

## Social-Ecological Perspectives on Waste Management Behavior: A Case Study in Cisuren Village, Indonesia

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### ABSTRACT

Waste management remains a serious environmental challenge in rural areas of Indonesia, particularly in regions characterized by limited infrastructure, difficult geographical conditions, and deeply rooted socio-cultural practices. These conditions shape community perceptions and waste disposal behaviors, potentially generating long-term environmental and public health risks. This study aims to analyze community perceptions and waste management behaviors in Cisuren Village, Lebak Regency, and to identify the socio-ecological factors that influence these practices. The study employs a qualitative descriptive case study design. Data were collected through field observations, in-depth interviews with 10 informants including village officials, community leaders, youth representatives, and local stakeholders therefore document analysis conducted over a six-week period. Data analysis followed an interactive model guided by Social Ecological Theory and Cognitive-Behavioral Theory. The findings indicate that community perceptions are dominated by short-term pragmatic orientations, shaped by limited waste management facilities, hilly geographical conditions with ravines, household economic constraints, and weak institutional support. Practices such as dumping waste into ravines and open burning have become intergenerational habits, while fee-based collection schemes were rejected due to cost considerations. Cisuren Village represents a critical transitional phase in rural waste management. Sustainable change requires an integrated approach that combines the provision of basic infrastructure, environmental education, strengthening of village-level regulations, and multi-level collaboration between communities and government institutions.

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## INTRODUCTION

Waste is one of the environmental issues that remains a global, national, and local issue to this day. A World Bank report estimates that global waste will reach 2.2 billion tons per year by 2025, up from 1.3 billion tons in 2012 (Hoornweg & Tata, 2012; Ross & Rogoff, 2012). According to the World Bank's *What a Waste 2.0* report, the world currently generates over 2.01 billion tonnes of municipal solid waste annually, and this volume is projected to grow to approximately 3.40 billion tonnes by 2050 under a business-as-usual scenario (United Nations Environment Programme (UNEP), 2024; Ashraf et al., 2024). Meanwhile According to the United Nations Environment Programme (UNEP) and the International Solid Waste Association (ISWA), global municipal solid waste is predicted to increase from approximately 2.1–2.3 billion tonnes in 2023 to about 3.8 billion tonnes per year by 2050 if urgent action is not taken (United Nations Environment Programme (UNEP), 2024). In Southeast Asia, solid waste has become an increasingly serious environmental concern due to rapid urbanization, population growth, and economic development. The ASEAN region generated about 150 million tons of municipal solid waste in 2016 (Khanal & Anistia, 2023). At the same time, assessments of ASEAN waste suggest a high per capita municipal solid waste generation of around 1.14 kg per person per day, indicating continued pressure on waste management systems across member countries (Jain et al., 2017; Min & Cho, 2024). Moreover, typical waste compositions in Southeast Asian countries are dominated by organic, plastic, and other waste materials, reflecting challenges in segregation and environmentally sound disposal (Tun et al., 2020). In Indonesia, the Ministry of Environment and Forestry recorded data from the National Waste Management Information System (SIPSN) in 2024, showing that Indonesia is the fifth largest waste producer in the world, generating around 33.79 million tons of waste. Household waste is the main source, accounting for 50.8% of the total national waste composition (SIPSN, 2024). Chaerul et al. (2007) analyzed the problems of waste management in Indonesia due to the lack of a clear legal basis, inadequate waste disposal sites, lack of efforts for composting, and lack of proper landfill management systems. Long-term projections indicate that without policy changes and improved management, the volume of national waste will continue to rise; for example, it is estimated to reach 63 million tons by 2025, with the proportion of managed waste tending to decline if the system is not significantly strengthened (Yonatan, 2025).

In accordance with Law Number 18 of 2008 concerning Waste Management, waste management must be carried out systematically, comprehensively, and sustainably to improve public health, preserve the environment, and provide economic added value (Undang-Undang Nomor 18 Tahun 2008). However, empirical findings at the local level show that even though the legal framework is in place, the output in the field is still not optimal, et al. and there is still a need for facilities and public education (Putri et al., 2025), as well as being limited by institutional capacity and low public participation (Kartini & Zulkarnaini, 2025). Based on research in Jandi Meriah Village, low public awareness is still reflected in waste disposal and burning practices that do not comply with regulations, which are influenced by limited waste management facilities, minimal socialization, and the lack of an integrated transportation system (C. N. Sari et al., 2023). This condition shows a gap between the legal framework and waste management practices at the rural level. In Banten itself, there are still challenges in waste management. According to Andra Soni, Governor of Banten, only 13 percent of the approximately 8,000 tons of daily waste in Banten Province is managed. Most of the waste is handled by an open disposal system, while the rest is scattered everywhere without management (ANTARA News, 2025).

This study was conducted in Cisuren Village, Bayah District, Banten Province, from July 14 to August 20, 2025. This village has an agriculture-based socio-economic condition with unstable income for its

residents, which affects the community's ability and willingness to pay for waste management services. This is related to the simple waste management practices, where residents burn or dispose of waste into ravines and rivers due to the lack of facilities, transportation services, and institutional support. Although there have been improvement initiatives such as Karang Taruna activities, environmental education, and waste bank plans, these efforts have not been optimal due to limited resources and community participation. Given these conditions, Cisuren Village is a relevant and representative location for studying the dynamics of waste issues in rural areas and opportunities for improvement.

The findings in Cisuren Village are in line with previous studies in rural areas of Indonesia, which show that waste management behavior is influenced by various individual and environmental factors. Indrayanti et al. (2023) studied household waste disposal behavior in Salur Lasengalu Village and found that knowledge and attitudes have a significant relationship with waste disposal behavior, confirming the importance of individual factors, as also explained in the study by Romadhani & Munggaran (2025). Meanwhile, Yulida et al. (2016) showed that in addition to knowledge and attitudes, the availability of facilities and policy implementation are also significantly related to waste disposal behavior in upstream river areas, as explained in the study by Rozni & Sulistyorini (2024).

In addition, previous studies have also examined the relationship between knowledge and public perception in waste management. For example, Kakhandaki & Marol (2025) show that public perception and acceptance significantly influence waste management behavior, similar to the explanation in the study by Mosnegutu et al. (2025), which emphasizes that the level of information also shapes public perception and attitudes toward waste management systems. This study shows that existing research still analyzes behavioral factors partially and has not examined waste management behavior as a multi-level socio-ecological system that explains the interactions between individuals, communities, and organizations. Therefore, this study adopts the Social Ecological Model approach to examine waste management behavior more comprehensively in Cisuren Village.

From a theoretical standpoint, human development in the ecological perspective is understood as a progressive process of reciprocal interaction between an individual and their environment, influenced by interconnections across multiple environmental settings and broader social contexts (Bronfenbrenner, 1979). Complementing this view, Cognitive-Behavioral Theory posits that behavior results from the dynamic interaction between thoughts, feelings, and actions (Bandura, 1986), emphasizing that individuals, behavior, and the environment continuously influence one another. Changes in environmental behavior are influenced by the strengthening of individual cognitive capacities such as self-efficacy and belief in positive outcomes, the effectiveness of which depends on social context support (Sawitri et al., 2015). Within Bronfenbrenner's ecological framework, this process shows that individual behavior at the microsystem level is shaped and reinforced by norms, education, and collective habits at the meso to macrosystem levels (Qomariah et al., 2025). Referring to this theoretical basis, this study uses Bronfenbrenner's ecological perspective to organize the environmental influences from the microsystem to the macrosystem, as well as Bandura's Social Cognitive Theory to explain how personal factors and environmental contexts interact in shaping waste management behavior. Within this framework, this study analyzes how unsupportive social ecosystems, such as limited facilities and environmental education, influence the mindset of communities that consider dumping waste into valleys as normal, while exploring how cognitive changes through education and social systems that provide positive reinforcement can encourage more environmentally responsible waste management behavior.

Building on this theoretical foundation, this study aims to describe the perceptions and behaviors of the Cisuren Village community regarding waste management while addressing the gap by analyzing these dynamics at the individual, interpersonal, organizational, and community levels, thereby providing

a more comprehensive understanding of behavior formation within a layered socio-ecological context. Using a qualitative approach with a descriptive case study design, the research examines the potential for change towards a more participatory and sustainable waste management system. It is expected to contribute to a deeper understanding of the relationship between perception, behavior, and socio-ecological context in Cisuren Village. Theoretically, the study strengthens research on environmental behavior formation through multi-level social analysis, and practically, its findings can inform the development of waste management strategies that are participatory, adaptive, and sustainable, tailored to local community conditions.

## **RESEARCH METHODS**

### **Research Design**

This study employs a qualitative descriptive case study design to analyze waste disposal practices within a specific social and environmental context. The case study approach is selected because it enables a comprehensive exploration of social dynamics, meanings, and behavioral patterns that develop within a bounded setting through in-depth inquiry (Yin, 2018).

### **Research Setting**

In this research, the approach is used to examine the interaction between highland geographical conditions, entrenched disposal practices, weak local governance, and the absence of immediate ecological feedback in shaping cognitive schemas that normalize improper waste disposal. The study is purposely conducted in Cisuren Village, Lebak Regency, Indonesia, characterized by settlements located near ravines and limited formal waste management systems.

### **Participants**

This study used purposive sampling, with participants selected because they had a direct connection to the issue of waste management in Cisuren Village. Participant criteria included their position in the village structure (village government, stakeholders, and youth organization), influential individuals, involvement or knowledge of waste issues, direct exposure to waste disposal practices, and role in household waste management.

There were 10 participants, consisting of the village head, village officials, influential figures, local stakeholders, youth representatives, and external actors who had a role in household waste management and direct exposure to waste disposal practices (Table 1). Recruitment was carried out through recommendations from the village head and community leaders, as well as informal approaches, and all participants were willing to participate without refusal. Data saturation was achieved when additional participants no longer provided new perspectives but rather repeated similar views regarding waste management practices

**TABLE 1.** Participant Category

No.	Participant Category	Number	Primary Role
1.	Village Head	1	Village policy-making
2.	Village Officials	1	Program implementation and administration
3.	Influential Figures	3	Social norm formation
4.	Local Stakeholders	3	Village activity support
5.	Youth Organization	1	Community participation and activities
6.	External Actor	1	Household waste management
	Total	10	

## Data Collection

**TABLE 2.** Data Collection

Timeline (2024)	Method	Data Source	Duration/Frequency	Data Output
Weeks 1–2 (14–27 July)	Observation	Public spaces, ravines, residents' homes	1 hour per session	Observation notes, photographs
	Documentation	Initial field activities	Throughout activities	Photographs, field notes
Weeks 3–4 (28 July–10 August)	In-depth interviews	Village head, village officials, community leaders, youth	30 minutes per informant (n = 10)	Interview transcripts and summaries
Week 5 (11–20 August)	Observation	Waste disposal sites	1 hour per session	Observation notes
	Documentation	Field activity records and discussions	Throughout the research period	Photographs, field notes, minutes

## Data Analysis

This study employed the interactive data analysis model proposed by (Miles dkk., 2020), which conceptualizes qualitative analysis as an iterative and concurrent process with data collection. The model was selected due to its suitability for capturing complex social–ecological dynamics through triangulation of interviews, observations, and document review. Data analysis began with data reduction, focusing on information related to household waste disposal practices, underlying behavioral rationales, Cisuren's hilly geographic conditions, and institutional capacity constraints. The reduced data were then organized and displayed in thematic narratives to examine the relationship between physical environment and social behavior. Subsequent analysis involved open, axial, and selective coding (Saldaña, 2016) to identify core themes, which were interpreted using Bronfenbrenner's Social Ecological Theory and Bandura's Social Cognitive Theory. All analyses were conducted manually using thematic matrices.

## Trustworthiness

The trustworthiness of this study was ensured through strategies addressing credibility and transferability. Credibility was established through data triangulation by comparing information from multiple sources, including village officials, local stakeholders, influential figures, and external actors. Methodological triangulation was conducted by cross-checking interview data with direct observations of waste disposal practices and supporting documentation such as field notes and photographs, while

temporal triangulation involved observations conducted at different times and days to identify consistent behavioral patterns. In addition, prolonged engagement was achieved through six weeks of continuous fieldwork during the KKN program (14th July– 20th August 2024), which enabled the researchers to build rapport with the community and gain deeper insights into everyday waste management practices. Member checking was conducted informally by discussing preliminary findings with key informants and village officials, and peer debriefing took place through regular discussions within the KKN team to critically review emerging interpretations. Transferability was supported through thick descriptions of the social, economic, and ecological context of Cisuren Village, allowing readers to assess the relevance of the findings to similar rural settings.

Dependability and confirmability were ensured through systematic documentation and reflexive practice. An audit trail was maintained through organized field notes, observation records, interview summaries, and photographs that documented methodological decisions throughout the research process. Confirmability was addressed through reflexivity, with researchers continuously reflecting on their role as KKN students and external actors in the village to minimize personal bias and ensure that interpretations were grounded in empirical data and participant perspectives.

### **Ethical Considerations**

This study was conducted in accordance with established ethical principles for social research. Prior to data collection, institutional permission was obtained from the Cisuren Village government. All participants were provided with informed consent before interviews and observations, and participation was entirely voluntary, with the option to withdraw at any stage without any pressure. Participants' autonomy and dignity were respected throughout the research process (Creswell, 2013). To ensure confidentiality, personal identifiers were anonymized in the manuscript, and participants were referred to using general descriptors. Data were securely stored on password-protected personal devices to prevent unauthorized access or misuse.

### **Limitations**

This study has several limitations that should be considered when interpreting the findings. First, as a qualitative descriptive case study, the results are context-specific and reflect the socio-ecological dynamics of waste management in Cisuren Village during the period of the KKN program. Therefore, the findings are not intended to be generalized to all rural settings but rather to provide in-depth insights into similar villages with comparable social, economic, and ecological characteristics. Second, data collection was conducted over a limited time frame of six weeks, which allowed for an intensive understanding of existing practices and perceptions but did not enable the observation of long-term behavioral changes or the sustainability of proposed interventions. Third, this study primarily relied on qualitative data derived from observations, interviews, and community interactions, without incorporating quantitative measurements such as waste volume or environmental impact indicators. Finally, the analysis focused mainly on actors at the village and community levels, while the roles of higher-level institutions, such as district or municipal waste management authorities, were beyond the scope of this research. Despite these limitations, the study provides meaningful insights into the socio-ecological factors that shape waste management practices in rural contexts and offers a valuable foundation for future research and community-based interventions.

## RESULTS

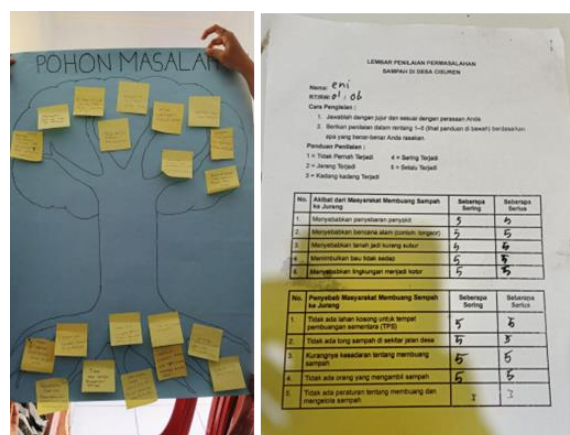
### Community Perceptions of Waste Management

The results of the study show that the perception of the Cisuren Village community towards waste management is dominated by a pragmatic and short-term orientation, where decisions on waste disposal are based more on convenience and affordability than on considerations of long-term environmental impacts. The practice of disposing of waste in ravines is understood to be a long-standing habit. Mr. Ade Sapta, Head of RW 2 Cisuren Village, stated, "...since long ago, people have been throwing waste into ravines because there was no place to dispose of it." This statement shows that the community tends to choose practical options as the basis for decision-making regarding waste disposal in Cisuren Village.

This pragmatic orientation became even more apparent when the community responded to the waste management plan proposed by an external actor, Mr. Dion, a resident outside Cisuren Village who works collecting waste in other areas, with a fee scheme of Rp15,000 per month per household and a collection frequency of every two days. Mr. Dion explained, "...Usually every other day. Every other day. For example, if I take it today, I won't take it tomorrow, but I'll take it the day after tomorrow."

During our assistance process in Cisuren Village, we offered the possibility of implementing the scheme in Cisuren Village, with us acting as brokers between Mr. Dion and the village office to facilitate our plan. Our plan received a positive response from Mr. Dion. However, Mr. Dion's wife reminded us to first ask the residents for their consent, stating, ".....just ask the residents first, I'm afraid people won't want to do that. Usually, some of it gets burned, they say. I don't know why it gets burned, I don't know where they throw it away."

After the meeting with Mr. Dion, we received instructions from Mr. Sugriyono, S.AP, the village secretary, to first consult with the residents of Cisuren Village regarding the plan through existing forums there, such as the BBM (Bangun Bersama Masyarakat) community gathering and several majelis ta'lim (religious gatherings). Although this scheme was deemed feasible by external parties, the plan was met with resistance from residents, particularly a group of women through the religious council forum there. One of the explicit statements that emerged was, "15 thousand can buy a lot of tea, a, it's a waste of money, we'd better throw the trash in the usual place (ravine/river)". This statement confirms that economic expenditure, although relatively small, is perceived as more significant than environmental risks that are not directly felt, given the relatively unstable income of farming families in Cisuren (ranging from Rp500,000 to Rp1,000,000).

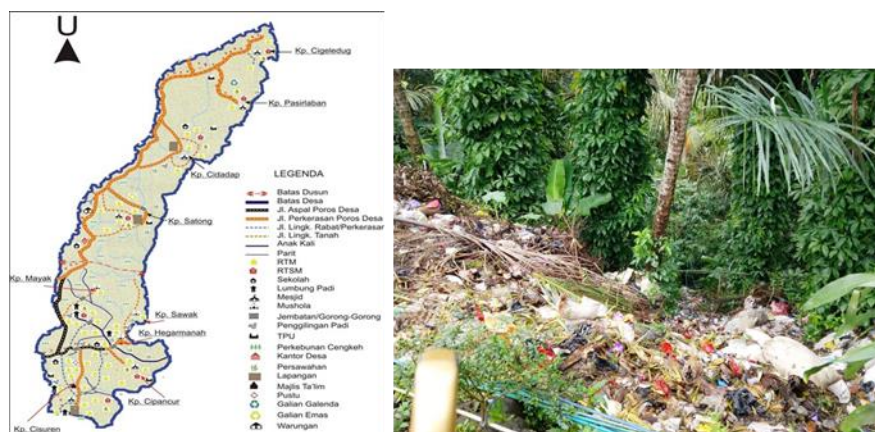


**FIGURES 1.** Problem Tree Analysis and Community Survey on Waste Management in Cisuren Village

Basically, the Cisuren Village community has basic knowledge about the health and environmental impacts of waste. This can be seen in the PRA (Participatory Rural Appraisal) that we conducted with the involvement of the community, the Village Head, Mr. Muhi Ruhiyat, S.E., the Village Secretary, Mr. Sugriyono, S.AP., and community representatives. The PRA results agreed that the cause of the waste problem in Cisuren Village is the lack of final disposal facilities in the village, resulting in the accumulation of waste around ravines and rivers. The community also realizes that the main consequence of this waste problem is that the environment becomes smelly and prone to disease. The results of the Waste Problem Assessment survey in Cisuren Village also reinforce these findings. This survey was conducted on 81 respondents, consisting of the Bangun Bersama Masyarakat Community Group (17 people), the RW 1 Taklim Council (35 people), and the RW 2 Taklim Council (29 people). The value for each indicator is the accumulation of frequency and severity scores, resulting in a total value in the range of hundreds. The survey results show that the cause of waste problems in Cisuren is a lack of awareness about waste disposal among the community and a lack of regulations on waste management in Cisuren Village. These results indicate that residents collectively assess this impact as frequent and very serious. However, this high level of awareness does not necessarily encourage behavioral change. In practice, a pragmatic orientation still dominates.

### Current Waste Disposal Behaviors

Based on direct observations at the research site, the community's waste disposal behavior is still dominated by two main methods, namely burning waste in their yards and dumping waste into ravines around their settlements. Household waste is generally collected before disposal, as explained by one resident, "When you dispose of waste, just collect it in this large plastic bag first, and when it is full, throw it into the ravine up there," said Mrs. Lilis, indicating an informal management pattern based on household habits. Waste disposal into ravines is generally carried out once a week in the morning, while waste burning is carried out almost every day in the afternoon, after household activities are completed.



**FIGURES 2.** Topographic Map of Cisuren Village and Informal Waste Disposal Site in a Ravine

The observations also showed that there was no difference in waste disposal behavior during certain seasons, because the community believed that the geographical conditions of the village, which was located on high ground, meant that waste disposed of in ravines would be carried by rainwater to the river, as expressed by another resident: "Even if waste is disposed of in ravines in this village, there will be no flooding because the village is located on high ground, so when it rains, the waste in the ravine will be washed away by the rain and flow into the river" said Mr. Toya. The spatial pattern and distribution of waste disposal locations are presented in Figure 1 to clarify the tendency of community waste disposal locations in the study area.



## Factors Influencing Disposal Behaviors

This situation explains why most villagers still dispose of their waste in pits or burn it, reflecting the structural challenges of waste management in the Cisuren village area and showing that households in the village tend to choose the cheapest and easiest waste management methods, even if they are not environmentally friendly. At the individual level, convenience is the dominant factor that shapes people's choices in disposing of waste. Residents generally have trash bins in their homes, but when these bins are full, there are no organized alternatives available. In these circumstances, rivers and ravines become the easiest and most “practical” option. In an interview with Mr. Harja, he stated that “...Actually, they know that throwing trash into the river is wrong, but where else can they throw the waste again? There is no waste collection site here.” This statement shows that the waste disposal behavior of the Cisuren Village community is not entirely due to a lack of environmental knowledge, but rather practical considerations. Waste is perceived as a problem that “exists but is not urgent” because it does not interfere with the main activities of residents as farmers and does not have any immediate consequences. Most residents understand that disposing of waste in rivers or ravines is not ideal. However, this knowledge is not followed by behavioral change because the negative impacts of waste are not directly felt in their lives. The normalization of dirty, smelly, and polluted environmental conditions has become a socially accepted part of daily life.

Economic factors are an important consideration in individual decision-making. Residents' unstable incomes cause strong resistance to a fee-based waste management system. The rejection of paid waste collection services offered by external actors (Mr. Dion) reflects the economic rationality of households in Cisuren Village. The cost of around IDR 15,000 per collection is perceived as a non-priority expense that is not commensurate with the perceived benefits, especially since there is a free alternative that is considered safe, namely dumping waste into rivers or ravines. As reflected in the responses obtained from interviews with residents during a women's religious gathering, “Why do we have to pay? It's okay to just throw it in the river...” This situation explains why most villagers still dispose of their waste in pits or burn it, reflecting the structural challenges of waste management in the Cisuren village area and showing that households in the village tend to choose the cheapest and easiest waste management methods, even if they are not environmentally friendly.

At the community level, the practice of littering has become a collectively accepted social norm because almost all residents engage in the same practice, so there is no social pressure to change. There are no reprimands, moral sanctions, or feelings of guilt associated with this behavior. On the contrary, the practice of dumping waste into rivers has been socially legitimized and passed down as a cross-generational habit. In an interview with Mr. Sobri, the head of the youth organization, he stated, “...it's always been like this, people throw their waste into the river. No one has ever reprimanded them...”.

The village of Cisuren actually has quite strong social capital, characterized by a culture of cooperation and the existence of social structures such as the youth organization and the PKK group, which are active in certain activities. However, the issue of waste management has never been a collective agenda driven by these groups. A member of the Family Welfare Empowerment (PKK) group said, “Waste is only discussed briefly, but there has never been clear guidance on what to do”. The lack of direction and facilitation has resulted in the community's potential not being connected to environmental issues. As a result, existing social cohesion has actually played a role in maintaining old habits. Peer influence works as a mechanism of conformity, not as social control.

At the institutional level, infrastructure and policy limitations are the main structural factors that hinder changes in community behavior. Cisuren Village does not have a temporary waste disposal site, a

waste transportation system, or village regulations (Perdes) governing waste management and penalties for violations. Mr.Ugi, a village official, openly stated that resource constraints are the main obstacle “...The village actually wants to implement a program, but there is no budget, and there is no assistance from the sub-district either...” This statement was reinforced by the Head of Cisuren Village, Mr. Muhi Ruhiyat, S.E., who said “If there are no facilities or funds, it is difficult to ask residents to change.” In addition to infrastructure limitations, the absence of village regulations related to waste management creates a governance vacuum and a lack of specific village regulations, sanctions, or incentives that can encourage behavioral change. The village government also stated that it lacks authority and budget due to the absence of support from the sub-district government and higher levels of government.

**TABLE 3.** Multi-level Factors Matrix of Waste Management in Cisuren Village

No	Level of Analysis	Key Factors	Field Findings Description	Data Sources
1.	Individual	Pragmatic Orientation (Convenience)	Residents tend to dispose of household waste into rivers or ravines because this option is perceived as the most convenient, cost-free, and least disruptive to daily activities.	Interviews with Mr. Harja and Observations
		Environmental Awareness limited to knowledge	Residents generally recognize that improper waste disposal is not an ideal practice and are aware of its environmental and health impacts (smell, dirt, potential disease).	Interviews with residents, PRA; respondent survey
		Household Economic Consideration	The waste management fee of around Rp15,000 is perceived as burdensome and not commensurate with the benefits felt.	Interviews with women’s religious groups
		Social Normalization of Waste Disposal	Disposal of waste into rivers has become a long-standing collective practice, and the widespread nature of this behavior limits the emergence of social pressure, moral sanctions, or community-level incentives for change.	Interview with Mr. Sobri
2.	Community	Untapped Social Capital	Although Cisuren Village has active community organizations such as youth groups (Karang Taruna) and women’s associations (PKK), these structures have not been mobilized for waste management issues.	Interviews with Mr. Harja and PKK members
		Conformity-oriented Interaction patterns	Social cohesion and inter-community relations actually reinforce the continuation of old habits. These interaction patterns function as mechanisms of conformity to long-standing waste disposal behaviors rather than as forms of social control that promote environmentally responsible practices.	Interviews with Residents and Observations
		Lack of Basic Infrastructure	Cisuren Village lacks temporary waste disposal sites, waste transportation systems, and supporting facilities.	Interview with Mr. Ugi
3.	Institutional	Absence of village regulations	There are no village regulations (Perdes), sanctions, or incentives related to waste management.	Interview with Village Chief Mr. Muhi Ruhiyat, S.E and village documents
		Limitations of Authority and Budget	The village government stated that it did not have sufficient fiscal capacity and authority due to a lack of support from the sub-district government and higher levels of government.	Interviews with Village Chief Mr. Muhi Ruhiyat, S.E and Mrn. Ugi

## Emerging Changes and Initiatives

In 2023, there was a plan to transport waste using a Tossa three-wheeled motorbike, initiated by one of the candidates for village head of Cisuren. However, the plan was not realized because the candidate was not elected as the village head. After the change in leadership, the elected village head did not continue with the waste management plan, as stated by Mr. Cece “When I ran for office, I had the idea of using Tossa motorcycles to transport trash, but it didn't happen because I didn't get enough votes”, then “until now, that idea has not been implemented...”

In addition, there used to be a waste management plan, but it has not been implemented, as stated by Mr. Ade Sabta, “...there used to be a plan to establish a waste bank, but it never got off the ground due to a lack of management personnel...”. As a result, until this study was conducted, Cisuren Village did not have a temporary disposal site or a waste management system run by the village government or community groups. This situation caused the community to continue their old habit of disposing of waste into ravines without any management process, which residents viewed as a normal practice that did not cause any immediate impact “There's no trash disposal site here, so we just throw it away in the nearest ravine. Yes, it smells, but at least my house doesn't flood”.

The absence of official policies and directives from the village government also has an impact on the dysfunctional role of youth organizations, such as Karang Taruna, in waste management issues, as stated by one of the Karang Taruna administrators, was “...it's just that the neighborhood association (RW) chairman has never been concerned about waste issues. Actually, if he was given instructions, he could do it”.

In this context, the initiative for change emerged through the role of researchers who were also Community Service Program (KKN) students by implementing environmental education programs, namely Green Class and Simple Composting. The Green Class program was aimed at elementary school students with material on introducing types of waste and sorting organic and inorganic waste. This program was implemented in three elementary schools, namely SDN 03 Cisuren, MI MA Cisuren, and SDN 01 Cisuren, and received positive responses from participants. This education is a form of effort to introduce environmental knowledge amid the absence of structured waste management programs at the village level.

Next, the Simple Composting program was implemented in two different locations with the aim of reaching all residents of Cisuren Village, namely at the RW 07 Post and the Village Hall. During the simple composting activity carried out at RW 07 Post, the community showed high enthusiasm and active involvement in discussions. In contrast, a similar activity carried out at the Village Hall showed a low level of participation, even accompanied by avoidance tendencies, such as closing the door when researchers conducted door-to-door invitations. In addition, the involvement of the PKK mothers' group also showed low participation.

**TABLE 4.** Timeline of Change Initiative

Time	Initiator	Form of Activity	Target	Participation	Notes
Week 1	Researchers & Religious Leaders	Initial socialization of the waste issue	Residents	Currently	Residents participate in activities
Week 2	Researchers	Participatory Rapid Appraisal (PRA) & village discussion	Village officials & community representatives	Currently	Agreement on issues
Week 3	Researchers	Green Class	Elementary school children	Height	Active and enthusiastic child
Week 4	Researchers	Making Simple Compost	Residents	Fragmented	Enthusiastic at RW 07 Post, low at Village Hall

## DISCUSSION

### Interpretation Through the Social-Ecological Framework

The issue of waste management in Cisuren Village cannot be understood solely as a matter of individual behavior, but rather as the result of interrelated socio-ecological conditions. The practice of disposing of waste into rivers and ravines occurs because such behavior is considered normal, inexpensive, and does not have any immediate consequences in the daily lives of the community. This perspective is in line with Bronfenbrenner's ecological systems theory, which views human behavior as a response to the social and structural environment in which individuals exist (Bronfenbrenner, 1979a). In the context of Cisuren, household decisions on waste management are shaped by permissive social norms, the absence of village regulations and facilities, and a low perception of environmental risk due to geographical conditions. Thus, waste disposal behavior is not an individual deviation, but a rational adaptation to the existing environmental system, as emphasized in the socio-ecological approach (McLeroy et al., 1988).

Cross-level ecological interactions show that waste disposal practices in Cisuren are maintained by mutually reinforcing relationships between micro, meso, and macro systems. At the microsystem level, households choose to dispose of waste in rivers or ravines because it is considered the most practical and cost-free option. This choice is not corrected at the mesosystem level, because village social organizations such as the PKK and Karang Taruna have not integrated the issue of waste into their collective agenda. The absence of regulations, facilities, and transportation services at the ecosystem level further reinforces the continuation of this practice, while at the macrosystem level, cultural norms and economic rationality shape the perception that waste disposal does not pose a significant risk. This pattern shows that environmental behavior does not stand alone, but is the result of interactions between social and institutional systems that shape the context of community action, as explained in the social-ecological systems framework that emphasizes the interrelationship between actors, institutions, and the environment (Ostrom, 2009).

Bronfenbrenner's framework helps explain why ecologically problematic waste management patterns remain stable in the long term. From a social ecological perspective, the behavior of the Cisuren community is not the result of indifference, but rather a form of adaptation to an environmental system that does not provide negative feedback or incentives for change. Student interventions through education and waste management practices only work at the micro level and are temporary, because they are not followed by changes in the ecosystem and macrosystem, such as village regulations, provision of facilities, or shifts in collective norms. Bronfenbrenner emphasizes that sustainable behavioral change requires changes in the broader environmental context, because the main effects arise from interactions between systems, not from individuals alone. Thus, this theory explains why individual awareness-based approaches are not effective enough and affirms the importance of social and institutional transformation as a prerequisite for sustainable environmental behavioral change (Stokols, 1996).

### Behavioral Change Processes

The habit of throwing garbage into ravines in Cisuren Village shows automatic behavior with minimal reflection, as reflected in the daily practices of residents who act without considering the environmental impact. From a cognitive perspective, repetitive behavior in the same environmental context tends to form habit formation, which is a pattern of automatic actions triggered by situational cues and difficult to change even though individuals are aware of the negative impacts (Wood & Neal, 2007; Verplanken & Aarts, 1999). Such habits develop when the environment consistently provides convenience and does not

present obstacles or direct consequences to such behavioral habits (Thomas dkk., 2016).

At the microsystem level, the habit of littering is reinforced by the immediate environment, such as family, neighbors, and daily activity spaces, which continuously reproduce similar behavior patterns. Bronfenbrenner (1979) asserts that the microsystem is the most influential context of direct interaction in the formation of individual behavior, especially when certain practices have become part of social routines. This behavior of littering is learned through a process of social learning, mainly through imitation of the behavior of parents and adults around the child. This is in line with social learning theory, which states that individuals, especially children, learn behavior through observation and imitation of significant figures in their environment (Bandura, 1977).

Although some people realize that dumping waste into ravines has the potential to damage the environment, this behavior persists due to cognitive dissonance mechanisms that are not strong enough to change habitual actions. Individuals who are aware of the environmental impact still tend to dispose of waste in ravines because the social environment does not provide feedback or sanctions that encourage reevaluation of this behavior (Festinger, 2001). In Cisuren Village, awareness that waste can pollute the environment and disrupt health coexists with the habit of dumping waste into ravines, but this tension is often mitigated by justifications that the waste is “invisible” or has “no direct impact” on daily life.

From a socio-ecological perspective, the behavior of dumping waste into ravines in Cisuren Village is influenced by interactions across social systems, from micro-systems to ecosystems. The main obstacle to change lies in the condition of the ecosystem, which does not provide structural support (lack of reinforcement) for alternative behaviors, such as the absence of temporary disposal sites, waste transportation systems, and village policies that formally regulate waste management. Previous research shows that without a clear formal structure, environmental behavior change is difficult to sustain because individuals lose the contextual framework that encourages new behaviors (Steg & Groot, 2018).

However, field results also show a pattern of selective participation, where community participation in change initiatives is uneven and highly influenced by the local social context. Some groups show openness and enthusiasm, while others tend to be passive or avoidant, reflecting that behavioral change is influenced not only by individual awareness but also by social dynamics within the microsystem (Yang et al., 2022). Thus, waste management behavior in Cisuren Village cannot be understood solely as an individual choice, but rather as the result of complex interactions between cognitive factors and social structures at the microsystem level.

## Comparison with Literature

Findings in Cisuren Village show a pattern that is consistent with various studies on waste management in other rural areas in Indonesia. Research in Watualang Village, Ngawi District, shows that poor waste management is not solely due to community behavior, but is closely related to the lack of basic facilities such as temporary storage sites (TPS), so that residents choose to burn waste or dispose of it indiscriminately as the most practical solution (Rahmawati & Baskara, 2022). A similar pattern was also found in a study in Banuhampu Subdistrict, Agam Regency, where most household waste is still dumped into ravines or open areas due to the lack of planning, institutions, and adequate waste management facilities at the subdistrict and village levels (P. N. Sari, 2016). These similarities indicate that the practice of indiscriminate waste disposal in Cisuren is part of a structural problem that is common in rural contexts, which leads communities to rely on pragmatic practices that are considered the easiest and cheapest.

The main difference between waste management patterns in urban areas and Cisuren Village lies in the existence of waste management systems and institutions. A study of urban waste management in the city of Yogyakarta shows that household waste is “transported by garbage carts to be disposed of at the

Yogyakarta City Government's temporary storage site, which is then transported to the Piyungan landfill," so that waste management is positioned as a public affair that is handled in an organized manner by formal institutions and external partners such as the Environmental Agency and NGOs (Arsanti & Giyarsih, 2012). This condition is very different from Cisuren Village, where the results of the PRA and survey show that there are no TPS, TPA, or waste transportation services, so that the community is completely dependent on informal practices such as dumping waste into ravines or rivers.

Another difference that highlights the uniqueness of the Cisuren Village case compared to other literature findings is the socio-ecological differences of the community there. Studies in Plumbon Village and other hilly topographical areas show that although the community still disposes of waste into rivers or burns it, they have a positive perception of waste and are beginning to recognize the importance of 3R-based management and the role of formal actors such as waste banks and guidance from local government (Asmara & Kurniawan, 2015). The Cisuren community has normalized the disposal of waste into rivers and ravines because the ecological impact is considered not to return to the village area. In addition, unlike the empowerment practices in Pangi Village, which placed PKK and Karang Taruna women as the main actors in the processing of organic and inorganic waste to generate economic value and significantly increase community understanding (Kunusa & Ibayu, 2020), social capital in Cisuren has not been linked to waste issues and is more focused on agricultural infrastructure activities. Another unique aspect of Cisuren is the social rejection of individual-based alternative solutions, such as paid waste collection services, which are not widely discussed in other studies that tend to emphasize limitations in facilities and institutions (Rahman, 2013). These findings indicate that the waste problem in Cisuren is not merely a matter of absent facilities, but rather the result of a socio-ecological system that allows unsustainable practices to persist without sufficient social or ecological pressure.

This study contributes to the literature on rural waste management by expanding the focus of research from participatory and educational approaches to a more systemic understanding based on socio-ecological dynamics. Another study shows an example at Margamekar Village shows that the application of Participatory Rural Appraisal (PRA) techniques and socialization programs can increase community awareness and participation in waste management, especially when supported by formal institutions and government programs such as Kampung SABER, LCO, and TPS 3R (Suhendra et al., 2024; Suhendra, Lestari, et al., 2024). However, the findings in Cisuren Village complement this study by showing that in the context of villages that lack institutional support, regulations, and waste management infrastructure, educational and participatory interventions alone are not sufficient to encourage sustainable behavioral change. The Cisuren case confirms that waste disposal practices are the result of interactions between the ecological conditions of the highlands, the social normalization of waste disposal, household economic rationality, and weak village governance, thereby enriching the literature with the perspective that the success of rural waste management is largely determined by the suitability of interventions to local socio-ecological characteristics and the sustainability of structural support from the village government.

### **Practical Implications**

The findings of this study highlight the importance of a community-based approach that utilizes local social capital. Existing community organizations such as youth groups (Karang Taruna) and women's associations (Family Welfare Empowerment/PKK) can serve as entry points for waste management initiatives, provided that they are supported by clear program direction and institutional backing. This finding is consistent with previous studies showing that the success of rural waste management largely depends on the mobilization of local organizations (Guerrero et.al., 2013). From a policy perspective, the results indicate the need to integrate waste management into village development planning. Village governments require cross-level policy support, particularly from sub-district and district authorities, to

ensure that waste management is not treated solely as a local responsibility. Waste management in Desa Cisuren therefore requires multi-stakeholder collaboration, including the involvement of academics and community facilitators in providing contextual and sustained environmental education.

### **Study Limitations**

This study has several limitations that should be considered when interpreting the findings. First, methodologically, this study adopts a qualitative approach with a limited number of informants. As such, it does not aim to produce statistically generalizable findings, but rather to provide an in-depth contextual understanding (Creswell, 2009). Second, the findings are strongly shaped by the geographical and social characteristics of Desa Cisuren, which is located in a hilly area with limited infrastructure. Therefore, the results cannot be directly generalized to villages with different physical and institutional contexts (Marshall & Farahbakhsh, 2013). Third, this study employs a cross-sectional design, which limits its ability to capture long-term changes in environmental behavior. Existing literature suggests that such behavioral change is gradual and influenced by ongoing social dynamics and institutional interactions (Kollmuss & Agyeman, 2002). In addition, in-depth exploration of specific groups, such as women's organizations and youth, remains limited, despite evidence that these groups play an important role in community-based environmental management.

### **Directions for Future Research**

Longitudinal studies are particularly needed to assess the sustainability of behavioral change and the long-term impacts of institutional interventions (Bamberg & Möser, 2007). This study contributes to explaining why environmental knowledge does not automatically lead to behavioral change by highlighting the influence of geographical constraints and limited infrastructure in Desa Cisuren. By relying on the lived experiences and perspectives of residents and village officials, the findings offer a realistic portrayal of local conditions. Furthermore, the study demonstrates that although social cohesion and collective values remain strong, without clear institutional direction and support, such social capital alone is insufficient to drive collective change in waste management practices.

### **CONCLUSION**

This study concludes that public perceptions of waste management in Cisuren Village are largely shaped by short-term pragmatic considerations, where convenience and economic affordability are prioritized over awareness of long-term environmental risks. Regarding influencing factors, the findings show that waste disposal behavior is not only driven by individual attitudes, but arises from the interaction of socio-ecological conditions, including the hilly ecological conditions of the village, the social normalization of dumping waste into ravines, limited household income, and the absence of formal waste management infrastructure, regulations, and institutions. Although community members have basic knowledge about the health and environmental impacts of waste, this awareness does not translate into behavioral change due to weak structural support and a lack of viable collective alternatives. From a theoretical perspective, this study contributes to the socio-ecological and behavioral literature by describing how environmentally unsustainable practices persist when ecological conditions and governance systems fail to create feedback mechanisms that encourage pro-environmental behavior, making effective rural waste management require not only participatory and educational approaches, but also integrated interventions that align behavioral change efforts with local socio-ecological realities and institutional capacities.

The findings of this study confirm that changes in waste management in Cisuren Village need to be directed towards adjusting the social context, rather than merely changing individual behavior. Quick wins can be achieved at the micro and meso levels by utilizing existing social structures, such as establishing informal RT/RW rules on waste disposal and involving PKK and Karang Taruna in low-cost thematic community service activities related to waste. At the household level, simple practice-based interventions such as basic sorting and organic waste processing are more in line with the economic rationality of the community than paid service schemes. For long-term change, interventions need to target the ecosystem level through the formulation of village regulations, the provision of basic facilities, and service support from the sub-district government. The role of students and external actors should be focused on triggering initial change and connecting actors, rather than as the main implementers. This tiered approach is consistent with the socio-ecological framework, which emphasizes that sustainable behavioral change occurs when the social and institutional environment also changes.

Despite these limitations, this study provides a strong foundation for future research. The multi-level analytical framework applied in this study enables further investigation into mechanisms for strengthening village-level organizations in waste management initiatives. The findings of this study indicate that waste management issues are not only local in nature but also reflect socio-ecological patterns that are commonly found in other rural areas in Indonesia. Therefore, behavioral change cannot rely solely on individual awareness but requires an integrated approach that strengthens the cognitive aspects of the community while providing consistent social and structural support. Although barriers to change remain dominant, selective participation and positive responses on a limited scale confirm that the potential for behavioral transformation remains open when the socio-ecological context begins to shift.

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