

Dynamics of conflicts in waste management: A review of literature and global issue mapping (2020-2025)

Qurnia Indah Permata Sari*

Department of Political Science, University of Brawijaya, Veteran Street, Malang City, 65145, Indonesia.

*Corresponding author, email: qurniindahpermatasari@ub.ac.id

Article History

Received: 30 August 2025

Revised: 15 October 2025

Accepted: 18 November 2025

Published: 1 December 2025

Keywords

Bibliometric analysis

Environmental sustainability

Policy Conflict Framework (PCF)

Waste governance

Abstract

Policy conflicts in waste management are increasingly recognized as central challenges in environmental governance, particularly within decentralized and urbanizing contexts. This study conducts a bibliometric analysis of 42 peer-reviewed journal articles published between 2020 and 2025 to map global research trends and identify thematic gaps in the study of waste governance conflicts. Using the Policy Conflict Framework (PCF) as an analytical lens, we examine the interplay of actors, interests, and institutional dynamics shaping policy disputes across different countries and governance settings. The results reveal a modest but significant body of literature, with annual publication rates peaking in 2023 before declining in 2025. Despite this decline, citation analysis suggests that interest in the topic remains active. Keyword and co-occurrence analyses show a dominance of terms such as "governance" and "urban waste," while conflict-related concepts remain marginal, indicating a persistent gap in integrating political perspectives into waste management research. Thematic maps further demonstrate that while technical and sustainability themes are well-established, conflict resolution, intergovernmental frictions, and participatory governance remain underdeveloped. This review underscores the importance of expanding conflict-sensitive approaches to environmental policy. By combining bibliometric insights with PCF, we propose a more nuanced understanding of how stakeholder resistance, institutional fragmentation, and regulatory misalignment influence waste governance outcomes. The study concludes with recommendations for future research and policy, emphasizing the need for multi-actor, theory-informed, and context-sensitive frameworks to address the complex realities of conflict in waste management systems.

How to cite: Sari, Q. I. P. (2025). Dynamics of conflicts in waste management: A review of literature and global issue mapping (2020-2025). *Journal of Environment and Sustainability Education*, 3(4). 472–484. doi: 10.62672/joease.v3i4.107

1. Introduction

Waste management has evolved into a complex governance issue, no longer confined to technical engineering but entangled with political, social, and institutional dynamics (Borowy et al., 2024a; Minhas et al., 2023). Although decentralization is generally intended to clarify authority distribution and strengthen public participation, in practice, weak institutional capacity, overlapping regulations, and the absence of effective coordination mechanisms often lead to intergovernmental tensions in waste policy implementation (Cardoso et al., 2023).

Empirical studies across countries reveal that waste management policies which neglect local contexts and political dynamics frequently face public resistance and socio-political backlash. In Mozambique, for example, public-private partnerships in waste services have triggered discontent among informal settlement residents who feel marginalized in service delivery (Tvedten & Candiracci, 2018). In Indonesia, the long-standing conflict between DKI Jakarta and the City of Bekasi over the Bantargebang landfill highlights how asymmetries in expectations, contributions, and environmental burdens can evolve into prolonged policy disputes (Mulyadin et al., 2018). Similar resistance to landfill development in Salatiga, Cimahi, and Ambon illustrates the persistence of the NIMBY (Not In My Backyard) phenomenon and the limitations of top-down environmental planning (Pujiyanto, 2024; Sari et al., 2020; Siregar, 2024).

Despite growing attention to waste governance, most recent literature still tends to emphasize technical innovation and sustainability narratives (Islam et al., 2024), while overlooking the inherently political and conflictual dimensions of policy implementation such as actor disputes, policy failure, and interjurisdictional misalignments. Although scholars like Rafiq et al. (2023), have explored socio-cultural and ethical dimensions of waste practices, conflict remains a peripheral theme.

Recent bibliometric efforts have attempted to map the thematic evolution of waste policy research (Gorzeń-Mitka et al., 2020; Sánchez et al., 2023), including aspects of stakeholder roles (Aver et al., 2023), circular economy (Islam et al., 2024), and governance responses during the COVID-19 pandemic (Kuntari et al., 2023). Cardoso et al (2023) highlight conflicts in e-waste recycling, emphasizing the tensions between regulatory, private, and civic actors. However, these studies rarely utilize conflict-based theoretical models such as the Policy Conflict Framework (PCF), which would help explain why these actor tensions persist and how governance outcomes are shaped by value disputes.

Several scholars (Alonso-Muñoz et al., 2022; Fernández-Arias et al., 2023) continue to focus on system efficiency, stakeholder engagement, or sustainability metrics. However, a significant research gap persists in the explicit analysis of intergovernmental conflicts using theory-driven approaches like PCF, especially within bibliometric studies. This thematic and analytical gap limits the ability of waste governance literature to capture deeper institutional and political tensions, particularly in decentralized governance contexts.

Therefore, this study seeks to address this gap by integrating bibliometric analysis with the Policy Conflict Framework to examine how conflict discourse has been thematically absent or underrepresented in waste governance literature between 2020 and 2025. This approach offers a critical lens for understanding how governance problems are constructed, contested, or neglected across disciplinary traditions and geographic settings.

2. Method

This study employed a bibliometric approach to explore the dynamics of policy conflicts in waste management governance at both national and global levels. Bibliographic data were retrieved from the Scopus database, selected for its credibility and comprehensive coverage of peer-reviewed literature. The search was conducted on May 28, 2025, using the following search string: "waste management" AND "policy conflict" OR "intergovernmental conflict" OR "urban waste" OR "solid waste management". To ensure a systematic and transparent selection of relevant studies, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram was utilized to illustrate the screening process. This diagram details the number of records identified, included, and excluded through each stage of the review process. The initial search yielded 99 documents. These were screened based on publication year (2020–2025), document type (journal articles), and publication stage (final). After applying inclusion and exclusion criteria, a total of 42 articles were selected for further analysis. The following prism flow diagram in this study is shown in Figure 1.

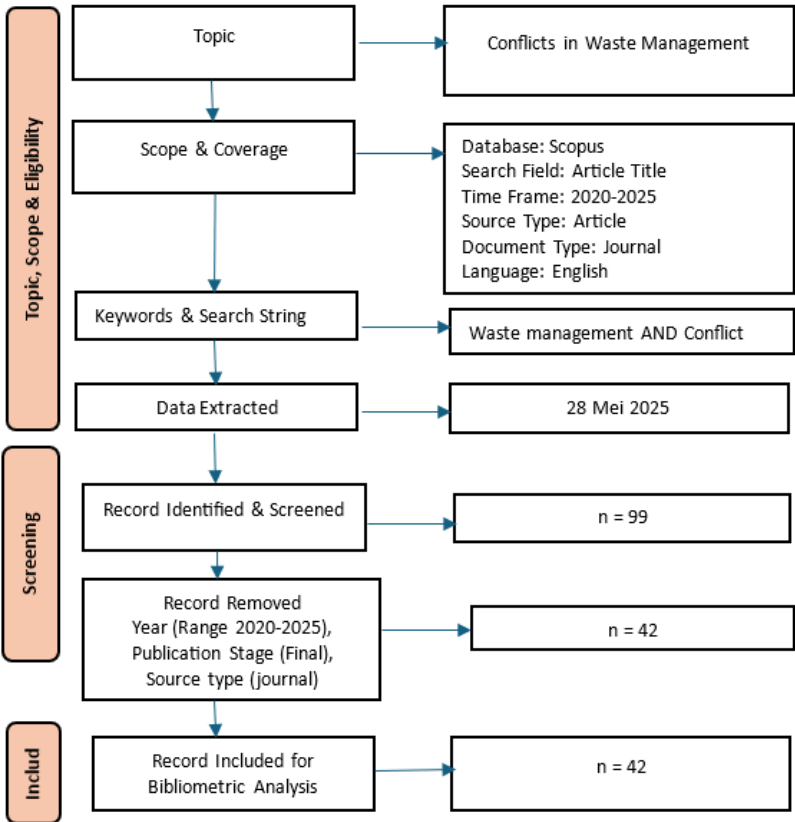


Figure 1. Prisma Flow Diagram

The research framework utilized in this study follows a well-established protocol for bibliometric analysis as proposed by Aria & Cuccurullo (2017) and refined through the best practices outlined by Donthu et al. (2021). This structured approach ensures the analysis is both systematic and comprehensive, concentrating on mapping the knowledge structures embedded in the selected literature (Alao et al., 2024; Salim et al., 2023). The use of the Bibliometrix R-package via the Biblioshiny platform enables advanced processing of bibliographic metadata and the generation of visual networks and thematic maps, which are essential in identifying scholarly trends and thematic gaps (Alao et al., 2024; Hakam et al., 2023; Salim et al., 2023).

The analysis in this study is exploratory and descriptive in nature, deliberately foregoing inferential statistics in favor of qualitative mapping techniques. This approach aligns with prior bibliometric studies in policy research (Sabri et al., 2024; Silva et al., 2022). By applying visualization techniques such as force-directed layouts for co-occurrence networks, co-citation analyses, and thematic evolution maps, the study builds upon established trends in bibliometric research (Hasnan et al., 2024; Oktavianto & Hardini, 2024; Silva et al., 2022), reinforcing its findings through cumulative evidence across multiple studies. The methodology further incorporates a stringent filtering process, with a minimum threshold of five keyword occurrences, aimed at enhancing the clarity of visual outputs while minimizing analytical noise (Demir & Tekinarslan, 2022; Susanto, 2023; Wahyuni & Wulandari, 2024).

Following the theoretical framework of the Policy Conflict Framework (PCF), the research interprets the dynamics at play in policy-making processes, especially within the context of environmental governance. The framework aids in elucidating how diverging interests and values impact policy cohesion, providing a lens to understand the interplay between actor constellations and value conflicts (Maulida & Kassim, 2023; Plasencia et al., 2018). This insight is augmented by bibliometric studies that highlight keyword trends and their evolution within policy contexts, illustrating the relevance of historical and contemporary discourses in shaping future research directions (Hassan & Ara, 2021; Sahu, 2024; Silva et al., 2022).

Compared to other prominent frameworks such as the Advocacy Coalition Framework (ACF) and Multi-Level Governance (MLG), the PCF is selected for its explicit focus on the negotiation and contestation among actors with diverging goals and values, which is particularly pertinent to the study of intergovernmental conflicts in waste management. While ACF emphasizes coalition building and shared belief systems, PCF centers on the processes of conflict and value tensions shaping policy outcomes.

3. Results and Discussion

This study identified 42 journal articles published between 2020 and 2025 focusing on policy conflicts in waste management governance. As illustrated in Figure 2, the annual scientific production displays a fluctuating pattern, peaking in 2023 before dropping significantly in 2025. This decline reflects an annual growth rate of -16.74%, signaling a contraction in scholarly output over the six-year period.

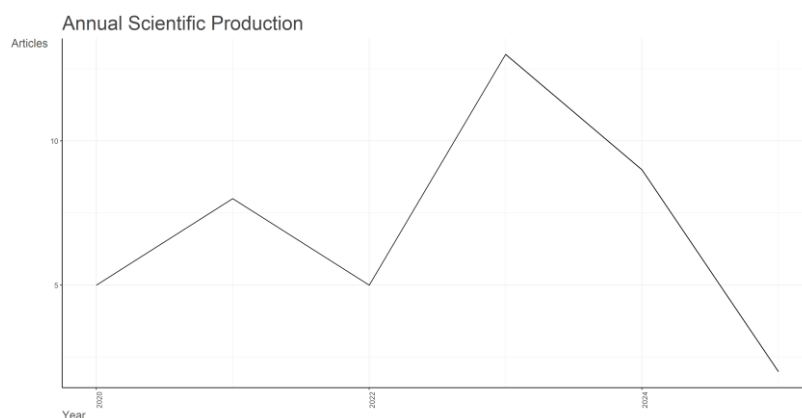


Figure 2. Annual Scientific Production

Several factors may explain this downward trend. First, evolving research agendas and funding priorities may have shifted scholarly focus toward more technical or solution-based approaches, such as circular economy and waste-to-energy initiatives (Fernández-Arias et al., 2023; Rafiq et al., 2023). Second, the topic of stakeholder conflicts in decentralized waste systems may be perceived as politically sensitive or under-theorized, discouraging academic engagement. Lastly, COVID-19-related disruptions likely affected research productivity and publication timelines across global academic institutions.

Despite this reduction in volume, the scholarly impact remains moderate. The average number of citations per article stands at 8.14, indicating continued relevance of the topic among researchers. As depicted in Figure

3, the average citation rate peaked in 2022, followed by a sharp decline in 2024 and a modest rebound in 2025 (Borowy et al., 2024b; Cardoso et al., 2023).

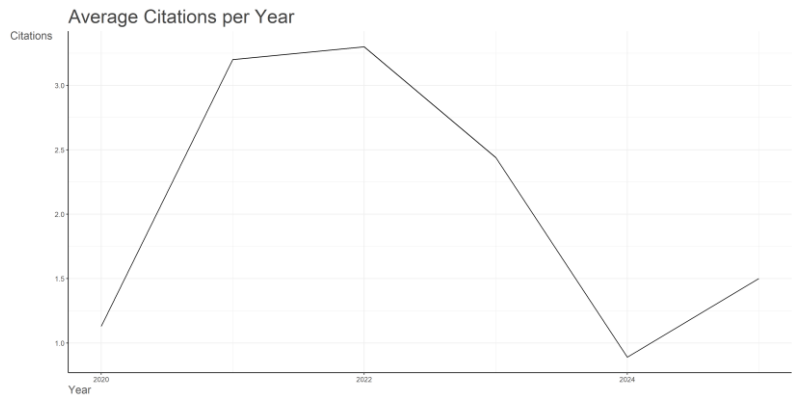


Figure 3. Average Citations per Year

The volatility in citation trends may reflect a combination of delayed citations for recent publications, reduced visibility of newer articles, and shifting research preferences toward broader sustainability themes. Notably, these fluctuations emphasize the strategic importance of thematic positioning and timing in publishing impactful environmental governance studies (Sahu, 2024; Borowy et al., 2024a).

This pattern underscores the importance of strategic thematic positioning and timely dissemination in maximizing the impact of environmental policy research. This decline in production and citation may also reflect the epistemic tensions outlined in the Policy Conflict Framework (PCF), where certain policy domains become depoliticized or strategically ignored in favor of dominant governance narratives (Plasencia et al., 2018; Maulida & Kassim, 2023). Such tensions could discourage sustained academic engagement in conflict-laden themes like waste governance, especially in decentralized settings.

Keyword analysis further reveals that while terms like waste management and governance are dominant, conflict-specific terms such as contestation and policy conflict remain underrepresented, as visualized in Figure 4 through the Three-Field Plot.

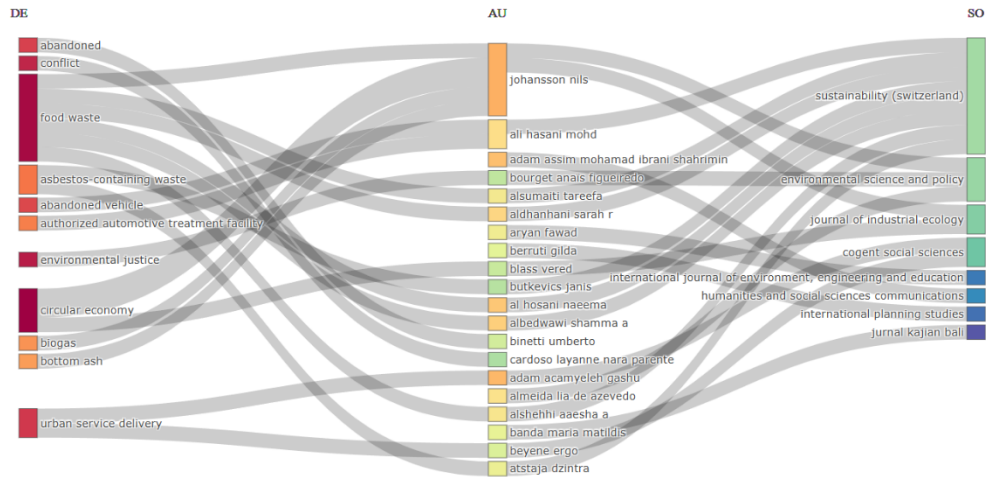


Figure 4. Three-Field Plot

This suggests a conceptual gap in integrating political science perspectives within the environmental policy discourse. According to Plasencia et al. (2018) and Maulida & Kassim (2023), this gap can be bridged through the application of the Policy Conflict Framework (PCF), which allows researchers to uncover the value-laden and contested nature of environmental decision-making. PCF is particularly useful for explaining intergovernmental frictions and policy fragmentation within decentralized systems.

In addition, Figure 5 highlights the most relevant publication sources, with journals such as Waste Management, Journal of Environmental Management, and Sustainability dominating the field. These journals

reflect the interdisciplinary nature of this research domain, combining environmental science, urban planning, and public administration.

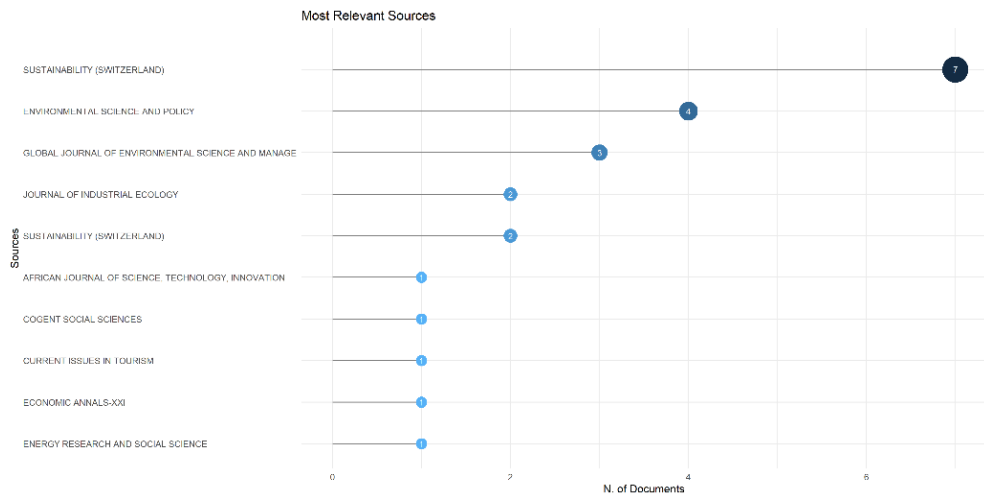


Figure 5. Most Relevant Sources

The clustering of articles in these journals suggests that waste policy conflicts are often examined within broader environmental governance and sustainability contexts, rather than as standalone political phenomena. This trend echoes critiques by Alonso-Muñoz et al. (2022), who argued that environmental policy research often privileges technocratic and consensus-based approaches, leaving structural conflicts underexplored.

A more comprehensive understanding of the academic landscape is offered in Figure 6, which visualizes the keyword cloud. Terms such as governance, urban waste, and policy appear prominently, while conflict-specific terms remain marginal.



Figure 6. Worldcloud

This pattern reinforces the earlier observation that conflict-related discourses are not central to the existing literature, despite real-world tensions surrounding landfill siting, incinerator opposition, or interjurisdictional disputes (Hasnan et al., 2024; Sari et al., 2020).

Figure 7 presents a thematic map generated using co-word analysis, positioning clusters of keywords based on centrality and density. The upper-right quadrant represents motor themes such as “governance,” “solid waste,” and “urban planning,” reflecting established and strongly developed topics. Emerging or declining themes, located in the lower-left quadrant, include less frequently used but potentially novel terms such as “participation,” “conflict resolution,” and “intergovernmental tension.” This pattern aligns with observations by Silva et al. (2022) and Sahu (2024), who noted the relative underrepresentation of power struggles and contestation dynamics in waste governance literature. Thematic mapping thus highlights a gap in policy conflict literature, especially concerning the political dimensions of waste management an area well-suited for deeper application of the Policy Conflict Framework (Plasencia et al., 2018; Maulida & Kassim, 2023).

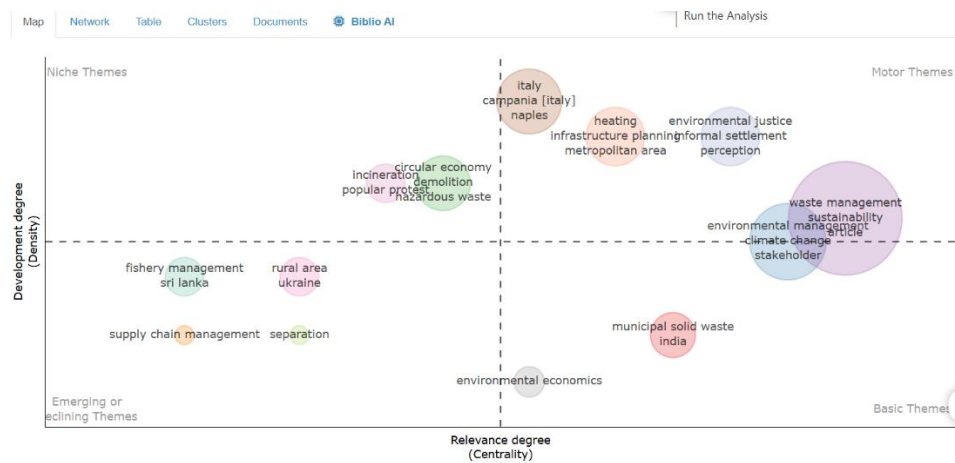


Figure 7. Thematic Map

Lastly, Figure 8 maps the distribution of corresponding authors' countries, dominated by research output from Indonesia, Malaysia, and Brazil. This geographical trend aligns with the prevalence of policy conflicts in urbanizing economies where environmental governance faces complex social and institutional challenges (Cardoso et al., 2023; Susanto, 2023).

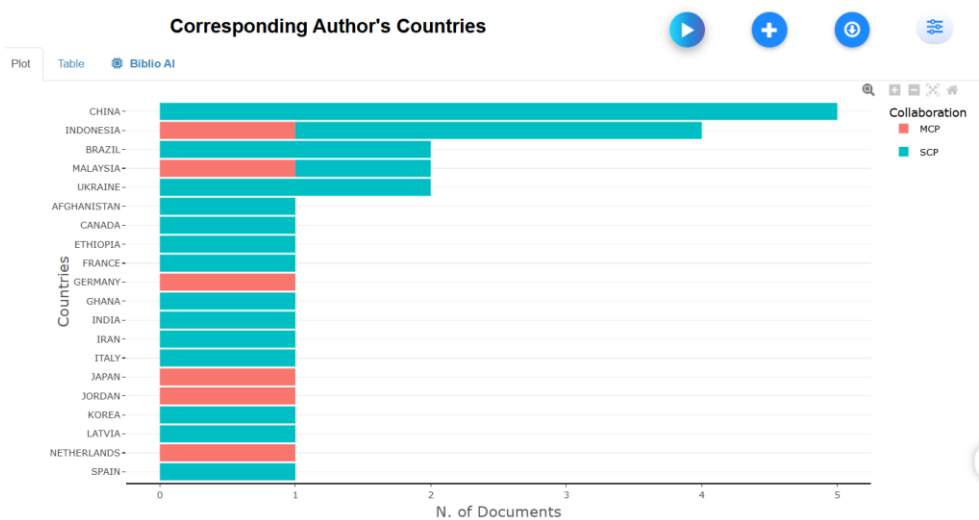


Figure 8. Corresponding Author's Countries

From a Policy Conflict Framework (PCF) lens, the placement of governance approach and urban planning as underdeveloped themes is particularly revealing. These are areas where conflicting interests, bureaucratic fragmentation, and citizen resistance often manifest yet the thematic analysis suggests limited conceptual elaboration on these aspects. Thus, while the field is rich in applied and technical studies, the integration of political-conflict analysis within core themes remains weak. This finding reinforces the need to strengthen theory-informed research that unpacks how governance struggles shape waste management outcomes at multiple scales.

This analytical gap is not merely conceptual but also methodological. As noted by Weible & Heikkila (2017), environmental policy conflicts are frequently embedded within complex social network structures that influence actors' belief systems, access to resources, and strategic behavior. These networked relationships particularly in decentralized waste governance often reinforce institutional fragmentation and escalate opposition. For instance, overlapping mandates between local and national agencies, exclusionary planning processes, and asymmetric access to decision-making forums may heighten stakeholder tensions and obstruct policy coherence.

Such networked conflicts are not always detectable through bibliometric tools like co-word or thematic mapping, as they manifest in case-specific institutional configurations. This may explain why policy conflict appears marginal in the keyword and thematic clusters, despite its prominence in individual studies. Therefore, a closer document-level analysis is essential to uncover latent patterns of contestation that escape traditional bibliometric representations.

Although conflict as a thematic cluster is not dominant in the co-occurrence or thematic evolution maps, a close inspection of individual documents reveals a handful of studies that address policy disputes more explicitly. Table 1 highlights selected articles that examine conflict-related dynamics in waste governance, illustrating the diversity of contexts from local resistance and NIMBYism to intergovernmental tensions and coalition-based protests (Weible & Heikkila, 2017).

Table 1. Conflict-related dynamics in waste governance

No	Article Title, Author	Year	Conflict Focus
1.	An Evolutionary Game Theoretical Analysis to Conflicts among Stakeholders Involved in the Operation of Municipal Waste Incineration (Yu et al., 2020)	2020	Strategic conflict between local governments and operational enterprises in the management of municipal waste incineration
2.	The diversity of divestment in Singapore: Junk commodities (Andersson et al., 2020)	2020	Political-economic tension in privatized waste flows
3.	Problem complexity and narratives in Moscow's waste controversy (Schlauffer et al., 2021)	2021	Policy conflict in Moscow's waste management is driven by competing narratives about problem complexity, where the government downplays complexity to contain conflict, while non-governmental actors amplify it to highlight political failures.
4.	Situation, Challenges, and Solutions of Policy Implementation on Municipal Waste Management in Vietnam toward Sustainability (Trinh et al., 2021)	2021	The core conflict lies in the gap between national policies and local implementation of solid waste management in Vietnam, due to unrealistic policies, implementation difficulties, and lack of necessary resources.
5.	Constructed Governance as Solution to Conflicts in E-Waste Recycling Networks (Pedro et al., 2021)	2021	Conflicts in e-waste management arise from diverging interests between commercial and sustainability goals, lack of legal knowledge, and asymmetries in values and sustainability culture among actors in the recycling network.
6.	Negotiations and Conflict in Waste Pickers' Cooperative (Conceição Ribeiro et al., 2021)	2021	Internal and external conflict in cooperative establishment
7.	How to handle the policy conflict between resource circulation and hazardous substances in the use of waste? (Johansson & Krook, 2021)	2021	There is a policy conflict in the circular economy between promoting resource circulation and limiting the dispersal of hazardous substances in waste.
8.	Altered urban landscape: Shedding light on conflicts in a landfill community in Ghana (Owusu-Sekyere, 2022)	2022	The conflict arises from unilateral land acquisition by municipal authorities without compensation, exclusion of local communities from site management, and environmental and economic degradation caused by the landfill.
9.	Public participation and city sustainability: Evidence from Urban Garbage Classification in China (Zhang et al., 2022)	2022	Governance resistance, public compliance tensions
10.	Waste Siege: The Life of Infrastructure in Palestine (Solomon, 2022)	2022	Infrastructural injustice and state-society tensions in waste governance
11.	Managing municipal waste in China from a standpoint of social governance (Zhang et al., 2022)	2022	Administrative conflicts in social governance reforms
12.	Waste governance agenda in Nigerian cities: A comparative analysis	2023	Intergovernmental and regulatory conflict
13.	Analisis Penyelesaian Konflik Dampak Pembakaran Sampah Terhadap Kesehatan Lingkungan Dan Masyarakat Di Desa Cikaret RT 06 RW 08 Kecamatan Bogor Selatan (Wulandari, 2023)	2023	Social-environmental conflict due to unregulated waste burning impacting community health
14.	Konflik Dalam Pengembangan Nilai Bisnis Sampah Rumah Tangga Pada Kelompok Swadaya Masyarakat (KSM) Rejoagung Berseri di Desa Rejoagung, Kecamatan Ploso, Kabupaten Jombang (Fanani, 2023)	2023	Internal managerial conflict and external community resistance in grassroots waste business management
15.	Constructed Governance in E-Waste Recycling Networks (Giglio et al., 2023)	2023	Recyclers, authorities, EPR orgs,
16.	E-Waste Management: An Analysis under the Perspective of Conflicts and Shared Responsibility (Cardoso et al., 2023)	2023	Stakeholder-based intergovernmental conflict in e-waste management
17.	Conflicts and synergies between customary land use management and urban planning in informal settlements (Geyer, 2023).	2023	The core conflict lies between customary land management systems (CLMS) and formal urban planning authorities, driven by overlapping regulations and contested legitimacy in governing informal settlements.

18.	Conflicts of Interest in the Assessment of Chemicals, Waste, and Pollution (Schäffer et al., 2023)	2023	Institutional conflict of interest in scientific assessment and policy influence related to chemicals, waste, and pollution.
19.	Enhancing Sustainability Development for Waste Management through National-Local Policy Dynamics (Ratnasari et al., 2023)	2023	Policy misalignment and coordination challenges between national and local governments in implementing sustainable waste management strategies
20.	From Waste to Renewable Energy: A Policy Review on Waste-to-Energy in the Philippines (Anonas et al., 2023)	2023	policy conflict between waste minimization efforts and the promotion of Waste-to-Energy (WtE) as a source of renewable energy.
21.	Introduction: The Waste of Conflict. The Conflicts of Waste (Borowy et al., 2024a)	2024	A conflict between military-political priorities and environmental and public health concerns, where warfare and confrontational contexts push waste management and its consequences to the background.
22.	Tri Lulu: Community Resistance to Source-Based Waste Management Policies in Badung Regency Bali (Dalem et al., 2024)	2024	The conflict in Bali's waste management arises from community resistance to misaligned regulations, policy overlaps (hyperregulation), and the disruption of local cultural values due to demographic and economic pressures.
23.	E-Waste Management: An Analysis under the Perspective of Conflicts and Shared Responsibility	2023	The conflict occurs between the government and companies due to differences in commitment and responsibility in implementing the shared responsibility principle, particularly in the reverse logistics process of e-waste management.
24.	Diversion of Asbestos-Containing Waste from Landfilling: Opportunities and Challenges (Butkevics & Atstaja, 2025)	2025	The core conflict lies between the government, the public, and technology providers, driven by the tension between the need for safe and sustainable asbestos waste management and the limitations of public awareness, funding capacity, and technological readiness.
25.	Unraveling Vertical and Horizontal Conflicts in Indonesia's Waste Management Problem (Candra, 2025)	2025	Conflicts in waste management arise both vertically between the public and the government due to dissatisfaction and alleged corruption, and horizontally among community members due to differing waste management practices.

Drawing upon 25 studies listed in Table 1, this review identifies five dominant types of policy conflict in waste governance: actor-based conflict, intergovernmental and institutional conflict, regulatory design conflict, narrative conflict, and resource-legitimacy conflict. These categories illuminate the political nature of waste management disputes across diverse geographies and institutional contexts:

a. Actor-Based Conflicts

These conflicts involve tensions between different stakeholders: government authorities, communities, private sector actors, and informal workers. For instance, vertical conflicts emerge between governments and citizens in cases of community resistance, such as in Bali (Dalem et al., 2024) and (Owusu-Sekyere, 2022), where local populations oppose landfill siting or top-down waste regulations. Horizontal conflicts occur within communities, as seen in Indonesia (Candra, 2025), where divergent waste practices lead to friction among residents. Internal tensions also arise in grassroots organizations, exemplified by managerial disputes in a community-based waste initiative in Jombang (Fanani, 2023) and in waste picker cooperatives in Brazil (Conceição Ribeiro et al., 2021).

b. Intergovernmental and Institutional Conflicts

Policy misalignment between national and local authorities is a recurring theme. In Vietnam, for example, the failure to translate national waste management policies into local practice is driven by resource constraints and unrealistic mandates (Trinh et al., 2021). Similarly, Ratnasari et al. (2023) document the lack of coordination in Indonesian policy implementation. Institutional fragmentation is further complicated in the e-waste sector, where shared responsibility frameworks often lead to blame-shifting between companies and governments (Cardoso et al., 2023; Pedro et al., 2021). Geyer (2023) highlights a distinct form of institutional conflict, where customary land management systems clash with formal urban planning in informal settlements.

c. Regulatory and Policy Design Conflicts

Some studies emphasize conflict arising from the content and design of policies themselves. Johansson & Krook (2021) describe tensions between promoting circular economy practices and mitigating toxic waste exposure. Meanwhile, in the Philippines, Anonas et al. (2023) note conflict between waste minimization goals and the push for Waste-to-Energy (WtE) technologies. Hyperregulation and policy overlaps disrupt traditional norms and values, especially in culturally sensitive areas like Bali (Dalem et al., 2024). These design-level conflicts reveal the consequences of poorly harmonized or overly technical regulatory instruments.

d. Narrative and Epistemic Conflicts

Building on the Policy Conflict Framework (PCF), several studies uncover how competing narratives fuel conflict. In Moscow, for instance, the government minimizes the complexity of waste issues to deflect blame, while civil society actors frame it as a governance failure (Schlaufer et al., 2021). Similarly, Schäffer et al. (2023) highlight how institutional conflicts of interest shape how scientific knowledge is produced and applied in waste and pollution policy. These examples echo Plasencia et al. (2018) and Weible & Heikkila (2017), who emphasize that narratives are central to policy contestation.

e. Resource, Land, and Legitimacy Conflicts

Land-based tensions are particularly pronounced in contexts where landfill development or infrastructure expansion occurs without proper consultation or compensation. Owusu-Sekyere (2022) documents the case of unilateral land acquisition in Ghana, while Borowy et al. (2024) describe how waste issues are sidelined in militarized or politically volatile zones. Conflicts also arise from asymmetries in technical knowledge, financial resources, and access to legal recourse (Butkevics & Atstaja, 2025).

These categories are not mutually exclusive but rather reflect overlapping layers of conflict embedded within waste policy processes. The typology supports the Policy Conflict Framework (PCF)'s premise that policy disagreements are shaped by diverging values, institutional rules, and actor coalitions (Weible & Heikkila, 2017; Plasencia et al., 2018). By mapping the terrain of contestation, this synthesis reveals that waste governance cannot be disentangled from the political struggles that structure access to power, resources, and legitimacy. The application of the Policy Conflict Framework (PCF) offers a valuable lens to interpret these frictions revealing how policy misalignments, stakeholder resistance, and institutional fragmentation shape governance outcomes. Moving forward, integrating conflict analysis into environmental policy studies is essential for capturing the complex political realities that underlie waste governance challenge. To synthesize the bibliometric findings and theoretical insights, Figure 9 provides an integrative conceptual map linking four core components: theoretical frameworks, conflict dimensions in waste governance, bibliometric evidence, and policy implications. This visual highlights how conflict-sensitive approaches remain underexplored despite their significance for governance and sustainability outcomes.

Waste Management: Theoretical Frameworks and Conflict Dimensions

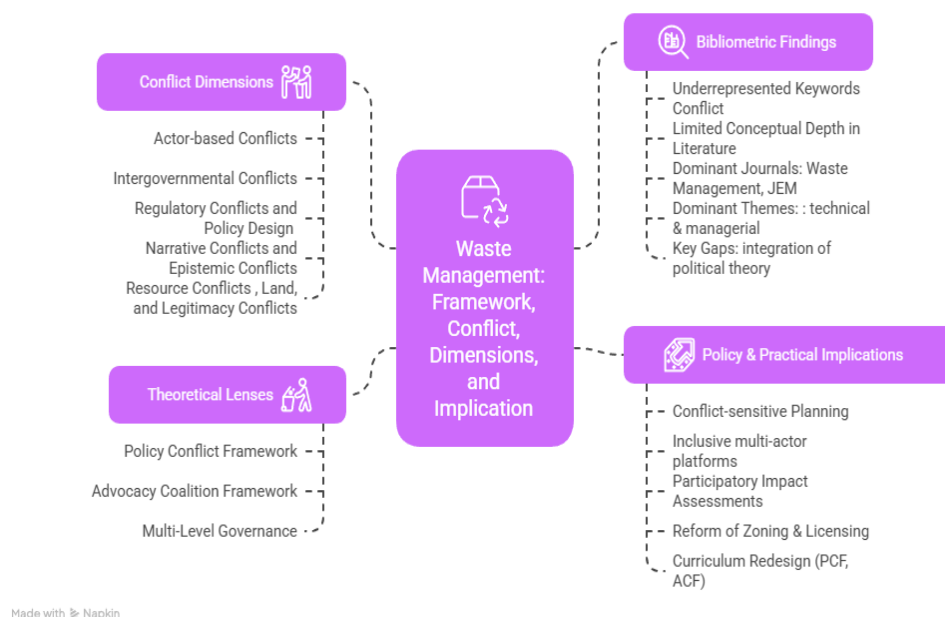


Figure 9. Integrative Framework of Conflict Dynamics in Waste Governance

Figure 9 illustrates the systemic interplay between theoretical frameworks, conflict drivers, and governance responses in waste management disputes. On the left, theoretical lenses such as the Policy Conflict Framework (PCF), Advocacy Coalition Framework (ACF), and Multi-Level Governance (MLG) provide interpretive tools to unpack actor constellations, institutional fragmentation, and contestation dynamics. The top-left quadrant maps five conflict dimensions: (1) actor-based conflicts, (2) intergovernmental and institutional tensions, (3) regulatory and policy design disputes, (4) narrative and epistemic struggles, and (5) resource and land legitimacy issues. On the top-right, bibliometric findings reveal underrepresentation of conflict-related keywords, limited conceptual depth, dominance of technical-managerial themes, and key gaps

in integrating political theory. Finally, the bottom-right quadrant translates these insights into actionable strategies conflict-sensitive planning, inclusive multi-actor platforms, participatory assessments, zoning reform, and curriculum redesign underscoring the practical relevance of conflict analysis for sustainable waste governance (Maulida & Kassim, 2023; Plasencia et al., 2018; Weible & Heikkilä, 2017).

3.1. Theoretical and Practical Implication

Theoretically, this study reinforces the importance of integrating conflict theory particularly the Policy Conflict Framework (PCF) into environmental governance literature. While sustainability and technological efficiency remain dominant paradigms (Alonso-Muñoz et al., 2022; Rafiq et al., 2023), they insufficiently account for the contested, negotiated, and politicized nature of waste policy implementation. This omission limits the explanatory power of existing models, especially in decentralized governance contexts where competing interests and institutional fragmentation are common (Plasencia et al., 2018; Maulida & Kassim, 2023). Incorporating frameworks such as PCF, Advocacy Coalition Framework (ACF) (Sabatier & Jenkins-Smith, 1999), or Multi-Level Governance (MLG) (Hooghe & Marks, 2003) offers richer analytical tools to examine actor constellations, value-based disputes, and institutional misalignments.

Practically, the findings emphasize the need for policymakers to move beyond technocratic solutions. Waste governance challenges are not merely technical, but involve deep political dynamics—power asymmetries, conflicting values, and stakeholder resistance (Weible & Heikkilä, 2017). For instance, siting landfills or enforcing zero-waste policies requires not just environmental assessments, but also conflict-sensitive planning that accounts for local resistance, trust deficits, and procedural justice (Owusu-Sekyere, 2022; Dalem et al., 2024).

Municipal governments must strengthen multi-stakeholder governance platforms, enabling early and inclusive dialogue with civil society, informal actors, and vulnerable communities (Cardoso et al., 2023). The use of anticipatory governance and scenario planning which includes political and institutional dimensions can help forecast and mediate emerging conflicts (Borowy et al., 2024a). Tools such as participatory environmental impact assessments, adaptive governance mechanisms, and conflict-sensitive zoning policies may enhance legitimacy and reduce resistance (Geyer, 2023; Butkevics & Atstaja, 2025).

Pedagogically, this study also suggests integrating conflict-sensitive environmental policy approaches into university curricula. Embedding frameworks like PCF and ACF into sustainability education equips future practitioners with the critical capacity to navigate complex, multi-actor governance disputes. As emphasized by Weible & Heikkilä (2017), building such analytical reflexivity is crucial to preparing future leaders for real-world policy turbulence.

3.2. Limitations and Directions for Future Research

While this study offers novel insights into the landscape of policy conflict in waste management by integrating bibliometric analysis and the Policy Conflict Framework (PCF), several limitations should be acknowledged. First, the dataset is limited to Scopus-indexed publications, potentially excluding relevant studies from other databases such as Web of Science, Dimensions, or regionally significant non-English publications. This may restrict the global representativeness of findings, particularly in underrepresented regions.

Second, the bibliometric approach, although powerful for visualizing trends and thematic structures, lacks the ability to capture in-depth qualitative nuances such as actor motivations, power asymmetries, or socio-political contexts driving conflict. Thus, the findings complement but do not substitute rich empirical investigations using ethnography, discourse analysis, or process tracing.

Third, the reliance on keyword-based search strategies introduces semantic limitations, where relevant articles might be excluded due to terminological variation across disciplines. Future research should consider triangulating bibliometric insights with qualitative content analysis or in-depth case studies to enhance the interpretive depth.

Moreover, comparative studies across governance regimes (e.g., centralized vs. federal systems), and the integration of emerging issues such as climate-induced waste disputes, digital governance tools, or AI-enabled stakeholder engagement, present valuable avenues for extending this research. Strengthening the dialogue between political science and environmental policy will be crucial in crafting more inclusive, adaptive, and conflict-sensitive governance models for waste management.

4. Conclusion

This study addresses the persistent analytical gap in environmental governance literature, where policy conflicts in waste management remain underexplored despite their critical implications for governance

effectiveness and sustainability outcomes. This study offers a bibliometric and conceptual synthesis of policy conflicts in waste management, drawing on 42 articles published between 2020 and 2025. By integrating the Policy Conflict Framework (PCF), this review highlights the limited yet growing attention to conflict dynamics in environmental governance literature. The findings reveal that while terms like “waste management,” “governance,” and “urban planning” dominate the thematic landscape, conflict-specific keywords such as “policy contestation,” “actor fragmentation,” and “resistance” remain peripheral. Thematic mapping and co-occurrence analyses further confirm that structural power struggles and intergovernmental tensions are not central to mainstream discourses, despite being prevalent in real-world cases. Moreover, the geographic concentration of corresponding authors in countries like Indonesia, Malaysia, and Brazil reflects the rising relevance of policy conflict studies in rapidly urbanizing regions, where decentralization, institutional fragmentation, and socio-political complexity intensify governance disputes. Case-specific evidence compiled in this review shows that such conflicts range from community opposition to landfill siting and grassroots resistance to top-down waste regulations, to institutional tensions between national and local governments.

This review underscores the need for more theory-informed research that situates waste governance within broader political and institutional conflict frameworks. Future studies should explore how values, beliefs, actor coalitions, and institutional arrangements interact to shape contestations in environmental policymaking. While technical and managerial approaches remain dominant, this study calls for a deeper recognition of political dynamics as central not peripheral to sustainable waste management. Integrating conflict sensitivity into policy design, stakeholder engagement, and academic curricula will be essential in building more inclusive, equitable, and resilient systems of environmental governance. Ultimately, this study not only maps the scholarly terrain but also calls for a paradigm shift toward integrating conflict-sensitive approaches in environmental governance research and practice. Future investigations should triangulate bibliometric insights with case-based or ethnographic analyses to capture the complex interplay of actors, interests, and institutional arrangements shaping waste policy outcomes.

Author Contributions

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

Funding

No funding support was received.

Declaration of Conflicting Interests

During the preparation of this manuscript, the authors utilized OpenAI's ChatGPT to assist in the refinement of language, improvement of logical flow, and generation of bibliometric analysis phrasing. The use of this tool was limited to language and editorial support; all data analysis, interpretation, and conceptual insights were independently conducted by the authors. All outputs generated by AI were critically reviewed and revised to ensure accuracy and originality. The authors take full responsibility for the content of this publication.

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