

## PROCEEDING

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“Navigating Global Transformation in an Uncertain World: Interdisciplinary  
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### PERSPECTIVES ON WASTE MANAGEMENT FOR IMPROVING WASTE MANAGEMENT WITH IMPACT ON ENVIRONMENTAL SUSTAINABILITY

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#### ABSTRACT

The waste problem in Indonesia has reached an alarming level, with national annual production exceeding 68 million tons, nearly 40% of which remains unmanaged (KLHK, 2025). This study aims to analyze the environmental and public health impacts of unmanaged waste, evaluate the effectiveness of current government regulations, and increase public awareness regarding individual responsibility in waste reduction and management (Jambeck et al., 2015; Purwaningrum, 2016). Using a descriptive-analytical qualitative method (Bowen, 2009) to examine real environmental phenomena, official statistics from the Ministry of Environment and Forestry (KLHK), and related legal frameworks—including Law No. 18 of 2008 and Government Regulation No. 81 of 2012—the findings reveal that household activities account for the largest proportion of waste (56%), dominated by single-use plastics. Furthermore, despite comprehensive legal regulations, law enforcement and public participation remain weak. This study concludes that sustainable waste management requires a collective behavioral transformation starting at the individual level alongside enhanced institutional synergy (Damanhuri & Padmi, 2010).

Keywords: Awareness, Environment, Policy, Recycling, Waste

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#### INTRODUCTION

The environmental crisis caused by improper waste management poses a growing threat to ecosystem sustainability and human health (Jambeck et al., 2015). In many urban and rural areas across Indonesia, rivers previously used for daily activities are now polluted by food waste, industrial waste, and single-use plastics (Purwaningrum, 2016). According to data from the Ministry of Environment and Forestry (KLHK, 2025), national waste production exceeds 68 million tons per year, with approximately 40% uncollected or untreated in landfills. This continuous accumulation highlights a critical gap between environmental regulations and community practices.

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Previous research emphasizes that structural policy interventions must be complemented by behavioral change to achieve sustainable environmental governance (Damanhuri & Padmi, 2010). Although legal provisions establish obligations for waste reduction and management, low public awareness remains a primary obstacle (Dhokhikah et al., 2015). This study aims to evaluate the environmental and health consequences of unmanaged waste, assess the effectiveness of Indonesia's existing regulatory framework, and examine the role of individual- and community-driven initiatives in reducing waste generation. Insights from this article offer legal and social reflections on bridging policy implementation and public compliance.

## METHODS

This study adopts a qualitative descriptive-analytical approach to analyze waste management issues and regulatory enforcement in Indonesia (Bowen, 2009). The methodology relies on secondary data analysis and document review, drawing from official reports of the Ministry of Environment and Forestry (KLHK, 2025), statutory provisions, and related academic literature.

The regulatory analysis focuses on Law No. 18 of 2008 on Waste Management, Law No. 32 of 2009 on Environmental Protection and Management, and Government Regulation No. 81 of 2012 (Government of Indonesia, 2008, 2009, 2012). Additionally, empirical case studies on landfill fires and community-led river cleanup movements were examined to assess practical challenges in waste handling and the operational efficiency of local environmental initiatives (Anatan & Nur, 2023).

## RESULTS AND DISCUSSION

Findings indicate that unmanaged waste accumulation directly degrades environmental quality and poses severe public health risks (Purwaningrum, 2016). Household activities constitute the primary source of waste generation, accounting for 56% of total volume (KLHK, 2025). On average, an individual produces 0.85 kg of waste per day, with single-use plastics contributing 17% to that daily total. Nationally, plastic waste reaches 12.4 million tons annually, yet only 11% is successfully recycled (Tempo.co, 2026).

Plastic waste transported into marine environments severely damages aquatic ecosystems, causing marine organisms to ingest synthetic materials and introducing microplastics into the human food chain (Jambeck et al., 2015). Furthermore, open burning and uncontrolled landfill accumulation trigger severe atmospheric pollution. For example, landfill fires in Jatiwaringin (Tangerang), Benowo (Surabaya), and Pakusari (Jember) in July 2026 significantly degraded local air quality and exposed surrounding populations to toxic emissions.

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| Waste Management Indicator                | Metric Value      |
|-------------------------------------------|-------------------|
| Total Annual Waste                        | > 68 million tons |
| Share of Unmanaged Waste                  | ~ 40%             |
| Household Contribution to Total Waste     | 56%               |
| Daily Waste Generation per Person         | 0.85 kg / day     |
| Single-Use Plastic Portion in Daily Waste | 17%               |
| National Annual Plastic Waste             | 12.4 Million Tons |
| Plastic Waste Recycling Rate              | 11%               |

Indonesia has enacted several legal instruments to govern waste management, including Law No. 18 of 2008 on Waste Management, Law No. 32 of 2009 on Environmental Protection and Management, Government Regulation No. 81 of 2012, Government Regulation No. 27 of 2020 on specific waste management and waste banks, and Presidential Regulation No. 97 of 2017 (JAKSTRANAS) (Government of Indonesia, 2008, 2009, 2012, 2017, 2020). Despite this comprehensive regulatory framework, implementation remains sub-optimal due to limited law enforcement and widespread public apathy (Dhokhikah et al., 2015). Many communities continue to view waste management solely as a government responsibility, resulting in widespread littering and improper disposal during social and recreational activities.

Addressing this challenge requires a dual approach: strict regulatory compliance enforced by local authorities, and grassroots participation through individual actions such as using reusable containers, sorting organic and inorganic waste at home, and supporting waste-to-energy or composting initiatives (Damanhuri & Padmi, 2010; Wijayanti & Suryani, 2015). Community movements, such as voluntary river cleanups, increasingly demonstrate the impact of collective civic action in complementing formal environmental management.

## CONCLUSION

Unmanaged waste poses severe environmental, health, and legal challenges in Indonesia, driven primarily by household consumption and low recycling rates. Despite comprehensive legal regulations—including Law No. 18 of 2008 and Government Regulation No. 81 of 2012—their effectiveness is constrained by weak compliance

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mechanisms and public enforcement. Achieving sustainable waste management requires bridging legal mandates and public behavior through individual waste reduction, systemic waste segregation, and active synergy between government institutions and local communities.

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