



COLLABORATIVE GOVERNANCE IN INDONESIAN WASTE MANAGEMENT: A SYSTEMATIC LITERATURE REVIEW

PEMERINTAHAN KOLABORATIF DALAM PENGELOLAAN SAMPAH DI INDONESIA: TINJAUAN LITERATUR SISTEMATIS

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ABSTRACT

This systematic literature review examines the implementation and dynamics of collaborative governance in waste management across Indonesia. Study uses a literature review method to identify, analyze, and synthesize scientific findings related to the application of collaborative governance in waste management in Indonesia. Focusing on collaborative governance models, regional case studies, barriers, and enabling factors in Indonesia waste management. The findings reveal that while collaborative governance engaging government, private sector, and community stakeholders has been widely adopted in policy and practice, its effectiveness is often constrained by asymmetrical power relations, fragmented institutional arrangements, limited community participation, and insufficient private sector involvement. Case studies from cities such as Malang, Bali, Bandung, Gresik, and others highlight both successful initiatives like waste banks and public-private partnership, and persistent challenges including weak law enforcement, lack of shared goals, and resource limitation. The review underscores the need for a shift from symbolic participation to genuine co-creation, recommending institutional reforms such as multi-stakeholder forums, formal recognition of informal actors, facilitative leadership, and digital infrastructure for monitoring and feedback. Ultimately, strengthening collaborative governance is essential for achieving sustainable waste management and advancing Indonesia's environmental and development goals.

ABSTRAK

Ulasan sistematis literatur ini mengkaji implementasi dan dinamika tata kelola kolaboratif dalam pengelolaan sampah di seluruh Indonesia. Studi ini menggunakan metode ulasan literatur untuk mengidentifikasi, menganalisis, dan mensintesis temuan ilmiah terkait penerapan tata kelola kolaboratif dalam pengelolaan sampah di Indonesia. Fokus penelitian mencakup model tata kelola kolaboratif, studi kasus regional, hambatan, dan faktor pendorong dalam pengelolaan sampah di Indonesia. Temuan menunjukkan bahwa meskipun tata kelola kolaboratif yang melibatkan pemerintah, sektor swasta, dan pemangku kepentingan masyarakat telah luas diterapkan dalam kebijakan dan praktik, efektivitasnya sering kali dibatasi oleh hubungan kekuasaan yang tidak

seimbang, pengaturan institusional yang terfragmentasi, partisipasi masyarakat yang terbatas, dan keterlibatan sektor swasta yang tidak memadai. Studi kasus dari kota-kota seperti Malang, Bali, Bandung, Gresik, dan lainnya menyoroti inisiatif sukses seperti bank sampah dan kemitraan publik-swasta, serta tantangan yang persisten termasuk penegakan hukum yang lemah, kurangnya tujuan bersama, dan keterbatasan sumber daya. Tinjauan ini menekankan perlunya pergeseran dari partisipasi simbolis ke kolaborasi yang sejati, dengan merekomendasikan reformasi institusional seperti forum multi-pemangku kepentingan, pengakuan formal terhadap aktor informal, kepemimpinan yang memfasilitasi, dan infrastruktur digital untuk pemantauan dan umpan balik. Pada akhirnya, penguatan tata kelola kolaboratif sangat penting untuk mencapai pengelolaan sampah yang berkelanjutan dan guna mendorong tujuan lingkungan dan pembangunan Indonesia.

INTRODUCTION

Waste management issues in Indonesia have reached an alarming level. Data from the Ministry of Environment and Forestry (KLHK) shows that national waste generation in 2024 reached 25,66 million tons per year, with organic waste (50%), and plastic (19%) dominating (KLHK, 2024). The largest contributor is Java Island with 13.46 million tons (52.48% of national waste generation), followed by Sumatra Island with 5.09 million tons (19.84%) and Kalimantan Island with 2.82 million tons (11.02%). The limited capacity of Final Waste Processing Facilities (TPA), particularly those still dominated by open dumping systems, exacerbates environmental issues such as water, soil, and air pollution, as well as greenhouse gas emissions. Waste management challenges are not only technical but also institutional and social in nature. Weak coordination between the central government, local governments, the private sector, and the community often results in waste management policies not being implemented effectively.

Collaborative Governance has emerged as a critical strategy for addressing Indonesia's complex waste management challenges, which are characterized by rapid urbanization, diverse stakeholders, and persistent environmental issues. Recent research highlight the need for multi-stakeholder engagement, integration of advanced technologies, and community empowerment to achieve sustainable waste management outcomes (Mangindaan et al., 2022). Systematic literature reviews and case studies reveal that while Indonesia has made progress in policy development and stakeholder collaboration, significant barriers remain, including fragmented institutional arrangements, limited community participation, and insufficient private sector involvement (Feberina et al., 2021). The adoption of Industry 4.0 technologies and circular economy principles is seen as a promising avenue for enhancing collaboration and achieving Sustainable Development Goals (SDGs) (Fatimah et al., 2020). However, the literature also points to gaps in implementation, especially in integrating local knowledge, ensuring policy enforcement, and scaling successful models across regions.

Recent research also highlights that while Indonesia has made formal commitments to community-based and integrated waste management such as through local regulations and city level programs the practical implementation of collaborative governance often faces significant barriers. These include asymmetrical power relation that limit community involvement, fragmented institutional arrangements, strong bureaucratic control and weak participatory processes. Such challenges can result in a gap between policy intentions and on the ground realities, hindering the achievement of sustainable development and circular economy goals. Despite these obstacles, there are promising examples where collaborative governance has led to more effective waste management. The selected literature includes systematic reviews, case studies,

and conceptual frameworks, offering a comprehensive understanding of the opportunities, challenges, and future directions for collaborative governance in Indonesia waste management. This review also synthesizes findings from systematic and scoping reviews, case studies, and conceptual frameworks to provide a comprehensive understanding of collaborative governance in Indonesian waste management.

METHODS

This study uses a literature review method to identify, analyze, and synthesize scientific findings related to the application of collaborative governance in waste management in Indonesia. Focusing on collaborative governance models, regional case studies, barriers, and enabling factors in Indonesia waste management. A systematic search was conducted across over various research papers, encompassing database such as Semantic Scholar, PubMed. The search strategy included targeted queries on collaborative governance, waste management, community empowerment, and related frameworks in Indonesia. In total, 995 papers were identified, 149 were screened, 53 were deemed eligible, and 15 were included in this review.

Search Strategy:

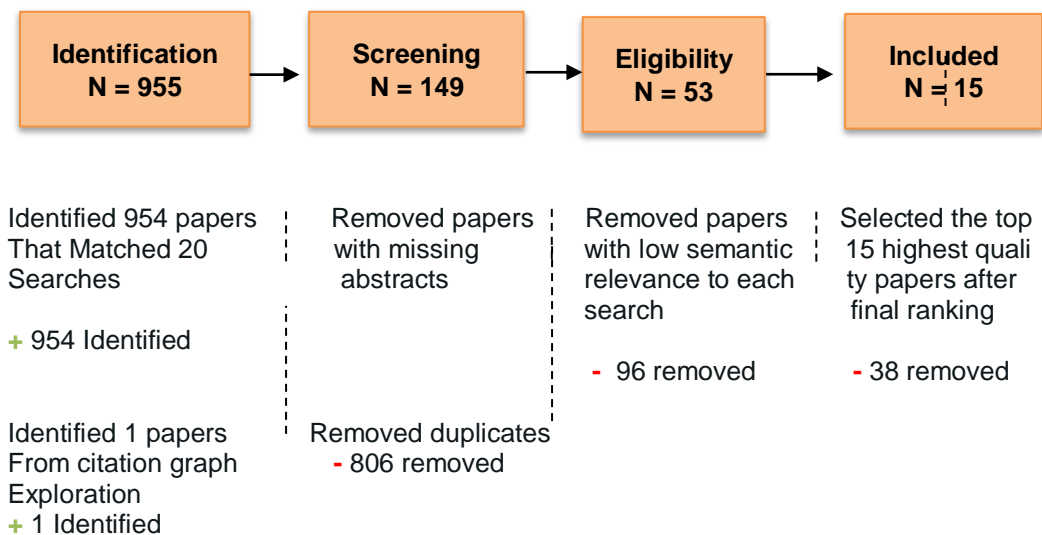


Figure 1. Prisma flow diagram results

Source: *Research results, 2025*

Eight unique search groups were used, focusing on collaborative governance models, regional case studies, barriers, and enabling factors in Indonesia waste management.

RESULTS AND DISCUSSION

In Collaborative Governance Models and Frameworks, research identifies several collaborative governance models applied in Indonesia, often drawing of frameworks such as Ansell and Gash, which emphasize consensus-oriented decision making among government, private sector, and community stakeholders. The integration of circular economy principles and Industry 4.0 technologies (e.g., IoT) is increasingly advocated to facilitate stakeholder coordination and data driven decision making. In aspect stakeholder engagement and Community Empowerment, Community

empowerment is recognized as a key factor in successful waste management, particularly in river basins and urban areas. Effective intervention include participatory engagement, education, and the establishment of waste banks, which foster local ownership and behavioral change (Feberina et al., 2021). However, engagement levels vary, and interventions are often hindered by limited resources and weak institutional support. Major barriers include fragmented institutional arrangements, lack of clear roles among stakeholders, insufficient private sector participation, and limited enforcement of policies (Lodan et al., 2022). Power asymmetries and bureaucratic dominance can undermine genuine collaboration, while resource constraints and low public awareness further impede progress (Hernandez et al., 2023). The adoption of smart waste management systems leveraging IoT and digital platforms is seen as a promising innovation for improving coordination and monitoring. Policy reforms and the integration of good governance principles (transparency, participation, accountability) are also recommended to enhance collaborative efforts. The table below present 15 selected papers that serve as references in analyzing the application of collaborative governance in Indonesian waste management.

Table 1. Summary 15 selected papers on collaborative governance in Indonesian waste management

No	Author	Paper Tittle	Results/Findings
1	Ari Gunawan	Collaborative Governance in Urban Waste Management: Policy Evaluation of Malang City in the Post-Pandemic SDGs Era	Collaboration is limited by power imbalances, fragmented institutions, and weak participation; recommends co-creation and digital feedback
2	K. Ain, M. Nasri, M. N. Alamsyah, M. R. Pratama, T. Kurniawan	Collaborative governance in managing plastic waste in Bali	Collaborative governance exist but lacks community participation and shared goals; law enforcement and awareness are weak.
3	Kurhayadi	Collaborative Governance in Waste Management in Bandung City	Collaboration is semi formal; KangPisman program promotes waste reduction as a lifestyle, but relies on partner commitment
4	Jati Puspita Rini, Ely Sufianti, Sait Abdullah	Collaborative Governance Model Integrated Waste Management in Bandung City	Stakeholder roles are unclear; recommends a three-stage collaborative model for integrated management
5	Diana Hertiaty, Lukman Arif	Collaborative Governance in the Management of a Waste Bank	Structured collaboration among government, private sector, and community; private sector role limited, shared vision needed.
6	Adelia Dwinta Amelinda, Arimurti Kriswibowo	Collaborative Governance in Waste Management (Study In The Integrated Waste	Collaboration at TPST Tambakrejo is running well but faces some obstacles; overall, governance is optimal.

		Management Site Of Tambakrejo Area, Sidoarjo Regency)	
7	Heru Rochmansjah	Good Governance Principles in Waste Management in the Greater Bandung Region, West Java Province, Indonesia	Good governance principles not fully implemented; recommends involving non-government actors through collaborative models.
8	Abdul Gafur, Fatmawati Mappasere, H. Parawu, Nasrulhaq, Fatmawati, Muhammad Ahsan Samad	Collaborative Leadership in Waste Management: A Case Study of Watampone City, Indonesia	Collaborative leadership positively impacts waste management; recommends clear stakeholder role mapping.
9	M. Noer, Falaq Al Amin, R. Fitrie, Adelia Safira	Collaborative governance in Waste Management: A Study from Surabaya Smart City Programme	Collaboration with private sector and community increases recycling and public awareness through waste banks.
10	Iis Indrianti, Mario Anata, Abdul Zainuddin	Innovation in Waste Management Policies from the Point of View of Good Governance in West Nusa Tenggara	Waste management unsatisfactory; innovation and international collaboration needed for improvement.
11	Johan Bhimo Sukoco, A. Wijaya, L. Mindarti, Mohammad Nuh	Waste Governance and Empowerment: Evidence from Ponorogo, Indonesia	Weak collaboration between community and academics; recommends strengthening local leadership and stakeholder engagement.
12	S. Suryani	Domestic Waste Management Based on Collaborative Governance in Pekanbaru City	Stakeholder collaboration is suboptimal due to lack of programs and awareness; conventional methods still dominate.
13	Fatmawati Fatmawati, Nuryanti Mustari, Haerana Haerana, R. Niswaty, Abdillah Abdillah	Waste Bank Policy Implementation through Collaborative Approach: Comparative Study- Makassar and Bantaeng, Indonesia	Waste bank policy not optimal; communication and participation among stakeholders need improvement.
14	Hidayat Chusnul Chotimah,	Model Collaborative Governance dalam Pengelolaan Sampah	Collaborative governance is crucial for marine plastic waste; multi-stakeholder

	Muhammad Ridha Iswardhana, Lucitania Rizky	Plastik Laut Guna Mewujudkan Ketahanan Maritim di Indonesia	action and shared responsibility needed.
15	Idris Idris, Dian Herdiana, Iqbal Miftakhul Mujtahid	Collaborative Governance dalam Pengelolaan Sampah di Wilayah Kecamatan Pulau Tiga Barat Kabupaten Natuna	Collaborative governance operates well but is hindered by insufficient budget allocation.

Source: Research results, 2025

A systematic review of 15 recent papers reveals a nuanced landscape of collaborative governance in Indonesian waste management, highlighting both progress and persistent challenges across diverse regions and program types. Several studies identify asymmetrical power relation, fragmented institutional arrangements, and weak participatory processes as major obstacles. For example, in Malang, despite formal policy commitments, bureaucratic dominance and unclear coordination mechanisms limit genuine community involvement and hinder the achievement of sustainable development goals. The authors recommend shifting from symbolic participation to true co-creation, institutionalizing multi-stakeholder forums, and empowering informal actors (Gunawan, 2025). In Bali, collaborative governance frameworks exist, but community participation and compliance remain low due to a lack of shared goals, weak law enforcement, and insufficient public awareness. The involvement of the private sector and innovative programs like TOSS and TPS 3R are promising, but require stronger facilitative leadership and clearer alignment among stakeholders (Ain et al., 2021).

Bandung's experience demonstrates that while collaborative governance has been implemented through programs like KangPisman, the approach is still semi-formal and heavily reliant on partner commitment. Stakeholder roles are not always clearly defined, and the division of responsibilities is incomplete. Researchers recommend a three-stage collaborative model, scaling from source-level to city-wide management (Kurhayadi, 2021). The waste bank model in Gresik and other regions exemplifies structured collaboration among government, private sector, and community. However, the private sector's role is often limited, and a shared vision among stakeholders is lacking, which hampers optimal outcomes (Hertati & Arif, 2022). When viewed from the perspective of regional and programmatic variations, Sidoarjo's TPST Tambakrejo: collaboration is running well, but some obstacles persist, such as resource constraint and the need for ongoing stakeholder engagement (Amelinda & Kriswibowo, 2021). In Greater Bandung, good governance principles are not fully implemented, especially regarding participation and transparency. Involving non-government actors is essential for more effective collaboration (Rochmansjah, 2024). In Wetampone, Collaborative leadership rooted in local culture (gotong royong), positively impacts waste management, but requires clear mapping of stakeholder roles (Gafur et al., 2023). In Garut, digital tools like WhatsApp groups facilitate communication, but limited membership restricts broader regional impact. Surabaya, collaboration with the private sector and community through waste banks increase recycling and public awareness (Falaq Al Amin et al., 2023).

Empowerment is often weak, as seen in Ponorogo, where collaboration between community and academics is minimal. Strengthening local leadership and stakeholder engagement is recommended to mobilize community-based waste management

(Sukoco et al., 2024). In Makassar and Bantaeng, waste bank policies are not fully optimized due to insufficient communication and participation among stakeholders (Fatmawati et al., 2022). Several papers stress the need for policy innovation, international collaboration, and the adoption of good governance principles (participation, transparency, consensus orientation). Integration and synchronization between central and local governments are crucial for sustainable outcomes. In marine and rural contexts, addressing marine plastic waste requires multi-stakeholder action and shared responsibility, as highlighted in studies on Bali and national maritime resilience (Chotimah et al., 2022). In rural areas like Natuna, collaborative governance is functioning but hampered by budget constraints (Idris et al., 2022). If there are gaps in governance assessment and research, the governance assessment in Makassar shows that although local government and the community are key actors. The governance context is often restrictive, limiting the success of waste reduction programs (Latanna et al., 2023). Across the literature, there is a call for more empirical evaluation of long-term impacts, better integration of private sector roles, and scaling of successful models. This review also contains a synthesis and recommendations, namely collaborative governance improves waste management outcomes when stakeholder roles are clear, resources are sufficient, and there is strong facilitative leadership. Persistent barriers such as power imbalances, unclear roles, and limited participation must be addressed for collaboration to move beyond symbolic gestures. Then in policy reforms, digital infrastructure, and community empowerment are essential for transforming waste governance into a more inclusive and effective system. Future research should focus on evaluating the scalability and sustainability of collaborative models, especially in under-studied rural and marine contexts.

The literature demonstrates that collaborative governance is essential for addressing Indonesia's waste management challenges, but its effectiveness is contingent on overcoming significant structural and participatory barriers. High-quality studies emphasize the importance of integrating advanced technologies, fostering community empowerment, and ensuring clear institutional arrangements. However, many collaborative initiatives remain at the policy or pilot stage, with limited evidence of large-scale, sustained impact. While the evidence base is growing, more empirical research is needed to evaluate the long-term outcomes of collaborative governance models and to identify best practices for scaling successful interventions. Despite progress, research gaps remain in evaluating the long-term effectiveness of collaborative models, understanding the role of the private sector, and scaling successful interventions across diverse regions.

Topic/Attribute	Urban Areas	Rural Areas	Marine/Coastal	Digital/IoT Solutions	Circular Economy
Stakeholder Integration	6	2	3	2	3
Community Empowerment	4	2	2	1	2
Policy/Regulatory Reform	5	1	2	1	1
Private Sector Engagement	2	1	1	1	1
Long-term Impact Evaluation	1	GAP	GAP	GAP	GAP

Figure 2. Research Gaps Matrix

Source: Research results, 2025

The research gaps matrix highlights both well-studied areas and significant gaps that need further attention. The matrix is constructed by mapping key topics (such as stakeholder integration, community empowerment, policy reform, private sector engagement, and long-term impact evaluation) against different context (urban, rural, marine/coastal, digital/IoT solution, and circular economy). In urban areas, there is relatively strong research on stakeholder integration, with many studies examining how government, private sector, and communities collaborate in cities like Malang, Bandung, and Surabaya. On the other hand, rural and marine/coastal areas are less studied, with only a few papers addressing collaborative governance in places like Natuna or Bali’s coastal regions. Digital/IoT and circular economy approaches are emerging but still underrepresented in the literature. There is moderate research on community empowerment in urban settings, often focusing on waste banks and local leadership.

Rural and marine context, as well as digital empowerment strategies, are less explored, indicating a need for more studies on how to mobilize and empower communities outside major cities. Policy and regulatory issues are frequently discussed, especially regarding the need for clearer roles, better coordination, and stronger enforcement in urban areas. However, research on how these reforms play out in rural, marine, or digital context is limited. While some urban studies discuss the role of the private sector, there is a lack of research on effective models for private sector involvement in rural, coastal, and digital waste management initiatives. Then, very few studies provide long-term evaluations of collaborative governance models, especially outside urban areas. Most research focuses on short-term outcomes or process evaluations, leaving a gap in understanding sustainability and scalability. Based on the research gap matrix above, future research should focus on evaluating the scalability and sustainability of collaborative governance models, the integration of digital technologies, and the mechanisms for effective private sector engagement. Furthermore, future research should focus on evaluating the scalability and sustainability of collaborative models, particularly in the context of rural and maritime areas, which have been understudied.

CONCLUSION AND RECOMMENDATION

Conclusion

The systematic review of 15 papers reveals that collaborative governance, supported by digital innovation, circular economy principles, and inclusive stakeholder engagement, is crucial for advancing waste management in Indonesia. However, persistent barriers related to institutional fragmentation, resource limitations, digital divide, and policy enforcement must be addressed to realize the full potential of collaborative governance. Overall, collaborative governance has demonstrated the potential to improve waste management outcomes, particularly when supported by strong leadership, clear goals, and active participation from all stakeholders. However, its success is not automatic and depends on overcoming existing barriers. Collaborative governance holds significant promise for waste management in Indonesia, but addressing persistent barriers and research gaps is crucial for achieving sustainable, system-wide improvements.

Recommendation

To enhance the effectiveness of collaborative governance in waste management in Indonesia, several strategic steps need to be considered. First, strengthen multi-stakeholder engagement by establishing formal platforms for dialogue that include the government, community groups, informal sector workers, private companies, and NGOs. Second, shift from a control approach to co-creation by encouraging collaborative policy design where all stakeholders actively participate. Third, it is essential to synchronize policies between central and local levels and scale collaborative models from household and neighborhood levels to broader regional and city-wide management. Additionally, communication and capacity building should be enhanced to raise public awareness and promote behavior change. Lastly, future research should focus on evaluating the scalability and sustainability of collaborative models, especially in under-researched rural and marine contexts. These steps will help transform symbolic participation into genuine, effective collaboration for sustainable waste management.

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