



Harmonizing Pancasila Principles with Collaborative Governance Politics for Sustainable Waste Management in Padang



Tengku Rika Valentina^{1*}, Roni Ekha Putera², Tirza Haqia Purnama²

¹ Department of Political Science, Faculty of Social and Political Sciences, Universitas Andalas, 25163 Padang, Indonesia

² Department of Public Administration, Faculty of Social and Political Sciences, Universitas Andalas, 25163 Padang, Indonesia

* Correspondence: Tengku Rika Valentina (tengkurika@soc.unand.ac.id)

Received: 01-07-2025

Revised: 03-06-2025

Accepted: 04-03-2025

Citation: T. R. Valentina, R. E. Putera, and T. H. Purnama, “Harmonizing Pancasila principles with collaborative governance politics for sustainable waste management in Padang,” *Int. J. Environ. Impacts.*, vol. 8, no. 5, pp. 865–875, 2025. <https://doi.org/10.56578/ije080503>.



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Abstract: The rapid population growth of close to 1 million people generates more than 600 tons of waste per day and will increase in 2020-2022. This has an impact on the environment and public health of Padang City so that waste management must be a priority agenda for the government. In overcoming the waste problem in Padang City, Padang City Regional Regulation No. 21/2012 on waste management has been issued, but the waste problem still exists. Government political collaboration is the key, in line with the principles of Pancasila politics that incorporate national values in sustainable governance practices. The research used a qualitative approach with a phenomenological research type and was descriptive in nature. Secondary data involved policy analysis and related literature. This research uses the theory of the stages of Collaborative Governance which consists of four stages, namely: assessment, initiation, deliberation, and implementation. Results showed the collaboration program between government, community, and private sector to overcoming waste problems has been implemented, but the implementation has not been optimal. The initiation and deliberation stages between the community and the government are not implemented, so the collaboration process between the two stakeholders is not optimal.

Keywords: Waste management; Political collaboration; Pancasila principles; Collaborative Governance Theory; Padang City

1 Introduction

The increasing volume of waste is a serious problem faced by Indonesia every year [1]. Waste that is not managed properly can have an impact on the environment and even the social and economic conditions of the community [2]. Waste can trigger environmental pollution and cause flood disasters that result in many losses [3]. Waste problems do not stop there, but also affect the quality of life and human health [4]. Waste problems are also closely related to population. The higher the population, the more waste is generated and is also influenced by the income of the population, resulting in a consumptive lifestyle that results in uncontrolled waste management [5].

Data from the Central Bureau of Statistics (BPS) of Padang City recorded that in 2022 the population was 919,145 people [6]. With a population of almost 1 million, community activities and activities generally take place massively. These conditions mark the form of spending trends and consumption patterns of the people in Padang City. Conceptually, this fact is a positive sign for the economic growth aspect in Padang City. However, on the other hand, the large consumption of food, beverages and goods presents a new potential problem in the form of waste from consumption and use.

The amount of waste in Padang City has a relatively large volume [7]. Based on data from the national waste management information system for Padang City, it confirms that waste generation from 2019-2022 has increased daily and annual waste generation with significant figures, namely in 2019 daily waste of 640.48 tons and annual waste of 233,774.32 tons, while in 2022 daily waste of 643.76 tons and annual waste of 234,973.13 tons (Table 1). These waste piles can invite new problems ranging from disturbing the comfort of the surrounding environment, causing pollution and increasing the risk of disease for the community and even often causing flooding in Padang City.

Table 1. National waste generation data

Year	District / City	Daily Waste Generation (Ton)	Annual Waste Generation (Ton)
019	241	79,655.68	29,074,322.34
2020	225	87,371.32	31,890,531.45
2021	225	78,156.32	28,527,056.27

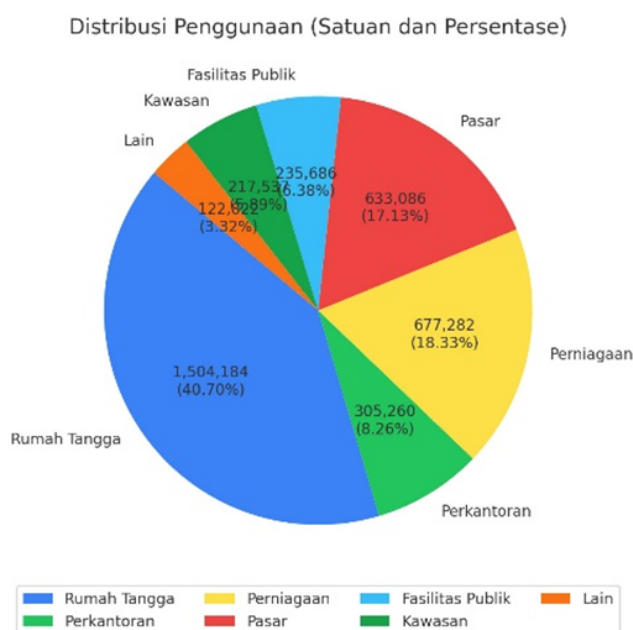
Source: National Waste Management Information System Data

The impact of poor waste management can be felt directly, especially because the landfill is open dumping, so the pile of waste will produce methane gas and leachate which is harmful to the environment and health [8]. Leachate is a liquid produced by piles of waste that contains various chemical compounds [9]. Regarding waste management, Law Number 18 of 2008 concerning Waste Management has given responsibility and authority to the government and local governments followed by the participation of the community and the business world in waste management [10, 11].

Collaborative Governance is a strategy used in planning, regulation, policy-making, and public management to coordinate, decide, and integrate the goals and interests of various stakeholders [12, 13]. In a narrow sense, Collaborative Governance is a technique used to resolve conflicts and facilitate cooperation between public institutions, interest groups, and citizens [14, 15]. It is actually used in high-conflict settings, such as those that arise in natural resource disputes or in rule-making that leads to conflict and social problems.

The task of the local government in this case is to ensure the implementation of good and environmentally sound waste management. The role of the community and the business world is to support the implementation of waste management so that it can run proportionally, effectively and efficiently [16]. Related to these duties and authorities have been determined by the Padang City Government through Padang City regional regulation number 21 of 2012 concerning waste management [17]. Implementation waste management start from planning, implementation, management institutions, incentives and disintentions and cooperation. Furthermore, the Padang City government also implements retribution for waste services as well as financing and compensation in waste management.

Since the implementation of the regional scope waste management policy in Padang City, there has been a phenomenon of waste management implementation that is still not running optimally. This can be seen from several problems in the implementation of waste management as identified in the integrated waste management action plan in Padang City (2023-2030) which is detailed as follows. First, landfills are still not managed properly where landfills are utilized in the short term, economic resources tend to be wasted, and city budgets are not used efficiently due to increased mixed waste disposal without applying the 3R principles (reduce, reuse, recycle). Second, waste pollution due to improper handling such as open burning, open dumping, and lack of waste collection. Third, the weak waste management and governance structure of various stakeholders.

**Figure 1.** National waste composition by sources

Source: National Waste Management Information System Data

The Figure 1 shows the largest sources of waste from 2019 to 2021 are household waste with a 40.95% (1519,766,493 tons), commerce with a 18.25% (677,282,047 tons), markets with a 17.06% (633,086,499 tons), offices with a 8.22% (305,259,620 tons), public facilities with a 6.35% (235,856,744 tons), areas with a 5.86% (217,537,456 tons), and others with a of 3.31% (122,821,579 tons).

In the perspective of public administration, the role of local governments has at least two main tasks, namely creating excellent public policies and providing access and implementing quality service processes within the region [18, 19]. One of them concerns policies and services in waste management. Waste management as a complex problem requires a comprehensive approach in order to create an effective and efficient management scheme involving local governments, communities and cooperation.

Also, Putra examines community empowerment through the waste bank program, providing insights into its concept and operational mechanisms. However, the study does not explore in detail how coordination and the government's role contribute to the effectiveness and sustainability of waste banks as part of a broader waste management system [20]. Meanwhile, research conducted by Rahmi and Ernawati [21] on the waste management behavior of housewives in Pauh District, Padang City. This study offers an overview of household-level waste management practices but lacks an in-depth analysis of how collaboration between the government, society, and related sectors addresses waste issues. Additionally, it doesn't provide solutions for increasing public awareness and participation in sustainable waste management [22].

Given the limitations of previous studies, further research needed to comprehensively analyze Collaborative Governance in waste management. This study aims to examine how the government establishes synergy with various stakeholders, including communities, the private sector, and environmental organizations. By doing so, it seeks to identify more effective strategies for creating a sustainable waste management system while also enhancing public awareness and engagement in maintaining environmental cleanliness.

Related to this, the Padang City government itself has actually initiated a waste bank program since 2012 but the program has only run massively and focused after the issuance of Perwako Padang Number 44 of 2018 concerning regional policies and strategies in the management of household waste and similar household waste. However, the existence of this waste bank is still not running effectively. First, the Environmental Agency (DLH) as the authorized institution in encouraging 3R-based waste management and waste banks as per the 2019-2024 Strategic Plan has not been equipped with technical guidelines and implementation guidelines so that the waste bank program is only limited to achieving targets and does not encourage sustainability in the waste bank program. Also, evidenced where in 2019 there were only 17 waste banks. In 2022 there will be 30 waste banks [23]. This also indicates that the "One Village One Waste Bank" program that has been initiated since 2019 has not reached half of the 103 villages in Padang City.

On the other hand, the community there is an participatory awareness in waste management. As a result, there are many illegal polling stations. According to the Head of the Padang City Environment Agency, Mairizon, there are 670 illegal TPS points in Padang City. Of these, 62 TPS have been disciplined while 608 TPS have not been disciplined [24].

However, data from the Padang City Environmental Agency in 2023 shows that community-based waste initiatives have contributed to a 27% reduction in illegal dumping sites since 2020 (Table 2). While progress has been made, further efforts are needed to provide accessible waste collection services in underserved areas. This research has important significance because it illustrates the effort to understand how the principles of Pancasila, as the moral and philosophical foundation for the Indonesian state, can be harmonized with the politics of Collaborative Governance in the context of sustainable waste management. It provides valuable insights into the role of Pancasila in sustainable policy-making and practice and provides a foundation for the improvement of sustainable waste management policies in Padang City.

2 Method

2.1 Research Design

This study employs a qualitative research design with a descriptive phenomenological approach, as developed by Edmund Husserl, to explore the harmonization of Pancasila principles and Collaborative Governance politics in sustainable waste management in Padang. The descriptive phenomenology approach is chosen because it focuses on understanding the lived experiences of stakeholders involved in waste management governance, particularly in harmonizing Pancasila principles with Collaborative Governance [25].

Through phenomenological reduction (*epoché*), the study seeks to uncover the essence of stakeholders' perceptions regarding government collaboration, community participation, and sustainable waste practices. The study focuses on describing and interpreting stakeholders' experiences by collecting qualitative data from literature analysis and document reviews. The research also involves an in-depth examination of legal frameworks, policies, and scholarly discussions on sustainable waste management in Indonesia.

Table 2. TPS data in Padang City

No.	Name of Polling Station	No.	Name of Polling Station
1	Polling Station Behind the Police Station	64	Governor's Office polling station
2	Simpang Kalumpang TPS	65	Korem polling station
3	Pasia Nan Tigo TPS	66	TPS BPD / Bank Nagari
4	TPS Bungo Pasang	67	TPS Parak Pisang
5	TPS Simpang Damri/Stasiun Tabing	68	TPS Behind Junior High School 30
6	Linggar Jati TPS	69	JBT Marapalam TPS (Above)
7	Anak Aia polling station	70	TPS under JBT Tamsis
8	KPIK TPS	71	Andalas Bridge TPS
9	TVRI POLLING STATION	72	TPS Behind SD Andalas
10	Haji Dormitory polling station	73	TPS Jln. Jati 2
11	City Hall TPS	74	TPS Simp. Rumah Potong/Jln. Jati
12	Nuance Housing TPS	75	TPS Jln. Situjuh
13	Mega Permai TPS	76	Matador Field
14	Padang Sarai TPS	77	TPS Jln. Jati 4
15	TPS SMA 8/SDN 56 Anak Aia	78	Ganting Washing Station
16	TPS Tanjung Aur/Simp. Lumin Islamic Boarding School	79	TPS Bank Indonesia
17	Anak Aia Housing TPS	80	PJKA TPS Simp. Haru
18	TG POLLING STATION. Black	81	TPS M. Djamil Hospital
19	UBH Campus TPS By Pass	82	TPS Puskesmas Seberang Padang
20	Siti Rahmah Hospital polling station	83	TPS Seberang Palinggam
21	Anak Aie polling station	84	Rawang Jundul/Villa Mega Housing TPS
22	Transito TPS	85	Bgd. Aziz Chan
23	Polonia polling station	86	TPS Jirak Cendana Mata Air
24	Seranti polling station	87	Gaung Market TPS
25	Patenggangan TPS	89	TPS Pemancungan
26	Tamsis TPS	90	TPS in front of SD 41 Seberang Padang
27	TPS Alai Parak Kopi	91	Rawang polling station near Rawang BB
28	Gunung Pangilun / Gajah Mada TPS	92	TPS Front of Batang Arau Field / Pabayan Roundabout
29	TPS UKU/Bahari	93	TPS Seberang Padang
30	TPS Johor/Asratek	94	Air Manis Beach TPS
31	TPS Jl. Paus	95	Pelindo Teluk Bayur TPS
32	TPS Jl. Todak	96	TPS Lapai
33	Dipo ATB	97	Siteba Bridge TPS
34	Tamsis PU Office TPS	98	TPS Simp. Berok Siteba / City Forest
35	TPS Khatib Sulaiman PU Office	100	TPS SMA 12
36	TPS Khatib Court Office	101	Lubuk Lintah TPS
37	TPS SMA 3 (Inside)	102	IAIN Lubuk Lintah polling station
38	TPS UBH Khatib Sulaiman	103	TPS Anduring/Sarang Crow/Parak Jigarang
39	Meatball TPS	104	Perumas Belimbing TPS
40	Transmart TPS	105	Polling Station Near the Mosque of Truth
41	UNP TPS (Inside)	106	TPS Baznas
42	UNP polling station (outside)	107	HOSPITAL
43	Provincial DPRS polling stations	108	TPS Kel. Terantang Beringin
44	UBH Ulak Karang Campus TPS	109	TPS Bandar Buat/Simp. Gaduik
45	TPS SMA 1 (Inside)	110	Lemdadika TPS Padang Besi
46	131st Battalion polling station	111	TPS Atok Genteng Indarung
47	Falamboyan polling station	112	Sako/Indarung TPS
48	Muaro Lasak Parking Lot TPS	113	Indarung Housing TPS
49	Lake Cimpago Beach parking lot	114	TPS Simpang Arai Pinang
50	Cimpago Lake TPS	115	Dipo Pengambiran
51	Padang Beach TPS / Alhakim Mosque	116	TPS Gates
52	TPS Jl. Ujung Gurung	117	TPS Ujung Tanah
53	Pasar Pagi TPS	118	TPS Limau Manis Selatan/Gaduik
54	TPS Rimbo Tapi Banda	119	Kapalo Koto TPS
55	Ratulangi TPS	120	TPS BKD / Jln. M. Hatta
56	TPS Kampung Jao	121	TPS Rumah Sakit Unand Limau Manis
57	TPS Wowo/Veteran	122	TPS Kampus Poli Unand LM. Sweet
58	TPS SMA 2 (Inside)	123	TPS Sendik BRI
59	TPS Plaza Andalas	124	Parak Nipah Bungus
60	TPS Behind Tangsi/Museum Aditiawarman	125	Telik Kabung Barat
61	TPS Hotel Bumi Minang	126	Bungus Harbor
62	TPS LP Muaro (Inside)	127	Teluk Sirih power plant

Source: Decree of Mayor of Padang Number 227 of 221

To ensure a structured and rigorous interpretation, the findings are analyzed using Colaizzi's method of phenomenological analysis, which consists of seven steps: reading and re-reading textual data; extracting significant statements; formulating meanings; clustering themes; developing an exhaustive description; identifying the fundamental structure, and validating findings through a literature cross-check. This approach allows for a deeper exploration of how stakeholders experience, interpret, and engage with waste governance policies, ensuring that the study captures the subjective realities and challenges of collaborative waste management in Padang.

2.2 Study Scope and Participants

The research primarily examines government policies and governance practices in waste management within Padang City. The study does not involve direct interaction with human subjects but relies on an extensive review of documents, including local regulations, national policies, scholarly articles, and government reports. Key sources of data include:

- Local Regulations: Reviewing city-level policies and ordinances related to waste management and Collaborative Governance.
- National Policies: Analyzing laws and government regulations that frame waste management strategies in Indonesia.
- Previous Studies: Examining academic research on waste management governance and Pancasila principles.
- Institutional Reports: Evaluating reports from government agencies, environmental organizations, and policy think tanks.

The selection of these sources is based on their relevance to understanding the intersection between Pancasila values and Collaborative Governance in managing waste. The study aims to build a comprehensive picture of how policies are developed, implemented, and aligned with national ideological principles.

2.3 Data Collection

This research relies on secondary data collection methods through an extensive literature review. Data obtained from peer-reviewed articles, official government publications, and legal documents. The following data collection techniques are applied:

- Document Analysis: Reviewing legal documents such as Regional Regulations, Government Regulations, and Laws that regulate waste management and governance collaboration.
- Content Analysis: Examining scholarly articles, conference papers, and reports to identify key themes and insights into Pancasila-based governance practices.
- Comparative Analysis: Comparing waste management governance models in different regions to contextualize the findings within Padang City.

The document and content analysis techniques help identify patterns, contradictions, and gaps in current waste management governance policies. By systematically analyzing textual data, the research aims to uncover implicit and explicit relationships between governance structures and Pancasila principles.

2.4 Data Analysis

The collected data is analyzed using a descriptive qualitative approach. The analysis process follows the interactive model proposed by Miles and Huberman, which consists of the following stages:

- Data Reduction: selecting, focusing and simplifying data to ensure clarity in analyzing Collaborative Governance and Pancasila principles.
- Data Display: organizing findings into thematic categories to highlight governance strategies, stakeholder roles, and ideological alignments.
- Conclusion drawing and verification: Interpreting the findings to derive meaningful insights and verifying them against existing theories and frameworks in governance and sustainable waste management.

The study also employs thematic analysis to categorize and interpret findings systematically. The themes are derived based on governance frameworks, legal provisions, and conceptual models of sustainability. The expected outcome of the data analysis is to provide a structured understanding of how Pancasila principles are integrated into waste management policies and the effectiveness of Collaborative Governance in achieving sustainability goals. By synthesizing findings from multiple sources, the study contributes to developing governance strategies that align with national ideological values and promote sustainable waste management solutions in Padang City.

3 Result

The waste problem in Padang City requires good and sustainable collaboration to analyze the collaboration process, researchers will use the Collaborative Governance Theory by Morse & Stephens which starts from stages such as assessment, initiation, deliberation, and implementation [26].

3.1 Assessment Stage

The data on the significant amount of waste accumulated in Padang City between 2019-2022 is highly relevant to the Assessment stage of the Collaborative Governance process [20]. In the Assessment stage, an initial evaluation is carried out to gain a comprehensive understanding of the waste problem in Padang City. The sharp rise in waste volume, as indicated by the data, highlights the growing severity of the issue and serves as a crucial reference for analyzing its environmental and social impacts.

This increase underscores the need for collective awareness among stakeholders, including the government, local communities, and the private sector, to assess the broader consequences of waste accumulation. A thorough understanding at this stage lays the groundwork for developing more effective policies and strategic interventions to mitigate the problem.

Furthermore, data showing that excessive waste buildup can disrupt environmental quality, heighten pollution risks, and contribute to flooding further emphasizes the urgency of this stage. These findings prompt stakeholders to focus on identifying the root causes and devising more sustainable waste management strategies. Within the framework of Collaborative Governance, this data-driven assessment serves as a pivotal foundation for coordinated efforts to tackle the escalating waste crisis in Padang City.

3.2 Initiation Stage

The Initiation stage in the Collaborative Governance process refers to the initial steps taken by the government and related parties to design and start the implementation of waste management programs or initiatives [27]. In Padang City, the government's efforts in managing waste have included several important steps at the initiation stage.

One of the efforts made by the Padang City Government is the initiation of the waste bank program [28]. This program began in 2012 and received a significant boost after the issuance of Padang Mayor Regulation (Perwako) Number 44 of 2018 concerning Regional Policies and Strategies in the management of household waste and similar household waste. The waste bank program aims to empower the community in waste management with an efficient waste collection, sorting and processing system. However, the effectiveness of the Waste Bank Program varies.

Data from the Padang City Environmental Agency shows that while the program has led to a 76% increase in waste bank participation from 2019 to 2023, challenges remain in ensuring long-term sustainability [29]. Many communities still lack access to proper waste segregation facilities, limiting the program's overall impact. This program is also expected to reduce the volume of waste entering the landfill and encourage management based on the 3R principles (Reduce, Reuse, Recycle).

However, while initiatives such as the waste bank program have been initiated, it should be noted that in this study, the results show that the program is still not running effectively. This is due to a number of factors, including the lack of technical guidance and suboptimal implementation. In addition, the "One Village One Waste Bank" program initiated since 2019 has also not yet reached half of the total number of villages in Padang City, indicating that there are obstacles in the initiation stage that still need to be addressed [30].

The Initiation Phase also involves efforts to engage the community in waste management. Beyond implementing the waste bank program, the city government has taken steps to increase public awareness of the importance of sustainable waste management. However, several challenges remain, including the persistence of illegal dumping sites that need to be addressed and the relatively low level of community participation in existing waste management programs.

Within the framework of Collaborative Governance, the Initiation Phase in Padang City reflects ongoing efforts to tackle waste-related issues through various programs. Despite these initiatives, findings suggest that further improvements are needed to enhance their effectiveness and ensure that sustainable waste management practices can be implemented more successfully.

3.3 Deliberation Stage

The Deliberation stage in the Collaborative Governance process involves in-depth understanding and discussion between the government, the community, and related parties regarding waste management strategies and policies [31]. In the context of waste management in Padang City, the Deliberation stage plays a crucial role in determining the effectiveness of collaboration between the government and the community. However, research findings indicate that this collaboration has not yet reached its full potential.

During this stage, discussions, joint planning, and decision-making among various stakeholders should take place to establish a shared vision and common goals for sustainable waste management. However, the findings suggest that these processes have not been effectively implemented, and challenges remain in fostering collaboration between the government and the community.

One key issue identified is the lack of proactive engagement in the deliberation phase. Opportunities for dialogue and constructive idea-sharing between the government and the community have not been fully maximized. In some

instances, community members feel excluded from decision-making processes related to waste management, which in turn affects the effectiveness of planned and implemented strategies.

From the perspective of Collaborative Governance, shortcomings in the deliberation stage can hinder the achievement of consensus and coordinated action in addressing waste-related challenges. Strengthening collaboration between the government and the community at this stage is essential to developing more effective policies and strategies. This requires increasing community involvement in decision-making and fostering a stronger collective commitment to sustainable waste management. By improving this process, Collaborative Governance efforts can yield more targeted and impactful solutions for managing waste in Padang City.

3.4 Implementation Stage

The Implementation stage in the Collaborative Governance process in Padang City reflects an effort to apply the principles of Pancasila, especially in the context of waste management [32]. The principles of Pancasila such as social justice, cooperation, and the welfare of the people should serve as the moral compass guiding the implementation of waste management programs. Social justice, for instance, should be reflected in efforts to ensure that both the benefits and responsibilities of waste management are distributed fairly, allowing all members of society equal opportunities to participate. However, challenges remain in achieving an equitable waste management system. Data from the Padang City Environmental Agency in 2023 shows that while waste collection services are more accessible in urban areas, many peripheral communities still struggle with irregular waste disposal services, leading to disparities in waste management outcomes. To address this issue, stronger collaboration between the government, community, and private sector is necessary to ensure more inclusive waste management policies.

Moreover, the implementation phase should embody the principle of strong cooperation among various stakeholders. Effective waste management relies on the synergy between government institutions, local communities, and private entities. The success of the Waste Bank Program in several districts of Padang, which has managed to recycle over 120 tons of waste annually, demonstrates the potential of collaborative efforts. However, data from the Padang City Environmental Agency in 2023 indicates that participation in the Waste Bank Program remains limited, with only 30 waste banks operating across 103 villages. This shows that the 'One Village One Waste Bank' initiative launched in 2019 has not yet achieved half of its target.

Additionally, the implementation phase should significantly contribute to improving the welfare of Padang City's residents. A well-managed and sustainable waste system can enhance public well-being by minimizing environmental risks and generating long-term benefits. Cases of flooding linked to clogged drainage systems due to unmanaged waste, such as the incidents in Seberang Padang in late 2023, highlight the urgent need for improved waste management practices. However, the lack of fully optimized collaboration continues to hinder progress. Strengthening cooperation among key stakeholders in this phase is therefore essential to ensuring that waste management aligns more closely with the principles of Pancasila and delivers maximum benefits for the people of Padang City.

4 Discussion

4.1 Implementation of Pancasila Principles

The application of Pancasila principles in waste management in Padang City demonstrates efforts to ensure these values are reflected in policies and programs. One key principle, social justice, is evident in initiatives such as the waste bank program. This program enables communities to take an active role in waste management by collecting, sorting, and recycling waste. In addition to reducing environmental impact, it provides economic benefits, helping residents generate additional income and improve their livelihoods.

However, challenges persist in fully implementing Pancasila values in waste management. One of the main obstacles is the need for better coordination between the government, community, and private sector. Effective waste management requires stronger collaboration to ensure that all stakeholders play a role in making the system more inclusive and just. Without proper coordination, the integration of Pancasila values may not be maximized in practice.

A long-term and comprehensive approach is also essential in applying Pancasila principles to waste management. Addressing waste issues effectively requires a clear understanding of how these values can shape practical solutions. Continuous improvements in policies and implementation strategies are necessary to enhance the impact of waste management efforts. Strengthening these approaches will help Padang City align its waste management system with Pancasila values while supporting environmental and social sustainability.

4.2 The political Role of Collaborative Governance

The role of Collaborative Governance in waste management in Padang City highlights the necessity of synergy between the government, community, and private sector in decision-making and program implementation. Research findings indicate that this collaboration has become a fundamental pillar in addressing the escalating waste problem.

The governance process involves several stages, including assessment, initiation, deliberation, and implementation, each requiring the active participation of various stakeholders.

Through this collaborative approach, communities and private entities are not merely passive recipients of government policies but are actively engaged in formulating and executing waste management programs. For instance, the Waste Bank Program, which has been implemented in several districts, enables residents to exchange recyclable waste for financial incentives. Data from the Environmental Agency of Padang City (DLH Padang) shows that in 2023, the Waste Bank Program successfully managed over 120 tons of recyclable waste, reducing the burden on local landfills and increasing community awareness about waste separation.

The government, as a key facilitator, plays an essential role in fostering collaboration. Policies such as the “Zero Waste” campaign and mandatory waste sorting regulations have been introduced to encourage more active participation from both residents and businesses. Despite these efforts, public awareness remains a challenge. A 2023 survey by BPS Sumbar found that only 55% of Padang’s households actively separate their waste, and participation in waste sorting programs is significantly lower in low-income communities. This indicates a need for stronger education and incentive programs to increase citizen involvement. However, despite these efforts, challenges persist. Coordination gaps among stakeholders, conflicting interests, and resource limitations remain significant hurdles. A report from the Ministry of Environment and Forestry (KLHK) in 2023 highlighted that nearly 40% of waste in Padang City remains unmanaged properly, underscoring the need for stronger cooperation and enforcement mechanisms.

Given these challenges, further steps must be taken to enhance the effectiveness of Collaborative Governance in waste management. Strengthening institutional coordination, ensuring transparency in decision-making, and increasing funding for community-driven initiatives are essential strategies. Moreover, Collaborative Governance plays a vital role in achieving sustainable development goals (SDGs), particularly in promoting responsible consumption and production (SDG 12) and sustainable cities and communities (SDG 11). A well-structured and inclusive approach to waste management will not only improve environmental conditions but also foster long-term community engagement and economic benefits for Padang City.

4.3 Policy Implementation

The policy implications arising from the results of this research are very important in order to improve the efficiency and effectiveness of waste management in Padang City. The research results that reveal the integration of Pancasila principles in waste management practices and the politics of Collaborative Governance provide a number of valuable inputs for better policy decision-making. Here are some relevant policy implications: The findings of this research hold significant policy implications for improving the efficiency and effectiveness of waste management in Padang City. The integration of Pancasila principles into waste management and the implementation of Collaborative Governance provide crucial insights for more effective policy-making. Based on the research findings and relevant supporting data, the following policy recommendations are proposed:

4.3.1 Strengthening community empowerment

The application of Pancasila principles highlights the importance of community participation in waste management, particularly through programs like waste banks. According to data from DLH Padang in 2023, there are over 50 waste banks operating in the city, yet their impact remains suboptimal due to limited public awareness and engagement. To maximize their potential, policies should focus on expanding training programs, incentives, and education campaigns to encourage more active participation. The government should provide technical guidelines and financial support to facilitate waste segregation, recycling, and economic benefits for the community.

4.3.2 Enhancing multi-stakeholder collaboration

Another crucial policy implication is the need for stronger collaboration between the government, community, and private sector. A report from the Ministry of Environment and Forestry states that 40% of urban waste in Indonesia remains unmanaged due to poor coordination among stakeholders [33]. Policies should promote regular multi-stakeholder meetings, collaborative forums, and public-private partnerships to ensure effective decision-making and implementation. However, attempts to integrate public-private partnerships into waste management have faced regulatory and financial challenges. A 2021 attempt to establish a waste-to-energy plant in Padang failed due to unclear investment regulations and a lack of financial incentives for private investors. The establishment of local waste management task forces can facilitate more structured cooperation.

4.3.3 Development of clear guidelines and best practices

For waste management policies to be more aligned with Pancasila values, it is essential to develop comprehensive implementation guidelines. These guidelines should offer clear instructions on integrating social justice, environmental responsibility, and economic empowerment in waste management practices. Lessons from successful models, such as Surabaya’s waste-to-energy program, could be adapted to Padang City to ensure sustainability and effectiveness.

4.3.4 Strengthening coordination and resources allocation

Policy measures should also address the lack of coordination and financial resources in waste management programs. Research from BPS Sumbar in 2023 shows that only 65% of waste in Padang City is properly collected and processed, while the remaining 35% ends up in illegal dumpsites [34]. To address this issue, local policies must prioritize better coordination in waste collection, disposal, and recycling. Additionally, increased budget allocation for waste management infrastructure and incentives for private sector involvement can help bridge existing gaps.

These policy recommendations provide a strategic framework for improving waste management in Padang City. By emphasizing community empowerment, stronger collaboration, clearer guidelines, and improved resource allocation, policymakers can ensure a more sustainable and efficient waste management system. Implementing these measures will lead to a cleaner environment, enhanced public health, and improved quality of life for the residents of Padang City.

5 Conclusion

The findings of this study highlight the importance of aligning Pancasila principles with the politics of Collaborative Governance to achieve sustainable waste management in Padang City. Rapid population growth and the increasing volume of waste indicate that waste management must remain a priority agenda for the government. The integration of Pancasila values, particularly through community empowerment initiatives such as the waste bank program, serves as a strong moral foundation for improving waste management practices. Additionally, Collaborative Governance involving the government, communities, and the private sector plays a crucial role in decision-making and the implementation of waste management programs.

Although this study provides valuable insights, several limitations must be acknowledged. First, it primarily focuses on policy and governance aspects without exploring in depth the technical and economic feasibility of the proposed waste management solutions. Second, while the waste bank program has been identified as a key strategy for community empowerment, its long-term impact on waste reduction and economic well-being requires further evaluation using a quantitative approach. Furthermore, challenges in stakeholder coordination and resource allocation remain obstacles that have yet to be fully addressed, necessitating a more comprehensive analysis.

Given these limitations, future research should further investigate the long-term effects of the waste bank program on waste reduction and community welfare, as well as conduct comparative analyses with other cities that have successfully implemented sustainable waste management solutions. Additionally, further studies should explore innovative funding models for waste management, such as public-private partnerships and policy-based incentive schemes. Developing more specific policy recommendations based on in-depth interviews and case studies is also essential for improving waste governance in the future.

By addressing these aspects, this research can serve as a foundation for the development of more comprehensive policies. Continuous improvements in collaborative waste management governance are expected to create a cleaner, healthier, and more sustainable urban environment for the people of Padang City.

Authors Contribution

T.R.V. and R.E.P. initiated the core idea of this study. R.E.P. and T.H.P. worked on developing the theoretical framework and conducting the necessary calculations. T.R.V. and T.H.P. reviewed and validated the analytical methods applied in the research. Additionally, T.R.V. and T.H.P. provided oversight and guidance throughout the study. All authors were actively involved in discussing the findings and refining the final manuscript.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Acknowledgment

The authors would like to thank all those who have played a role in supporting and enabling this research. Thank you to the Padang Government and the Padang Environment Agency for providing access to data and valuable cooperation in gathering important information for this research. And thank you to the people of Padang for being willing to be case study subjects and sharing meaningful insights.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- [1] T. A. Kurniawan, C. Meidiana, M. H. Dzarfan Othman, H. H. Goh, and K. W. Chew, "Strengthening waste recycling industry in Malang (Indonesia): Lessons from waste management in the era of Industry 4.0," *J. Clean. Prod.*, vol. 382, p. 135296, 2023. <https://doi.org/10.1016/j.jclepro.2022.135296>

- [2] I. R. Abubakar, K. M. Maniruzzaman, U. L. Dano, F. S. AlShihri, M. S. AlShammari, S. M. S. Ahmed, W. A. G. Al-Gehlani, and T. I. Alrawaf, "Environmental sustainability impacts of solid waste management practices in the global south," *Int. J. Environ. Res. Public Health*, vol. 19, no. 19, p. 12717, 2022. <https://doi.org/10.3390/ijerph191912717>
- [3] G. Qian, C. Duanmu, N. Ali, A. Khan, S. Malik, Y. Yang, and M. Bilal, "Hazardous wastes, adverse impacts, and management strategies: A way forward to environmental sustainability," *Environ. Dev. Sustain.*, vol. 24, no. 8, pp. 9731–9756, 2022. <https://doi.org/10.1007/s10668-021-01867-2>
- [4] A. Siddiqua, J. N. Hahladakis, and W. A. K. A. Al-Attiya, "An overview of the environmental pollution and health effects associated with waste landfilling and open dumping," *Environ. Sci. Pollut. Res.*, vol. 29, no. 39, pp. 58 514–58 536, 2022. <https://doi.org/10.1007/s11356-022-21578-z>
- [5] D. P. Lozano Lazo, C. Bojanic Helbingen, and A. Gasparatos, "Household waste generation, composition and determining factors in rapidly urbanizing developing cities: Case study of Santa Cruz de la Sierra, Bolivia," *J. Mater. Cycles Waste Manag.*, vol. 25, no. 1, pp. 565–581, 2023. <https://doi.org/10.1007/s10163-022-01535-1>
- [6] N. Audia, R. E. Putera, D. Aromatica, and M. B. F. Bisri, "Capabilities of the city government in combating COVID-19 in the city of Padang," *E3S Web Conf.*, vol. 331, p. 01009, 2021. <https://doi.org/10.1051/e3sconf/202133101009>
- [7] Y. Rajagukguk, H. Wahyuningsih, and Y. Nabilah, "The effect of industrial waste on the water quality of Padang River in the industrial area of Tebing Tinggi," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 1122, p. 012072, 2021. <https://doi.org/10.1088/1757-899X/1122/1/012072>
- [8] H. Golwala, X. Zhang, S. M. Iskander, and A. L. Smith, "Solid waste: An overlooked source of microplastics to the environment," *Sci. Total Environ.*, vol. 769, p. 144581, 2021. <https://doi.org/10.1016/j.scitotenv.2020.144581>
- [9] S. O. Abioye and E. D. P. Perera, "Public health effects due to insufficient groundwater quality monitoring in Igando and Agbowo regions in Nigeria: A review," *Sustain. Water Resour. Manag.*, vol. 5, pp. 1711–1721, 2019. <https://doi.org/10.1007/s40899-019-00330-5>
- [10] H. M. Asih, "Participation of government, community, public sector, and mass media towards waste bank on recycling activity using regression analysis," *J. Adv. Res. Dyn. Control Syst.*, vol. 11, no. 12, pp. 186–192, 2019.
- [11] R. Fajria, R. E. Putera, and R. Ariany, "An evaluation of the implementation of the disaster resilient village program in Padang Pariaman regency," *E3S Web Conf.*, vol. 464, p. 10001, 2023. <https://doi.org/10.1051/e3sconf/202346410001>
- [12] L. Lahat and N. Sher-Hadar, "A threefold perspective: Conditions for collaborative governance," in *Collaborative Governance*, 2020, pp. 117–134. https://doi.org/10.1007/978-3-030-45807-2_4
- [13] R. A. Mulia, N. Saputra, S. Syamsir, and M. A. Embi, "Literature evaluation on optimizing supervisory functions in improving the performance of regional government bureaucracy," *Adabi J. Public Adm. Bus.*, vol. 11, no. 2, pp. 43–55, 2024. <https://doi.org/10.62066/jpab.v9i2.22>
- [14] N. Saputra, R. E. Putera, and A. Zetra, "Innovative capacity building strategies for sustainable disaster risk management: A systematic review, conceptual framework, and future research directions," *E3S Web Conf.*, vol. 604, p. 03004, 2025. <https://doi.org/10.1051/e3sconf/202560403004>
- [15] C. Safitri, T. R. Valentina, and A. Wicaksono, "Forms of government collaboration at the local level in handling the COVID-19 disaster," *E3S Web Conf.*, vol. 331, p. 02003, 2021. <https://doi.org/10.1051/e3sconf/202133102003>
- [16] S. Syamsir, N. Saputra, and R. A. Mulia, "Leadership agility in a VUCA world: A systematic review, conceptual insights, and research directions," *Cogent Bus. Manag.*, vol. 12, no. 1, p. 2482022, 2025. <https://doi.org/10.1080/23311975.2025.2482022>
- [17] S. Raharjo, S. Wulandari, and S. Fitriani, "Waste bank system improvement for electronic waste recycling in indonesia: A case study of Padang City," in *IOP Conf. Ser.: Earth Environ. Sci.*, vol. 802, 2021, p. 012053. <https://doi.org/10.1088/1755-1315/802/1/012053>
- [18] A. Khan, M. Waris, S. Panigrahi, M. R. Sajid, and F. Rana, "Improving the performance of public sector infrastructure projects: Role of project governance and stakeholder management," *J. Manag. Eng.*, vol. 37, no. 2, p. 04021012, 2021. [https://doi.org/10.1061/\(ASCE\)ME.1943-5479.0000886](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000886)
- [19] A. T. Fathani, R. E. Putera, Asrinaldi, T. R. Valentina, D. Hariyati, D. Holidin, and Agustiyara, "A systematical review of tourism disaster management: Insights from Indonesian's journey," in *E3S Web Conf.*, vol. 464, 2023, p. 05002. <https://doi.org/10.1051/e3sconf/202346405002>
- [20] N. Azizah and U. F. Rizky, "Bank sampah berkah: Sumber pendapatan alternatif masyarakat di kelurahan Tugu Selatan, Kecamatan Koja, Jakarta Utara," *Indones. J. Public Adm.*, vol. 8, no. 1, pp. 1–11, 2022. <https://doi.org/10.52447/ijpa.v8i1.5613>
- [21] N. Rahmi and E. Ernawati, "Perilaku ibu rumah tangga dalam pengelolaan sampah di kecamatan Pauh, Padang,"

Jambura Geo Educ. J., vol. 2, no. 1, pp. 1–6, 2021. <https://doi.org/10.34312/jgej.v2i1.7153>

- [22] T. H. Purnama, R. E. Putera, and H. Koeswara, “Landslide disaster mitigation in Sawahlunto City,” *E3S Web Conf.*, vol. 604, p. 16001, 2025. <https://doi.org/10.1051/e3sconf/202560416001>
- [23] R. Dahar, F. Rahmi, N. S. P. Yanti, and K. S. Maharani, “Penggunaan aplikasi akuntansi bagi asosiasi bank sampah kota Padang,” *Proc. Konf. Nas. Pengab. Kepada Masyarakat dan CSR (PKM-CSR)*, vol. 6, pp. 1–8, 2023. <https://doi.org/10.37695/pkmcsr.v6i0.2159>
- [24] P. F. Wialdi, R. E. Putera, K. Kusdarini, R. Ariany, T. R. Valentina, and R. Dermawan, “Local wisdom of coastal communities in mitigating earthquake disaster risk reduction,” *E3S Web Conf.*, vol. 331, p. 04001, 2021. <https://doi.org/10.1051/e3sconf/202133104001>
- [25] T. R. Valentina and R. E. Putera, “Towards the consolidation of local democracy in Indonesia: A historical approach of traditional Nagari in Minangkabau vs Colonial State,” *Thammasat Rev.*, vol. 28, no. 1, pp. 17–39, 2025.
- [26] I. Alim, A. Taufik, and N. Nurdin, “Collaborative governance through public service malls in Barru Regency: Assessment, initiation, deliberation, and implementation,” *J. Gov. Polit. Issues*, vol. 2, no. 3, pp. 167–174, 2022.
- [27] C. Wahyudin, A. Apriliani, F. T. Ramdani, G. Pratidina, and G. G. Seran, “A bibliometric analysis collaborative governance of plastic reduction through the transformation industry,” *J. Eng. Sci. Technol.*, vol. 18, no. 4, pp. 85–93, 2023.
- [28] N. Wahyuni, H. Fajri, N. Ulfah, and A. N. Barsei, “An overview of waste management strategies in Padang City: Current practices and challenges,” *IOP Conf. Ser. Earth Environ. Sci.*, vol. 1268, p. 012067, 2023. <https://doi.org/10.1088/1755-1315/1268/1/012067>
- [29] D. L. Hidup, “Tantangan dan solusi pengelolaan sampah di kabupaten buleleng,” 2024. <https://dlh.bulelengkab.go.id/informasi/detail/artikel/48.tantangan-dan-solusi-pengelolaan-sampah-di-kabupaten-buleleng>
- [30] B. Muchtar and A. Razak, “Economic growth poverty and degradation of environmental in Balai Gadang Village, Koto Tangah District, Padang City,” *IOP Conf. Ser. Earth Environ. Sci.*, vol. 314, p. 012059, 2019. <https://doi.org/10.1088/1755-1315/314/1/012059>
- [31] W. X. Song, E. Elahi, G. S. Hou, and P. M. Wang, “Collaborative governance for urban waste management: A case study using evolutionary game theory,” *Sustain. Cities Soc.*, vol. 126, p. 106380, 2025. <https://doi.org/10.1016/j.scs.2025.106380>
- [32] Z. Alhadi, O. Riandini, R. Yusran, F. Eriyanti, and R. E. Putera, “Policy design for strengthening disaster risk reduction based on Sendai Framework for Action in West Sumatera province, Indonesia,” *Int. J. Saf. Secur. Eng.*, vol. 14, no. 6, pp. 1895–1905, 2024. <https://doi.org/10.18280/ijssse.140623>
- [33] H. Kamaruddin, F. Patittingi, H. Assidiq, S. N. Bachril, and N. H. Al Mukarramah, “Legal aspect of plastic waste management in Indonesia and Malaysia: Addressing marine plastic debris,” *Sustainability*, vol. 14, no. 12, p. 6985, 2022. <https://doi.org/10.3390/su14126985>
- [34] R. D. Al Fariz, “Analysis of illegal waste disposal site situation through community engagement to enhance sustainable solid waste management in Indonesia,” 2024. <https://kitakyu.repo.nii.ac.jp/records/2000253>