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Integration of Participatory Rural Appraisal in Resolution of Waste Management Policy Problems in Pariaman City

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Abstract: *Urban waste management is often trapped in a linear economic approach and top-down policy implementation, triggering social conflict and policy gaps at the local level. This study aims to analyze waste management issues in Pariaman City, specifically at the South Tungkal Landfill, which operates as an open dumping site, and to model problem-solving through Participatory Rural Appraisal (PRA) interventions. Using qualitative methods with a case study design, data were collected through in-depth interviews, observations, Focus Group Discussions (FGDs), and PRA instruments with 46 purposive informants from the government, affected communities, and waste bank managers. The results of the study indicate that waste management policy implementation in Pariaman City falls within the symbolic implementation quadrant (high ambiguity, high conflict), characterized by weak enforcement and community resistance. Through the application of PRA techniques (transect walk, matrix ranking, and social mapping), participatory mapping has proven effective in aligning priorities between the government and the community. This intervention shifts the implementation model toward experimental implementation, which encourages collaborative governance. In conclusion, institutionalizing PRA within the regional policy cycle is an absolute prerequisite for reducing conflict and building adaptive waste management.*

Keywords: *Collaborative Governance, Policy Implementation, Participatory Rural Appraisal, Waste Management, Policy Gap*

INTRODUCTION

The urban waste management crisis can no longer be viewed as a local anomaly, but rather as a manifestation of the structural failure of the global environmental governance system, which still relies on a linear economic approach. Projections released by the United Nations Environment Programme (UNEP) in its Global Waste Management Outlook 2024 report warn that global urban solid waste production will experience an exponential escalation from 2.1 billion tons in 2023 to 3.8 billion tons in 2050. This indicates a structural crisis that cannot be resolved simply by expanding landfill capacity. The collect-transport-dispose model has been empirically proven to trigger capacity saturation, acute ecological pollution, and escalating public health risks.

In Indonesia, the formal policy response to this crisis has been realized through the National Waste Management Policy and Strategy (Jakstranas), mandated in Presidential Regulation Number 97 of 2017. This policy sets an ambitious target of 30% waste reduction and 70% waste management by 2025. Normatively, this instrument marks the country's commitment to transitioning to a circular economy. However, data from the National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry (KLHK) shows that implementation at the regional level remains stagnant, confirming the existence of a massive policy gap between policy design at the central level and operational realities at the grassroots level.

The problem of landfill management, which ignores sanitary landfill standards, is a reflection of the failure of environmental policy implementation in Indonesia, which has been empirically critically accumulated in Pariaman City. Data from the Strategic Environmental Assessment (KLHS) and the 2025 Pariaman City Regional Medium-Term Development Plan show that Pariaman City produces 41.53 tons of waste per day, generated by a population of 103,835.

Of this volume, the absolute burden is concentrated at the Tungkal Selatan Landfill, with a transported waste rate of 28.80 tons per day, while 7.93 tons per day (19.10%) remains unmanaged and has the potential to directly pollute the ecosystem.

According to the 2025 Government Agency Performance Accountability Report (LAKIP) of the Pariaman City Public Housing, Settlement Areas, and Environment Agency (PerkimLH), the Tungkal Selatan Landfill operates with an extreme infrastructure deficit. With a total land area of 2.35 hectares and a landfill zone of 1.8 hectares, this landfill operates without a geomembrane, a leachate treatment plant (a dysfunctional biopond), and a methane gas capture system. This situation demonstrates that the waste management system in Pariaman City still relies on open dumping, a primitive practice explicitly prohibited by Article 44 paragraph (2) of Law Number 18 of 2008 concerning Waste Management.

Pariaman City already has a regulatory framework in the form of Regional Regulation No. 11 of 2013 concerning Waste Management and Mayoral Circular No. 441 of 2025 concerning the Home Waste Sorting and Processing Movement. These policies normatively require integrated waste management and active community participation. However, limited implementation capacity, budget deficits for Information Communication

Technology (ICT) and physical infrastructure maintenance, and a failure to disseminate information have resulted in this policy lacking operational binding power.

The logical consequence of this implementation failure is the emergence of administrative sanctions and open social resistance. The Pariaman City Government has received coercive sanctions from the Government through Decree (SK) of the Minister of Environment No. 361 of 2025, which requires the cessation of open dumping activities at the Tungkal Selatan Landfill within 180 days and the preparation of a closure plan document. Simultaneously, heavy equipment malfunction in October 2023 triggered an accumulation of waste at the landfill gate, emitting a pungent odor, attracting flies, and leaking thick black leachate into irrigation channels within a 250-meter radius. This resulted in an outbreak of social conflict, manifested in the blockade of access roads to the landfill by affected residents. This series of events demonstrates that the policy gap has mutated into a socio-ecological crisis.

Based on a comprehensive review of previous literature, most studies on urban waste management in Indonesia are trapped in administrative evaluations based on reductionist quantitative measures of community participation. Empirical studies on social conflict around landfills generally focus on actor mapping and fail to link conflict resolution to the transition of local government macro-policy implementation. Therefore, this research offers novelty by integrating the Participatory Rural Appraisal (PRA) instrument not merely as a participatory diagnostic tool for qualitative data collection, but also as a deliberative policy intervention mechanism (policy co-production) to bridge the local-level policy gap. PRA is positioned as a catalyst for shifting the policy implementation quadrant from symbolic implementation (high ambiguity, high conflict) to experimental implementation (high ambiguity, low conflict) in accordance with the Matland Implementation Model.

This study aims to analyze the anatomy of the policy implementation gap and the dynamics of socio-ecological conflict in waste management in Pariaman City, and formulate the effectiveness of the Participatory Rural Appraisal (PRA) approach as a participatory conflict resolution instrument to encourage collaborative governance in the operational transition of the South Tungkal Landfill.

METHOD

This research adopted a qualitative approach with a descriptive narrative case study design, complemented by

Participatory Rural Appraisal (PRA) intervention techniques. The qualitative approach was used not only to describe the phenomenon but also to deeply examine the anatomy of the conflict through process-tracing, involving social dynamics, power asymmetries, and the rationality of actors behind the implementation of waste management policies.

The research location focused on the Tungkal Selatan Final Processing Site (TPA) in Pariaman City. This location was determined purposively, based on the justification that the Tungkal Selatan TPA is one of the waste management facilities in Indonesia that has been subject to severe administrative sanctions in the form of a Government Order to Stop the Open Dumping System by the Ministry of Environment and Forestry (KLHK) through Decree No. 361 of 2025. This legal sanction, coupled with escalating conflict in the form of blocked access to the facility by residents, makes this location an appropriate location for a comprehensive investigation into the failure of city-level environmental policy implementation.

To achieve internal validity, this study recruited 46 informants through a rigorous purposive sampling technique. Informant selection was based on their level of strategic information mastery, managerial authority within the bureaucratic structure, and the severity of exposure to ecological impacts. To avoid representational bias, informants were categorized into levels representing policymakers, street-level bureaucrats, and impacted communities.

Data analysis in this research operationalizes Hybrid Thematic Analysis which combines a deductive approach using a-priori codes extracted from Matland and Ansell & Gash's theoretical constructions, as well as an inductive approach to accommodate research findings.

RESULT AND DISCUSSION

This study extracted empirical data from 46 cross-sectoral informants (government, legislative, waste bank managers, and affected communities) at the South Tungkal Landfill, Pariaman City. Data collection used qualitative instruments and Participatory Rural Appraisal (PRA) to dissect the anatomy of socio-ecological conflicts resulting from open dumping operations that led to the imposition of sanctions under the Decree of the Minister of Environment and Forestry No. 361/2025.

Matland's Ambiguity-Conflict Model

The policy implementation model conceptualized by Matland (1995) postulates that the success or failure of policy implementation is largely

determined by the interaction between the level of ambiguity and the level of conflict. Ambiguity in implementation is divided into goal ambiguity and means ambiguity. In the context of environmental governance, means ambiguity often arises due to unclear funding allocations, limited leachate treatment technology, and the lack of precise operational guidelines at the site level. On the other hand, the conflict dimension represents the level of conflicting interests between actors. Environmental policy is rife with conflict because it involves an unequal distribution of ecological burdens. Where local governments are mandated to clean up urban areas in aggregate, while residents within the landfill zone bear the negative externalities in absolute terms.

Matland synthesizes these two dimensions into four implementation typologies: (1) Administrative Implementation (Low Ambiguity - Low Conflict), which is highly dependent on resource availability; (2) Political Implementation (Low Ambiguity - High Conflict), which is determined by the distribution of power and negotiation; (3) Experimental Implementation (High Ambiguity - Low Conflict), which relies on participatory adaptability and local learning; and (4) Symbolic Implementation (High Ambiguity - High Conflict). In the Symbolic Implementation typology, policies are reduced to mere political symbols or the fulfillment of normative mandates without providing substantial empirical impact in the field. This study hypothesizes that the failure of Regional Regulation Number 11 of 2013 in Pariaman City is precisely in the Symbolic Implementation quadrant, where regulations are available but fail to be executed due to infrastructure ambiguity that clashes with high levels of social friction.

Collaborative Governance

As a framework for resolving the symbolic implementation impasse, this study adopts the Collaborative Governance framework developed by Ansell & Gash and further elaborated by Emerson & Nabatchi. Collaboration is understood not simply as top-down public consultation, but as a multi-actor decision-making process that is equal, asymmetrical, and based on consensus.

The fundamental elements of collaborative governance include four main determinants: First, Starting Conditions, which encompass the level of public trust in the government, the distribution of power, and the track record of past conflicts. The low trust of Pariaman City residents due to a series of unfulfilled promises of infrastructure improvements presents an existential challenge at this

stage. Second, Institutional Design, which represents the availability of regulatory structures and information transparency that guarantee the inclusion of all marginalized groups. Third, Facilitative Leadership, which focuses on the capacity of bureaucratic leadership to reduce tensions, mediate cross-relationships, and bridge the information asymmetry between bureaucratic technical language and the local experiences of residents. Fourth, the Collaborative Process, which is the core interaction of face-to-face dialogue, the formation of collective understanding, and a shared commitment to implementing transitional solutions.

Participatory Rural Appraisal

PRA evolved from Rapid Rural Appraisal (RRA) as a critique of the dominant and elitist nature of policy planners. PRA adopts the principles of learning from below, inclusive participation, non-dominant facilitation, and self-critical awareness on the part of bureaucratic facilitators.

In the context of solving public policy problems, PRA is operationalized as a deliberative conflict resolution instrument. The use of visual spatial techniques constructed directly by the community in the form of Transect Walks, Historical Timelines, Matrix Rankings, and Social Mapping serves as a knowledge co-production mechanism. Local communities' empirical knowledge regarding the duration of fly exposure, leachate seepage points, and pungent odor fluctuations is validated and transformed into valid spatial planning data. Through this visualization process, PRA restores the dignity of affected residents from being mere objects of suffering (passive recipients) to becoming subjects of planning (active planners), which can mechanically improve Starting Conditions within the framework of Collaborative Governance.

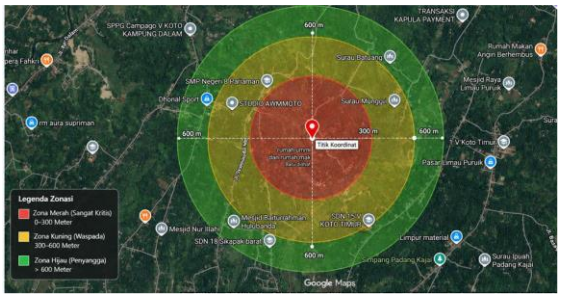
Participatory Rural Appraisal (PRA)-Based Data Analysis

This research resulted in data extraction that precisely maps the divergence of ecological priorities and exposures through five visual PRA techniques: (a) Transect Walk (Spatial Impact Mapping). The walkthrough validated three key ecological anomaly points disrupting civic space, including: (1) Point Zero: Mixed waste piles overflowing the gate due to a heavy equipment crisis, triggering fly infestation and extreme stench in domestic spaces; (2) Contamination Zone: Infiltration of concentrated leachate (black water) breaching village drainage ditches within a 250-meter radius; (3) Irrigation Risk Point: Visual and chemical degradation of rice

field irrigation channels within a <500-meter radius, threatening the agrarian resilience of residents.

Image of Leachate Flow Conditions from the South Tungkal Landfill

(b) Historical Timeline (Conflict Reconstruction) The conflict peaked after a total heavy equipment malfunction in October 2023, which paralyzed waste management services for two weeks. This incident destroyed remaining public trust, transformed passive complaints into physical road blockades by residents, and reached its peak legitimacy with the issuance of sanctions by the Ministry of Environment and Forestry in 2025. (c) Matrix Ranking (Priority Divergence) There was a sharp cognitive dissonance between the state and the community (score range 1-5). Residents prioritized resolving Odor & Fly Exposure (Score: 5) and Social Compensation (Score: 4), while the Government reduced these to secondary issues and prioritized the Availability of Heavy Equipment (Score: 5) as the core issue. (d) Social Mapping (Ecological Vulnerability Zoning) The fiction of administrative buffer zone boundaries is canceled by a social map that delineates the area into three clusters: Red Zone (0-300m: chronic carcinogenic exposure, fatal leachate, epicenter of resistance), Yellow Zone (300-600m: fluctuating exposure, reactive), and Green Zone (>600m: stable buffer area, potential for a Waste Bank center).



Socio-Ecological Vulnerability Zoning Based on Social Mapping

Focus Group Discussion (Participatory Resolution) The FGD used PRA data to force a compromise. The tripartite consensus resulted in three layers of mitigation: (1) Emergency (vector fogging, daily excavation); (2) Supply chain intervention (SOP for closed truck beds to respect waste bank sorting); and (3) Structural (Roadmap to stop open dumping in accordance with central regulations).

The results yielded three crucial findings: (1) Hegemonic Policy Gap: The failure of waste management stems from an extreme gap between normative regulations (Regional Regulation No. 11/2013) and the paralysis of bureaucratic

implementation capacity at the grassroots level. (2) Cognitive Dissonance: There is a conflict of problem definitions; the bureaucracy is oriented toward mechanical capital (heavy equipment), while the community demands bio-ecological protection (sanitation from flies and odors). (3) The Paradox of Sorting Disincentives: Low participation in Waste Banks is not due to apathy, but rather a rational response from residents to a bureaucratic logistics system that continues to remix sorted waste in the collection fleet.

Policy Implementation as Symbolic Implementation

Based on the Ambiguity-Conflict Model of Policy Implementation (Matland, 1995), Pariaman City's waste management policy prior to the PRA intervention was firmly locked in the Symbolic Implementation quadrant. This pathological quadrant resulted from the clash between high ambiguity in facilities (High Ambiguity—budget deficit, lack of geomembranes, dysfunctional bioponds) and mounting social resistance (High Conflict—road blockades due to fly and leachate invasions). The state's failure to neutralize these externalities resulted in Regional Regulation No. 11/2013 functioning solely as administrative rhetoric without any executional capacity (delivery mechanism), resulting in sanctions from the Ministry of Environment and Forestry.

PRA and Restorative Collaborative Governance

The Symbolic Implementation impasse was resolved by operationalizing PRA as a deliberative conflict-resolution engineering instrument. Referring to the Collaborative Governance framework (Ansell & Gash, 2008), true collaboration requires restoring the Starting Conditions (equilibrium of power and trust). The use of PRA matrices and cartography scientifically validated residents' suffering, shifting their status from "sufferers" to "planning subjects" (active planners).

The bureaucratic recognition of the community's visual truth in the FGD successfully reduced conflict tensions. The PRA intervention engineered a theoretical quadrant shift in implementation: transforming the order from Symbolic Implementation to Experimental Implementation (High Ambiguity, Low Conflict). Although the ambiguity of means (limited regional budget for sanitary landfills) was not fully resolved, the easing of structural conflict opened up space for policy co-production, enabling a more conducive reactivation of the circular economy (Waste Bank).

CONCLUSION

The waste management issues at the South Tungkal Landfill in Pariaman City are a manifestation of the wide policy gap between regulatory mandates and the lack of basic infrastructure, which locks the region into the Symbolic Implementation quadrant. The integration of the Participatory Rural Appraisal (PRA) methodology has proven empirically and theoretically valid as a corrective tool. By prioritizing deliberative spatial engineering, PRA successfully synchronized cognitive dissonance between the government and citizens, improved the prerequisites for Starting Conditions, and stimulated the emergence of Collaborative Governance. This intervention effectively shifted the policy paradigm toward Experimental Implementation, reduced extreme social conflict, and laid the foundation for an operational transition toward eliminating the open dumping system. For sustainability, local governments are recommended to institutionalize PRA instruments in macro-urban spatial planning and revitalize Waste Bank institutions by enforcing precise SOPs for segregated logistics.

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