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Polycentric Collaborative Governance and Circular Economy in Urban Waste Systems: Public Value Co-Creation Through CSR–Community Partnerships in Surabaya, Indonesia

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Abstract

This study examines how polycentric collaborative governance enables the implementation of circular economy principles in urban waste management through a case analysis of the Bintang Mangrove Waste Bank (BSBM) in Surabaya, Indonesia. Using a qualitative design involving in-depth interviews, field observations, and document analysis, the research explores how government agencies, corporate social responsibility (CSR) actors, and community organizations coordinate within a multi-level governance system. The findings reveal that Surabaya's waste management system operates through interconnected decision centers that combine regulatory facilitation by the Environmental Agency (DLH), resource and capacity support from PT PLN's CSR initiatives, and community-led recycling practices. These interactions generate an adaptive governance network characterized by trust, shared learning, and reciprocal resource flows. The collaboration evolves through three phases—initiation, consolidation, and institutionalization—demonstrating increasing coordination, strengthened incentives, and deeper community ownership. The study also shows that CSR-backed waste banks expand circular economy outcomes by diverting waste from landfills, creating household economic value, and fostering behavioral change. Overall, the research provides empirical evidence that integrating polycentric and collaborative governance with circular economy frameworks creates a robust platform for public value co-creation and strengthens the sustainability of urban environmental management in emerging cities.

Keywords: Polycentric Governance; Collaborative Governance; Circular Economy; CSR Partnerships; Urban Waste Management..

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I. Introduction

Indonesia, a nation of over 270 million people, generates more than 60 million tons of waste each year (SIPSN KLHK, 2024). The surge in waste generation and the scarcity of landfill space have strained infrastructure capacity and tested the effectiveness of national environmental policies. These challenges demand governance innovations that are not solely government-centered but instead engage multiple centers of authority across sectors.

Amid these national challenges, Surabaya, Indonesia's second-largest city, has become an important urban laboratory for waste management. This city, home to more than three million residents, generates an average of 1,800 tons of waste per day (Dinas Lingkungan Hidup Kota Surabaya, 2025). Surabaya exhibits a clear configuration of polycentric governance: the Environmental Agency (DLH) sets policy direction, local sub-district offices (*kelurahan*) facilitate implementation, citizen communities manage hundreds of Waste Bank Units (BSUs), and corporations such as PT PLN support infrastructure through Corporate Social Responsibility (CSR) programs. This layered distribution of authority creates an interactive and adaptive decision-making network—the core essence of polycentric governance (Ostrom, 2017), (Carlisle et al., 2019).

Polycentric collaborative governance emphasizes the existence of multiple interconnected centers of decision-making operating across different levels (Ansell et al., 2008).

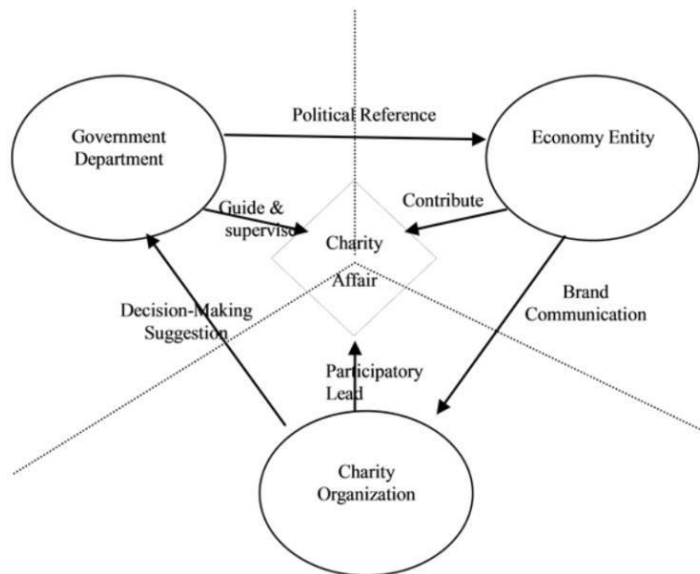


Figure 1. The polycentric governance model illustrates the interaction among government institutions, economic entities, and community organizations in the management of public affairs.

Source: (Wang, 2014).

The visualization in **Figure 1** presents three primary centers of decision-making: government institutions, economic entities, and community organizations. The government provides policy direction and oversight mechanisms, economic entities contribute resources and market-driven innovation, while community organizations lead

participation, provide feedback, and ensure accountability. These centers are connected through two-way coordination flows, indicating that no single actor holds dominant authority. The model demonstrates how public policy decisions and implementation emerge from continuous dialogue and mutual influence among these centers, creating a governance system that is adaptive, responsive, and resilient to the failure of any single actor (Wang, 2014).

Such a design facilitates horizontal coordination among communities and vertical integration with government institutions, thereby strengthening problem-solving capacity and policy legitimacy. Multi-stakeholder coordination also opens space for the co-creation of public value, where government, the private sector, and citizens collectively generate social and ecological benefits that would be unattainable in isolation (Bryson et al., 2017). The success of the Green Campus program, marked by high student participation, serves as evidence that active engagement accelerates the practice of sustainability (Eprilianto et al., 2022).

Meanwhile, the circular economy emerges as a strategic framework to curb the pace of urban waste generation. Rather than following a linear take–make–dispose pattern, the circular economy maximizes recycling and resource reuse, allowing the output of one process to become the input for another (Kirchherr et al., 2017). The 3R principles—reduce, reuse, and recycle—encourage behavioral change while simultaneously generating economic value from waste (Kirchherr et al., 2017). Surabaya translates these principles through its extensive **waste bank network**. The **Surabaya Central Waste Bank (BSIS)** partners with hundreds of local Waste Bank Units (BSUs) and targets the sale of **150 tons of dry waste per month** (Pemerintah Kota Surabaya, 2024). BSIS's performance has increased significantly, rising from **211.86 tons in 2016** to **442.88 tons in 2023** (Pemerintah Kota Surabaya, 2024). This increase underscores the role of waste banks as crucial nodes in urban waste reduction and as living laboratories of CSR-based polycentric governance.

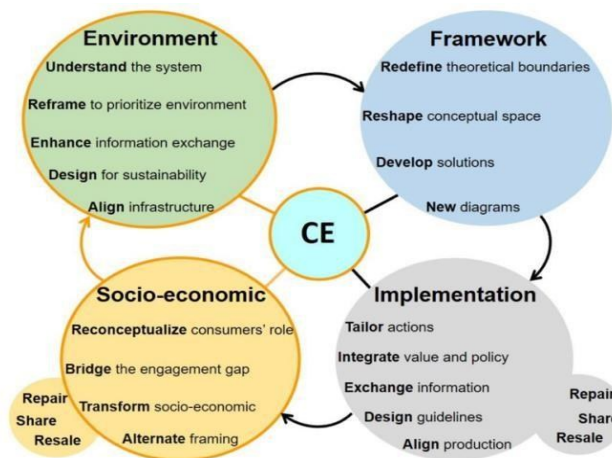


Figure 2. The integrative circular economy model highlights the environmental dimension, theoretical framework, implementation processes, and socio-economic aspects.

Source: (Kirchherr et al., 2017).

The visualization in **Figure 2** presents the **Butterfly Diagram** of the circular economy, which distinguishes two primary material flow pathways: the biological cycle and the technical cycle. The biological cycle illustrates the movement of organic materials—such as food waste and agricultural residues—that can return to the ecosystem through composting, anaerobic digestion, and nutrient regeneration, ensuring no harmful residues are produced. The technical cycle, on the other hand, demonstrates how inorganic materials—such as plastics, metals, and glass—are maintained within a closed loop through repair, reuse, remanufacturing, and recycling, thereby preserving material value and minimizing final waste.

These two pathways are interconnected through the principles of reduce, reuse, and recycle (3R), alongside energy recovery mechanisms that serve as a last resort when direct reuse is not feasible. The diagram emphasizes the role of public policy, technological innovation, and economic actor participation as key drivers ensuring that every material flow is redirected into its appropriate cycle. In the context of Surabaya, this model maps the position of waste banks within the technical cycle, where inorganic waste collected by residents does not end up in landfills but instead re-enters the production chain as raw materials. Thus, **Figure 2** reinforces the core logic of the circular economy: slowing and closing material flows through multi-stakeholder collaboration, which serves as the foundational framework of this study (Skene et al., 2024).

The combination of the circular economy model **and** polycentric governance framework forms the conceptual foundation of this study. The case of BSIS Surabaya provides empirical evidence of how polycentric collaborative governance strengthens the implementation of the circular economy and facilitates the co-creation of public value.

II. Methods

This study employed a **participatory qualitative scenario planning** approach to explore governance strategies for community empowerment in areas affected by the development of Kediri International Airport. The method combines *strategic foresight* and *participatory inquiry*, emphasizing collaborative learning among local stakeholders. Rather than relying on predictive models, this approach seeks to generate multiple plausible future scenarios that reflect different governance conditions and community responses.

This study employs a qualitative case study design to examine the dynamics of polycentric collaborative governance in implementing circular economy principles in urban waste management. Surabaya was chosen as the research site because it is recognized as a pioneer of community-based waste management in Indonesia, characterized by a broad network of waste banks and active private sector involvement through Corporate Social Responsibility (CSR) programs. The research focuses on CSR-based waste bank networks, with the Bintang Mangrove Waste Bank (BSBM) in Gunung Anyar Tambak serving as the primary case in partnership with PT PLN.

Informants were determined through purposive sampling, consisting of officials from the Surabaya Environmental Agency (DLH), waste bank managers, CSR representatives from PT PLN, and participating residents. Data were collected through in-depth interviews, field observations at waste bank locations, and document analysis of official reports, local regulations, and data from the National Waste Management Information System (SIPSN).

Data analysis followed a thematic approach, beginning with initial coding, categorization, and the identification of major themes. The analysis was guided by the frameworks of polycentric governance (Ostrom, 2017), (Carlisle et al., 2019) *collaborative governance* (Ansell & Gash, 2008). The validity of the research was ensured through source and method triangulation, as well as member checking with key informants. Ethical considerations were addressed by obtaining participants' informed consent prior to interviews and by maintaining the anonymity of respondent identities.

This study is limited to a single case context of a CSR-based waste bank in Surabaya, making its findings more contextual than broadly generalizable. Nevertheless, the case provides significant insights into how polycentric governance and circular economy principles can be integrated into urban waste management practices.

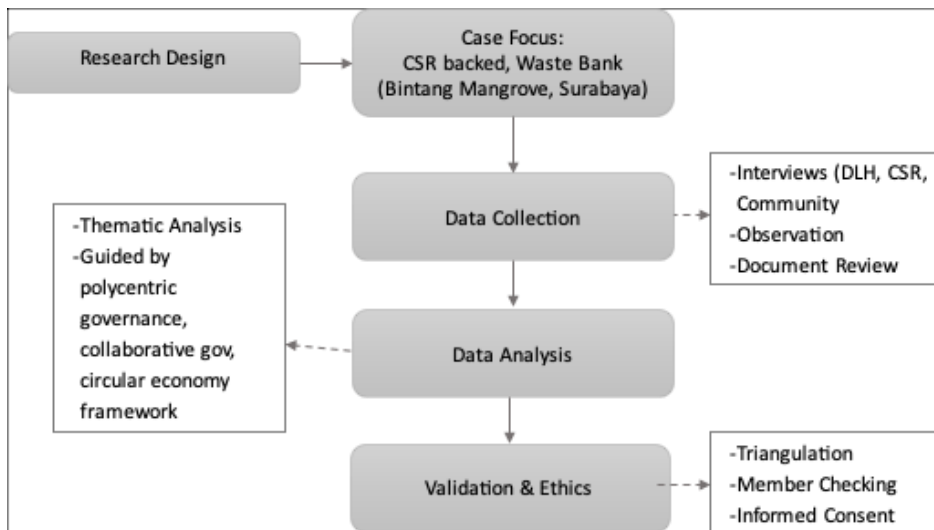


Figure 3. Research Method Flow

Source: Adapted from Creswell (2013; 2018), Yin (2018), Braun & Clarke (2006), and Lincoln & Guba (1985).

Figure 3 illustrates the methodological flow applied in this study. The research began with the establishment of a qualitative case study design, chosen for its ability to capture the complexity of multi-actor interactions within polycentric governance. The case focus was directed toward CSR-based waste banks in Surabaya, particularly the Bintang Mangrove Waste Bank located in Gunung Anyar Tambak, which represents a cross-sectoral collaborative practice. The subsequent stage involved data collection through three primary techniques: in-depth interviews with key actors (the Environmental Agency, waste bank managers, CSR representatives, and community participants), participatory observation at the waste bank site, and document analysis of policy papers and official reports, including data from the National Waste Management Information System (SIPSN). The collected data were then analyzed using a thematic approach guided by the frameworks of polycentric governance, collaborative governance, and the circular economy. The final stage consisted of validation through source and method triangulation, as well as member checking to ensure the credibility of findings, accompanied by adherence to ethical research principles through participant consent obtained prior to interviews.

III. Results, Analysis, and Discussions

Surabaya is recognized as one of the cities with the most extensive waste bank networks in Indonesia, with more than 650 active units spread across 31 districts. This initiative forms a crucial component of the city's strategy to reduce waste accumulation, which reaches several thousand tons per day. Among these numerous waste banks, the Bintang Mangrove Waste Bank (BSBM) in Gunung Anyar Tambak stands out for its successful integration of Corporate Social Responsibility (CSR) support from PT PLN with active participation from coastal communities. Since its establishment in 2012, BSBM has transformed from a simple waste deposit facility into a social innovation hub, with programs such as *saving through waste*, *paying electricity bills with waste*, and *river school*, designed to instill environmental awareness among younger generations.

The presence of BSBM has had a tangible impact on residents. The number of members increased from 59 to 256, total savings reached IDR 11.8 million, and approximately 1–2 tons of waste per month were diverted from landfills through local recycling mechanisms. For the managers, these achievements represent not just statistics but evidence of behavioral transformation. "In the past, we used to collect waste from the mangrove area by boat; now, residents are gradually becoming environmentally aware," said Mrs. Chusniyati, founder of BSBM. Her statement underscores how education and local leadership have successfully fostered community participation.

The role of PT PLN as a CSR partner is equally crucial. Beyond providing operational infrastructure, PLN supports innovation sustainability, including the unique program that allows residents to pay electricity bills through waste savings. One of the managers described its added value: "Here, waste can be used to pay for medical expenses, children's education, groceries, and even electricity." Meanwhile, the Environmental Agency (DLH) acts as a policy facilitator, although formal coordination remains limited due to the absence of a city-level CSR coordination forum (TJSL) that integrates various initiatives.

The strength of such collaboration can also be seen in other regions. The Putri Nyale Waste Bank in Mandalika, Central Lombok, for instance, has developed a gold-saving scheme supported by eight state-owned enterprises (BUMN). Within a year, the waste bank recruited 111 members and reduced nearly four tons of household waste. This comparison highlights that program success is determined not merely by the number of partners but by the consistency of support and clarity of incentives for residents.

With these achievements, the BSBM case demonstrates that the integration of CSR initiatives with local community movements can strengthen Surabaya's waste bank network. At the city scale, such contributions play a vital role in supporting waste reduction targets through the reduce, reuse, recycle (3R) strategy, while also proving that collaborative approaches can generate both environmental and social benefits simultaneously.

3.1. The Pattern of Polycentric Collaborative Governance

Empirically, the polycentric character of Surabaya's waste management system is evident through the interconnection of three levels of decision-making centers that interact adaptively. At the macro level, the Surabaya Environmental Agency (DLH) functions as a policy director, regulator, and provider of institutional legitimacy. At the meso level, PT PLN and the Surabaya Central Waste Bank (BSIS) serve as coordination hubs and resource

intermediaries, bridging government policy with community practices. At the micro level, the Bintang Mangrove Waste Bank (BSBM) and local communities initiate innovations and conduct recycling activities autonomously, according to their respective social and economic contexts. The pattern of interaction across these levels is non-hierarchical, forming an adaptive mechanism characteristic of polycentric governance, marked by two-way flows of resources and communication as well as flexible coordination among actors.

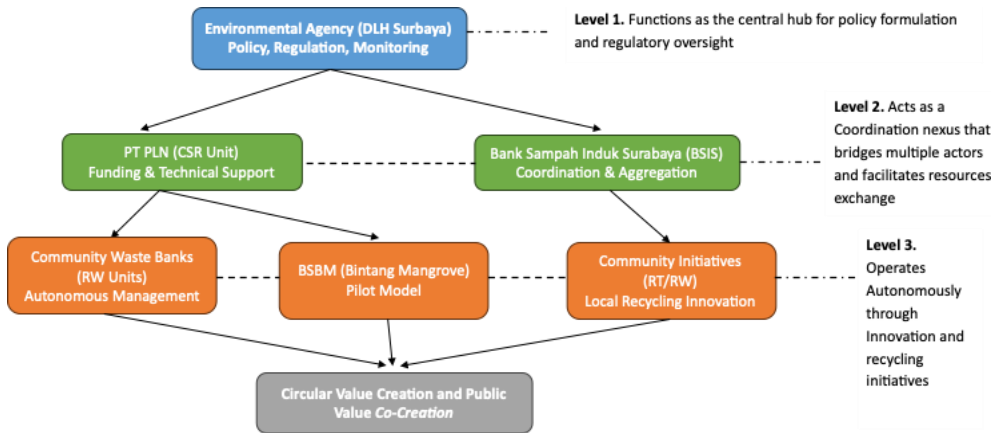


Figure 4. Empirical Model of Polycentric Governance in Surabaya’s Waste Management System.

Source: Developed based on empirical findings and Ostrom’s (2010) model of polycentric governance.

This figure visually depicts the functional relationships among the three levels of decision-making centers within Surabaya’s waste governance system. Level 1 (DLH Surabaya) functions as the policy and regulatory center; Level 2 (PT PLN–BSIS) acts as a coordination hub linking multiple actors and facilitating resource exchange; while Level 3 (BSBM and local communities) drives innovation and conducts recycling activities autonomously. The two-way arrows represent the flow of resources, communication, and reciprocal accountability, whereas the dotted lines indicate flexible and overlapping coordination—key characteristics of polycentric collaborative governance at the city level.

The findings of this study show that the management of the Bintang Mangrove Waste Bank (BSBM) in Surabaya constitutes a concrete manifestation of polycentric collaborative governance within the framework of the circular economy. The governance structure formed is not centralized within a single institution but consists of multiple decision nodes that interact dynamically. The Environmental Agency (DLH) functions as a policy facilitator and provider of strategic direction, PT PLN through its CSR program serves as a funding body and partner for social innovation, while the subdistrict government acts as an administrative intermediary between the community and the city government. The BSBM and coastal residents serve as the core of field implementation, where various resources and local knowledge are converted into new economic value through recycling activities.

This model illustrates that governance effectiveness does not solely depend on formal authority but rather on the ability of multiple decision centers to coordinate within an interdependent system. As McGinnis (2011) explains, polycentric systems enable diverse actors to manage public resources autonomously while maintaining mutual

oversight, allowing decisions to remain adaptive to local contexts (McGinnis, 2011). In the case of BSBM, coordination among CSR actors, the community, and the government operates on the principles of trust and voluntary agreement. One of the managers stated, *“We don’t wait for directives from above; instead, we help each other among waste banks because we share the same goal: reducing waste and creating added value.”* This statement aligns with the findings of Emerson et al. (2012), who argue that the success of public collaboration depends on processes of shared motivation and joint capacity building among actors.

Thematic analysis reveals that the interactions among actors within BSBM reflect three main dimensions: coordination and autonomy, trust and learning, and resource circulation. The first dimension emphasizes a polycentric structure that enables collaboration without hierarchy (McGinnis, 2011). The second dimension highlights the importance of trust-based interaction, as underscored by Koontz and Thomas (2012), in which trust functions as a form of social capital that fosters long-term commitment (Sakti et al., 2024). Meanwhile, the third dimension connects the flow of resources and economic incentives as evidence of circular economy practices, consistent with the systemic approach proposed by Geissdoerfer et al. (2017), which views circularity as an integrated process linking material recovery, innovation, and socio-institutional collaboration to achieve sustainable value creation (Geissdoerfer et al., 2017).

These three dimensions are illustrated in Figure 4, which depicts the integration of polycentric governance, collaborative governance, and circular economy theories within a single thematic framework. Each theme demonstrates the relationship between theory and empirical evidence—for example, trust and communication (between the community and BSBM), institutional facilitation (between DLH and local government units), resource sharing (between PT PLN and BSBM), and waste loop and incentive (between BSBM and residents). This visualization shows how environmental governance can evolve as an adaptive system that integrates institutional coordination, social collaboration, and local economic innovation.

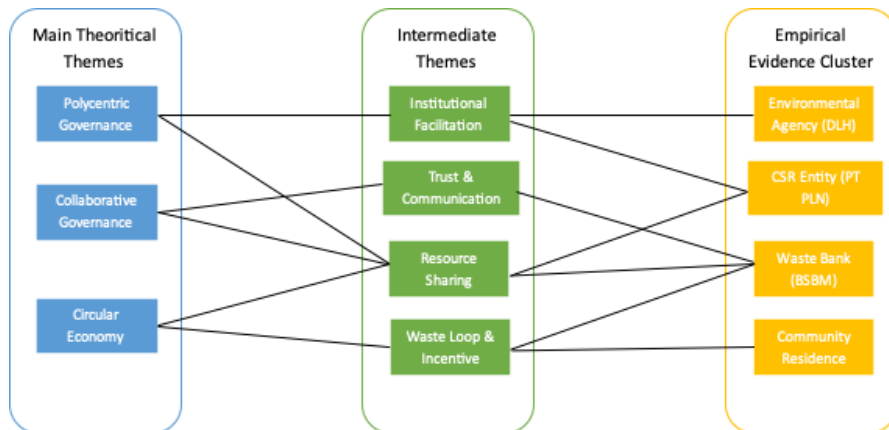


Figure 5. the integration of polycentric governance, collaborative governance, and circular economy theories within a single thematic framework

Source: Developed by the authors based on Ostrom’s polycentric governance framework (2010), Ansell & Gash’s collaborative governance model (2008), and circular economy theory (Geissdoerfer et al., 2017).

This pattern reinforces the argument that the sustainability of urban waste management is not merely a technical issue but the outcome of multi-actor interactions that collectively generate public value (*co-creation of public value*). Thus, the polycentric

The collaborative governance model in BSBM reflects a transition toward a more open, participatory, and resource-circular form of environmental governance.

This figure illustrates the thematic synthesis linking the theoretical framework, analytical themes derived from data, and empirical evidence from the field. The three columns represent the analytical hierarchy used in this research: Main Theoretical Themes, Intermediate Themes, and Clusters of Empirical Evidence. Each layer and connecting line between them demonstrate the process of integration between theory and practice—how theoretical concepts are operationalized in empirical contexts, and how field findings enrich understanding of governance and environmental sustainability theories.

The first column (Main Theoretical Themes) represents the conceptual foundations used in the analysis, namely Polycentric Governance, Collaborative Governance, and the Circular Economy. These serve as theoretical lenses for interpreting the dynamics of environmental governance involving multiple centers of decision-making (Ostrom, 2010), cross-actor collaboration built on trust and shared motivation (Emerson et al., 2012), and circular economic mechanisms that transform resource flows into new economic value within community systems (Geissdoerfer et al., 2017).

The second column (Intermediate Themes) presents the results of thematic categorization derived from the coding of interviews, observations, and document analysis. The four emerging themes—Institutional Facilitation, Trust & Communication, Resource Sharing, and Waste Loop & Incentive—reflect concrete mechanisms that bridge theory and practice. For instance, *Institutional Facilitation* illustrates the institutional support between the Environmental Agency (DLH) and subdistrict governments; *Trust & Communication* arises from trust-based interactions between waste bank managers and community members; *Resource Sharing* represents the flow of material and financial support from CSR partners; while *Waste Loop & Incentive* demonstrates how circular economy principles are implemented through incentives and community participation.

The third column (Clusters of Empirical Evidence) links the analytical findings to the real-world context. The four main actors—the Environmental Agency (DLH) as policy facilitator, the CSR entity (PT PLN) as resource provider, the Waste Bank (BSBM) as the operational hub, and the community residents as key participants—serve as empirical evidence reinforcing the interconnections among the themes. The horizontal lines connecting each layer depict the analytical logic of this research: theory (left column) forms the conceptual foundation for the themes (middle column), which are then substantiated by empirical evidence (right column). Each connecting line thus represents a process of conceptual translation—illustrating how theoretical principles are realized through collaborative behaviors and tangible outcomes within Surabaya's CSR-based waste management ecosystem.

This multilayered visualization demonstrates that polycentric collaborative governance and the circular economy are not separate domains but interdependent systems. Governance provides the structure for coordination, collaboration builds the social capital necessary for collective action, and circularity generates economic value from waste. Together, these elements form a complementary multi-level system in which theory,

themes, and practice interact iteratively through processes of learning and adaptation toward sustainable environmental governance.

3.2. Dynamics of Collaboration among CSR, Government, and Community within the Circular Economy

The study findings show that the collaboration between PT PLN as a CSR entity, the Environmental Agency (DLH) as a regulator, and the Bintang Mangrove Waste Bank (BSBM) as the implementing actor has created an adaptive and interdependent governance ecosystem. This form of collaboration is not transactional but rather a co-governance arrangement that enables each actor to contribute according to their respective capacities and interests. The CSR program of PT PLN does not merely provide material assistance but also functions as part of a social learning system that strengthens the institutional capacity of waste banks and surrounding communities. This aligns with Albareda et al. (2008), who argue that modern CSR programs have evolved from philanthropic initiatives toward networked governance, in which private sector actors participate in articulating public value alongside the state and the community (Albareda et al., 2008).

The Environmental Agency (DLH) plays a strategic role as both facilitator and mediator. Its primary function is not as a controller, but as an enabling institution that provides policy legitimacy, cross-actor coordination, and communicative spaces among government, businesses, and communities. This pattern reflects the logic of meta-governance, in which the government acts as a steering entity that ensures synergy without undermining local autonomy (Jessop, 2003).

An official from the Environmental Agency (DLH) explained, “We do not compel CSR initiatives to provide specific assistance, but we monitor their programs to ensure alignment with the city’s environmental objectives.” This mechanism demonstrates a balance between regulation and autonomy—a hallmark of a dynamic polycentric system (McGinnis, 2011).

From the community’s perspective, citizen participation—particularly among women and coastal youth—constitutes a crucial element in the success of the circular economy at the micro level. Activities such as waste sorting, weighing, and managing savings from recycled materials create new economic value while simultaneously strengthening environmental awareness. This phenomenon illustrates the concept of *co-production of public value* (Voorberg et al., 2015), where citizens are not merely beneficiaries but also producers of public value through everyday sustainability practices. The activities within BSBM not only generate economic value from waste but also foster a new collective identity as an environmentally conscious community.

The relationship among CSR initiatives, the government, and the community in this context is reciprocal. PLN gains social legitimacy and strengthens its sustainability image; the local government receives support in achieving waste reduction targets; and the community benefits economically while enhancing its social capacity. The three actors operate within a collaborative ecosystem sustained by trust, open communication, and mutual resource interdependence. Nevertheless, this collaborative dynamic is not without challenges. Barriers often arise from differing temporal orientations—short-term CSR objectives versus the community’s long-term sustainability goals—as well as from the limited availability of formal mechanisms to monitor collaborative outcomes. This phenomenon is referred to by Huxham and Vangen (2013) as *collaborative inertia*, a

condition in which collaboration occurs but yields suboptimal results due to disparities in capacity and incentives among actors (Huxham et al., 2013). Nevertheless, the CSR–government–community collaboration at BSBM demonstrates strong potential for advancing sustainable circular governance. CSR programs integrated into the waste bank system have been proven to generate value flows that extend beyond economic dimensions to include social and ecological benefits. By combining governmental legitimacy, the technical capacity of CSR actors, and citizen participation, this system exemplifies how the principles of polycentric collaborative governance can serve as a foundation for strengthening the circular economy at the urban level.

Table 1. Process-Based Interpretation of CSR–Government–Community Collaboration Dynamics in the Circular Economy Context

Collaboration Phase	Key Actors and Roles	Core Processes Observed	Implications for Circular Governance
Initiation	PT PLN (CSR) as initiator- DLH as facilitator- BSBM as initial beneficiary	Identification of local needs and waste potential- Initial training and awareness sessions- CSR commitment to community-based waste management	- Emergence of shared understanding and local ownership- CSR functions as an entry point for collaborative action
Consolidation	DLH as policy mediator- PLN and BSBM reinforce incentive system- Community expands participation	Strengthening communication and monitoring mechanisms- Implementation of waste banking and CSR-based incentive system- Expansion of inter-bank networks	- Development of trust and joint learning among actors- Polycentric and participatory governance patterns emerge
Institutionalization	DLH as policy driver- PLN as strategic partner- BSBM and community as co-producers of public value	Formalization of collaborative model within CSR reporting- Integration into Surabaya's environmental programs- Strengthening of community organization and educational outreach	- Co-creation of public value and sustainable circular economy practices

Source: Integration of literature and empirical findings (2025)

The table above illustrates that the dynamics of collaboration among CSR actors, the government, and the community within the circular economy context evolve through three main phases: initiation, consolidation, and institutionalization.

In the initiation phase, collaboration emerges from PT PLN's initial commitment to expand its social responsibility into the environmental sector, facilitated by the Environmental Agency (DLH) as the policy coordinator. Activities during this stage include preliminary training, identification of local needs, and public outreach on the importance of circular economy-based waste management. This phase results in a shared understanding of the socio-economic value embedded in waste management practices.

The consolidation phase marks the process of inter-actor adaptation. Collaboration ceases to be one-directional and transforms into a mutually reinforcing system. PLN takes on a strategic role in providing incentives and advanced training, while BSBM develops a more structured waste banking system. DLH acts as a policy mediator, ensuring alignment with regional regulations. At this stage, trust and joint learning processes begin to emerge, reflecting the establishment of polycentric governance in which decisions are made through coordination rather than hierarchy.

Meanwhile, the institutionalization phase signifies that the collaboration has become embedded in both policy and sustainable practice. The CSR-Community model is incorporated into PLN's sustainability reports and Surabaya's municipal environmental programs. BSBM's institutional framework is strengthened through educational networks and formal recognition from local governments. The public value generated extends beyond waste reduction to include social empowerment, enhanced community economic capacity, and behavioral transformation toward environmental responsibility.

Overall, these three phases demonstrate that cross-sector collaboration is not a linear process but an iterative learning journey integrating trust, communication, and resource exchange. By combining governmental legitimacy, corporate innovation, and community participation, this system exemplifies the practical application of polycentric collaborative governance that underpins the transition toward a circular economy at the local level.

IV. Conclusion and Recommendation

This study concludes that the CSR-based waste management system implemented through the Bank Sampah Bintang Mangrove (BSBM) in Surabaya exemplifies the practical application of the polycentric collaborative governance model within the framework of a circular economy. The collaboration among the Environmental Agency (DLH), PT PLN as the corporate actor, and local communities has formed a distributed and adaptive governance network that transcends conventional bureaucratic coordination patterns. At the empirical level, the findings indicate that the system operates through multiple decision centers interconnected by trust, communication, and resource interdependence. DLH provides legitimacy and institutional facilitation; PLN offers technical and financial support through its CSR programs; while BSBM and the community act as producers of social and environmental value through daily recycling practices. These inter-actor interactions constitute a multi-level governance ecosystem in which policy direction, corporate innovation, and community participation mutually reinforce one another to drive behavioral and institutional transformation toward sustainability.

From a process perspective, the collaboration has evolved through three main phases—initiation, consolidation, and institutionalization—each demonstrating deepening coordination and shared ownership. The partnership initially led by PLN and facilitated by DLH has matured into a co-management system capable of producing tangible socio-economic impacts, such as income diversification, increased environmental awareness, and strengthened community organization. This process underscores that collaborative governance is an adaptive learning process rather than a static policy design.

Theoretically, this study contributes to integrating the concepts of polycentric governance (Ostrom, 2010), collaborative governance (Ansell & Gash, 2008; Emerson et al., 2012), and the circular economy (Kirchherr et al., 2017; Skene & Oarga-Mulec, 2024) into a unified analytical framework for understanding urban environmental management. Practically, the results highlight that the sustainability of waste governance depends not only on institutional alignment but also on the presence of social trust, reciprocal accountability, and enduring community empowerment.

Accordingly, CSR-based waste bank networks in Surabaya can be viewed as platforms for co-creation of public value, where government, private sector, and civil society collectively build locally rooted yet systemically connected environmental solutions. Future research is encouraged to explore the replicability of this model in other urban contexts and to examine how digitalization and social innovation may further strengthen the linkages between governance and the circular economy in the years ahead.

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