and the loss of the river's social function as an interaction space.

Although numerous studies have discussed river water quality in Indonesian urban areas, studies specifically integrating water quality conditions with social impact analysis remain limited, especially on a local scale like the Way Kuripan River. Most previous research focuses on chemical and physical aspects of water quality without linking them to the perceptions, experiences, and social conditions of riverbank communities. Thus, there is a need for comprehensive, evidence-based research to understand the nexus between domestic waste disposal, water quality degradation, and socio-environmental impacts on the surrounding community.

2. Method

This study utilizes a descriptive quantitative approach to analyze the socio-environmental impacts of domestic waste disposal in Kuripan Urban Village. The sample consists of 98 respondents selected through purposive sampling based on their proximity to the Way Kuripan River flow. Primary data was obtained through Likert-scale questionnaires regarding waste disposal behavior and the social impacts felt by the community. Secondary data, consisting of water quality test results (temperature, pH, TDS, BOD, COD, nitrate, phosphate), was sourced from the Bandar Lampung City Environmental Agency (DLH) for the year 2024. Data were analyzed descriptively and compared against the quality standards of PP No. 22 of 2021. Additionally, a Spearman's Rank correlation test was conducted to examine the relationship between waste disposal behaviour and socio-environmental impacts.

3. Results and Discussion

3.1. Environmental Conditions of Way Kuripan River

Table 1 shows that the environmental conditions of the water and the upstream catchment area of the Way Kuripan River exhibit contradictory ecological characteristics: physical land stability versus chemical water degradation. Geomorphologically, the upstream environment maintains good land cover integrity, indicated by a low Total Suspended Solid (TSS) value (18 mg/L), reflecting minimal soil erosion rates into the water body.

However, this physical stability is not accompanied by healthy aquatic metabolism,

the river ecosystem experiences serious hypoxic pressure with Dissolved Oxygen levels of only 3 mg/L (50% below the Class I minimum standard of PP No. 22 of 2021) (PP No.22, 2021). This aquatic environment is burdened by persistent organic material inputs, marked by a COD value (25 mg/L) exceeding the threshold by 2.5 times. Specifically, this pollution profile indicates that environmental pressure does not stem from poor sanitation regarding fecal waste, given that Coliform bacteria levels are very low (14 MPN/100 mL) and meet quality standards. Instead, it is caused by the influx of non-fecal domestic liquid waste (grey water) rich in phosphate (0.2 mg/L) and organic matter, transforming the upstream environment from a natural river into a chemically saturated ecosystem, despite appearing visually clear.

Table 1. Water Quality of Way Kuripan River

No.	Parameter	Unit	Value	Class I Standard (PP 22/2021)	Annotation
1.	TSS	mg/L	18	50	Compliant
2.	pH	-	8	6-9	Compliant
3.	DO	mg/L	3	6	Exceeded
4.	BOD	mg/L	4	2	Exceeded
5.	COD	mg/L	25	10	Exceeded
6.	Nitrate	mg/L	1	10	Compliant
7.	Total Phosphate	mg/L	0,2	0,2	Max Limit
8.	Fecal Coliform	MPN/100mL	14	100	Compliant

3.2. Waste Disposal Behavior

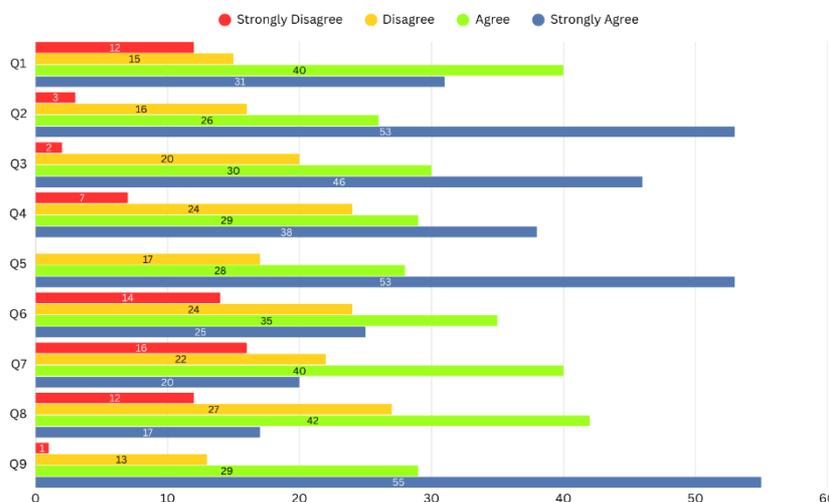


Figure 1. Waste Disposal Behavior Diagram

The analysis of community perceptions along the Way Kuripan River reveals a significant "knowledge-behavior gap" in domestic waste management. Although environmental literacy levels are adequate, where over 70% of respondents can identify waste types and understand regulations prohibiting disposal (Q1, Q2, Q6), this does not convert into pro-environmental action. The fact that 77% of respondents acknowledged the persistent practice of direct wastewater discharge into the river (Q3, Q4) indicates that pollution has undergone social normalization, a condition in which deviant environmental

behavior becomes perceived as acceptable due to the repetition of collective habits. This finding aligns with studies conducted along the Winongo River and the upper Citarum River (Wardhani & Pravitasari, 2024), which similarly reported the institutionalization of improper waste disposal practices within local communities

The persistence of this maladaptive behavior is not solely driven by cultural factors but is exacerbated by deficits in sanitation infrastructure. A total of 82% of respondents reported the absence of adequate wastewater disposal facilities (Q5), underscoring a failure in the on-site implementation of the Ministry of Environment and Forestry Regulation No. P.68/2016 (Permen LHK No. P.68, 2016). This mismatch between regulatory obligations and infrastructural realities compels communities to use the river as a de facto terminal disposal site. Interestingly, there is substantial social readiness for policy intervention, as indicated by the 85% of respondents who expressed support for stricter enforcement (Q9) and the 42.86% who have already initiated independent waste segregation practices (Q8). Therefore, the degradation of water quality in the Way Kuripan River does not merely reflect low individual awareness but rather represents a manifestation of structural barriers and the absence of supporting systems that force the emergence of environmentally destructive behaviors.

3.3. Social and Environmental Impacts

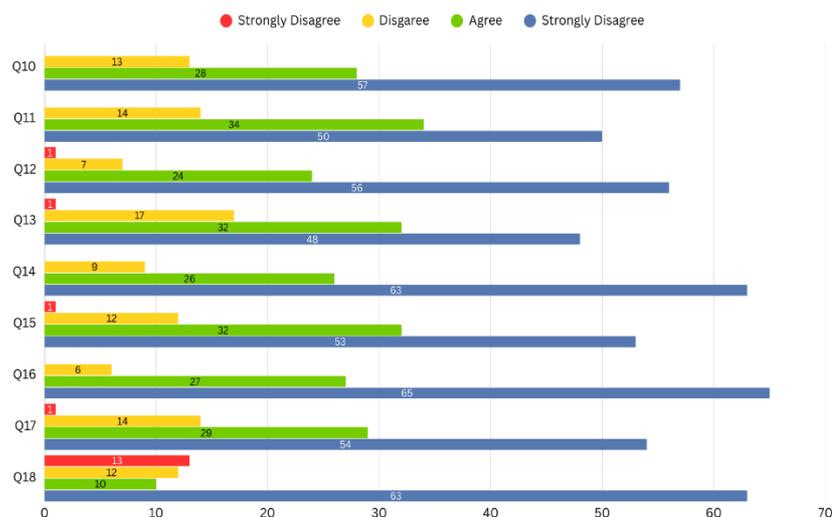


Figure 2. Social and Environmental Impact Diagram

The analysis of community perceptions (Q10–Q15) reveals a high degree of ecological sensitivity among residents living along the Way Kuripan River toward ongoing environmental degradation. A total of 87% of respondents accurately identified the river’s polluted status, validated by direct sensory experiences of physical indicators such as strong odor (80%) and the accumulation of solid waste (90%). This collective perception is consistent with the definition of pollution stipulated in Government Regulation No. 22/2021 (PP No.22, 2021), wherein the introduction of pollutants alters the natural functions of aquatic systems. However, this heightened awareness corresponds with a significant loss of amenity value. The dominance of domestic waste has resulted in social displacement, with 86% of the community withdrawing from river-related activities (Q15). This condition signifies a functional shift of the river from a socially and economically valuable public space to an avoided ‘risk zone,’ reflecting a form of

environmental functional degradation that contradicts the mandate of Law No. 32/2009 concerning the provision of comfort and a healthy living environment (UU No.32, 2009).

The impacts of pollution extend beyond aesthetic degradation and have manifested as tangible public health risks. The data indicate a remarkably high prevalence of health disturbances, with 94% of respondents reporting previous physical complaints (Q16), including skin diseases and diarrhea, directly associated with river conditions (Q17, Q18). These findings exhibit a strong correlation with the upstream water quality profile of the Way Kuripan River, which has been documented to contain elevated organic loads (COD exceeding regulatory standards) and significant phosphate concentrations originating from greywater inputs. Chronic exposure to water that fails to meet health-based chemical quality standards (Class I, Government Regulation No. 22/2021) has been confirmed to increase community vulnerability to water-borne diseases, consistent with environmental epidemiology studies conducted in the Code and Winongo River systems (Fathrizky, 2022). The high proportion of community concern (74%) regarding family health underscores that pollution in the Way Kuripan River has escalated from an ecological degradation issue to a public health hazard requiring urgent sanitation interventions.

3.4. Correlation Analysis: Behavioral and Impact Perceptions

To examine the hypothesis regarding the relationship between domestic wastewater disposal behavior and community perceptions of social–environmental impacts, a Spearman rank correlation analysis was conducted. Statistical calculations involving 98 respondents yielded a very weak correlation coefficient ($p = 0.120$) with a significance value of $p = 0.238$. Since $p > 0.05$, it can be concluded that there is no statistically significant correlation between waste-disposal behavior and perceived levels of impact. This result indicates that the intensity of community perceptions of environmental degradation (Odor, waste accumulation, disease) does not exhibit a linear relationship with their waste management practices. In other words, individuals who discharge waste into the river do not necessarily have low impact perceptions, and vice versa. This phenomenon can be explained through the framework of the Theory of Planned Behavior (TPB), in which *Perceived Behavioral Control*, represented here by the availability of sanitation infrastructure, functions as a structural barrier that disconnects attitudes/perceptions from actual behavior.

The absence of a significant relationship suggests that the degradation of the Way Kuripan River is not driven by low environmental impact literacy (environmental awareness) but rather by external constraints. Although residents possess a high perception of pollution risks (recognizing social and environmental impacts), they are ‘compelled’ to continue disposing of wastewater into the river due to inadequate sanitation facilities and weak institutional interventions. Therefore, environmentally destructive behavior in this area reflects an adaptive response to infrastructural limitations (situational constraints) rather than a manifestation of individual indifference.

4. Conclusions

This study demonstrates that pollution in the Way Kuripan River is primarily driven by the discharge of non-toilet domestic wastewater, which elevates organic and nutrient loads and results in DO, BOD, COD, and phosphate levels exceeding the Class I water quality standards established under Government Regulation No. 22/2021. Although the physical condition of the water body appears relatively stable, the elevated chemical pressures indicate the occurrence of severe ecological degradation. Socially, the

community exhibits a strong perception of pollution and its associated impacts, including odor, solid waste accumulation, and increased health disturbances. However, no significant correlation was found between wastewater disposal behavior and perceived impacts, indicating that limitations in sanitation infrastructure serve as the principal factor sustaining pollution-related behaviors.

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