

Cross-Actor Collaboration in Environmental Governance

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ABSTRACT

Purpose: This study aims to examine cross-actor collaboration in environmental governance and its role in strengthening coordination, enhancing community participation, improving policy implementation, and addressing institutional challenges at the local level.

Subjects and Methods: This research employed a qualitative descriptive case study approach. Data were collected through semi-structured interviews, participant observation, and document analysis involving government officials, NGOs, academics, community leaders, environmental volunteers, and private sector actors. The data were analyzed using thematic analysis to identify recurring patterns and governance dynamics.

Results: The findings indicate that collaborative environmental governance in Palu has improved stakeholder coordination and community participation through joint environmental programs and participatory initiatives. However, collaboration remains constrained by inconsistent communication, overlapping institutional authority, limited funding, and unequal organizational capacities. The study also found that trust-building and informal relationships among actors significantly strengthen collaborative practices and improve governance effectiveness.

Conclusions: Effective environmental governance in Palu depends on sustainable institutional coordination, active community engagement, continuous communication, and long-term trust among stakeholders to support environmental sustainability and resilience.

INTRODUCTION

Environmental issues in urban areas are becoming increasingly complex with the increasing rate of urbanization, population growth, and pressure on natural resources (Patel & Raval., 2024; Arfanuzzaman & Dahiya, 2019). Cities in Indonesia face various environmental challenges, such as air and water quality degradation, increasing waste volumes, land conversion, and vulnerability to natural disasters. This situation demands a paradigm shift in environmental management that relies not solely on the role of the government but also involves various stakeholders in an active and integrated manner (Pasaribu & Kahpi, 2025).

The concept of environmental governance developed in response to the limitations of a top-down approach to environmental governance. Environmental governance emphasizes the importance of participatory, transparent, and adaptive decision-making processes, involving both state and non-state actors in natural resource management (Sawir & Sumardi, 2025). This approach is seen as capable of accommodating the complexity of multidimensional environmental issues while simultaneously increasing the legitimacy and effectiveness of public policies in the environmental sector.

One key element of environmental governance is cross-actor collaboration. Hutagalung & Hanani (2025) define collaborative governance as a joint decision-making process involving public and non-public actors in a formal forum to achieve common goals. In the context of environmental management, cross-actor collaboration enables resource synergy, knowledge exchange, and a more proportional division of roles. Furthermore, collaboration contributes to building trust among stakeholders and enhancing institutional capacity to address dynamic environmental challenges (Cahyono, 2026).

Palu City has geographic and social characteristics that make it both strategic and vulnerable to environmental issues. As a coastal city located in a disaster-prone zone, Palu faces challenges in spatial planning management, post-disaster environmental rehabilitation, and the protection of coastal ecosystems and watersheds. Furthermore, limited local government capacity, in terms of funding, human resources, and institutional infrastructure, often hinders the effective implementation of environmental policies. Therefore, the involvement of non-governmental actors such as local communities, civil society organizations, the private sector, and universities is becoming increasingly important in supporting environmental conservation efforts at the local level.

While cross-actor collaboration offers numerous potential benefits, its implementation on the ground is not always optimal. Several studies have shown that collaboration often faces obstacles such as differing interests between actors, unequal power relations, weak coordination between institutions, and low levels of trust (Kolk & Lenfant, 2015; Lubell, 2015). Furthermore, limited regulations supporting multi-stakeholder partnerships and suboptimal cross-sector coordination mechanisms also hinder the realization of collaborative and sustainable environmental governance.

In the Indonesian context, decentralization policies grant regional governments greater authority in environmental management. Decentralization also demands stronger governance capacity, particularly in building cross-sector and cross-actor collaboration at the local level (Meutia et al., 2025; Dipa et al., 2025). Palu City, as part of the regional government system, faces the challenge of developing an adaptive and contextual environmental governance model tailored to the social, economic, and ecological characteristics of its region.

Based on these conditions, this study aims to analyze the forms and patterns of cross-actor collaboration in environmental governance in Palu City, as well as to identify the roles of each stakeholder and the challenges faced in the collaborative process. This research is expected to provide theoretical contributions in the development of collaborative environmental governance studies, as well as provide practical recommendations for local governments and other stakeholders in strengthening sustainable environmental governance at the local level.

METHODOLOGY

Research Design

This study employed a qualitative research design with a descriptive case study approach to explore cross-actor collaboration in environmental governance in Palu, Indonesia. Qualitative research is appropriate for examining social interactions, institutional dynamics, and collaborative governance processes because it allows researchers to understand participants' experiences, perceptions, and interpretations within their natural contexts (Creswell & Poth, 2016). The case study approach was selected because environmental governance involves complex interactions among governmental institutions, civil society organizations, local communities, and private sector actors that cannot be adequately understood through quantitative measurement alone (Yin, 2018). The research specifically focused on how multiple stakeholders collaborate in addressing environmental issues in Palu, particularly after environmental challenges intensified due to rapid urban development, natural disasters, and climate-related vulnerabilities. The study investigated patterns of cooperation, communication mechanisms, policy coordination, and stakeholder participation in environmental management practices. Through this approach, the research sought to identify both enabling and constraining factors influencing collaborative environmental governance.

Research Location and Context

The research was conducted in Palu, a city that has experienced significant environmental pressures and governance challenges in recent years. Palu was selected as the research site because it represents an important case of environmental governance in Indonesia, particularly following the 2018 earthquake, tsunami, and liquefaction disaster that severely affected ecological systems, infrastructure, and community livelihoods. These conditions created a pressing need for collaborative governance involving state and non-state actors in environmental recovery and sustainable development planning. Environmental governance in Palu involves various institutions, including local government agencies, environmental organizations, community groups, universities, and private sector entities. The city's environmental issues include waste management, coastal degradation, land-use conflicts, disaster mitigation, and urban environmental sustainability. The interaction among these actors provides a rich context for examining collaborative governance practices in a post-disaster and rapidly developing urban environment. The study was conducted over a six-month period, allowing sufficient time for in-depth field engagement, data collection, and contextual understanding of governance processes. This prolonged engagement helped improve the credibility and trustworthiness of the findings.

Participants and Sampling Technique

The participants in this study consisted of representatives from governmental institutions, non-governmental organizations (NGOs), local communities, academics, and private sector actors involved in environmental governance initiatives in Palu. The selection of participants used purposive sampling, which is commonly employed in qualitative research to identify individuals who possess relevant knowledge and experience related to the research topic. The study involved approximately 20–25 informants who were directly engaged in environmental governance activities. Government participants included officials from environmental agencies, urban planning offices, and disaster management institutions. Non-governmental participants consisted of environmental activists, community leaders, and representatives from local advocacy organizations. Academic informants were selected from universities and research institutions involved in environmental studies and policy development. Private sector participants included business representatives participating in environmental sustainability programs or public-private partnerships. To broaden perspectives and ensure data richness, snowball sampling was also utilized during the research process. Initial informants recommended additional participants considered influential or actively engaged in collaborative environmental governance. This technique enabled the researcher to access broader networks and uncover hidden dimensions of inter-organizational collaboration.

Data Collection Techniques

Data were collected through semi-structured interviews, participant observation, and document analysis. The combination of these techniques allowed data triangulation and strengthened the comprehensiveness of the study findings. Semi-structured interviews served as the primary data collection method because they provided flexibility for participants to explain their experiences and perspectives in detail while still maintaining alignment with the research objectives. Interviews focused on themes such as stakeholder collaboration, environmental policy implementation, communication patterns, institutional coordination, public participation, and governance challenges. Each interview lasted approximately 45–90 minutes and was conducted either face-to-face or online, depending on participant availability. Participant observation was also conducted during environmental meetings, public discussions, and collaborative activities organized by governmental or community institutions. Observation enabled the researcher to directly examine interaction patterns, negotiation processes, and stakeholder participation in environmental governance practices. Field notes were recorded systematically to capture contextual information and non-verbal interactions relevant to the study. Document analysis was employed to examine policy documents, environmental reports, government regulations, strategic plans, meeting records, and media publications related to environmental governance in Palu. These documents provided institutional and historical context that complemented interview and observational data. The use of multiple data sources enhanced the depth and validity of the findings.

Table 1. Data Collection Methods and Sources

Data Collection Method	Data Sources	Purpose
Semi-structured Interviews	Government officials, NGOs, community leaders, academics, private sector actors	To explore perceptions and experiences of collaboration
Participant Observation	Environmental meetings and collaborative activities	To examine interaction patterns and governance practices
Document Analysis	Policy documents, reports, media publications	To understand institutional and regulatory contexts

Table 1 presents the primary data collection methods and sources utilized in this study to investigate cross-actor collaboration in environmental governance in Palu. The integration of semi-structured interviews, participant observation, and document analysis enabled the researcher to obtain comprehensive and multidimensional data regarding governance interactions, institutional coordination, and stakeholder participation. Each method contributed distinct forms of evidence that complemented one another throughout the research process.

Semi-structured interviews generated in-depth insights into the experiences, perceptions, and roles of various stakeholders involved in environmental governance, including government agencies, non-governmental organizations, academics, community leaders, and private sector actors. Through these interviews, the researcher was able to identify key issues related to collaboration, communication, policy implementation, and institutional challenges. Meanwhile, participant observation provided direct contextual understanding of how collaborative practices occurred in real situations, particularly during meetings, environmental programs, and public discussions. This method allowed the researcher to observe interaction patterns, negotiation processes, and stakeholder engagement beyond verbal explanations.

Document analysis strengthened the study by providing formal and historical information regarding environmental policies, regulations, strategic planning, and governance initiatives in Palu. The triangulation of these three data collection techniques enhanced the credibility, consistency, and validity of the research findings by allowing the researcher to compare information across multiple sources and perspectives.

Data Analysis Technique

The collected data were analyzed using thematic analysis. Thematic analysis is suitable for identifying, organizing, and interpreting recurring patterns within qualitative data. The analysis process began with data transcription and familiarization, during which interview recordings and field notes were carefully reviewed multiple times to gain a comprehensive understanding of the data. After familiarization, the researcher conducted open coding by identifying meaningful statements, phrases, and concepts related to collaboration and environmental governance.

Similar codes were then grouped into broader categories reflecting recurring themes such as institutional coordination, stakeholder participation, communication barriers, trust-building, policy implementation, and resource constraints. The categorized themes were interpreted using the framework of collaborative governance theory to understand how cross-actor interactions shape environmental governance processes in Palu. Throughout the analysis process, the researcher continuously compared findings across interviews, observations, and documents to ensure consistency and analytical rigor.

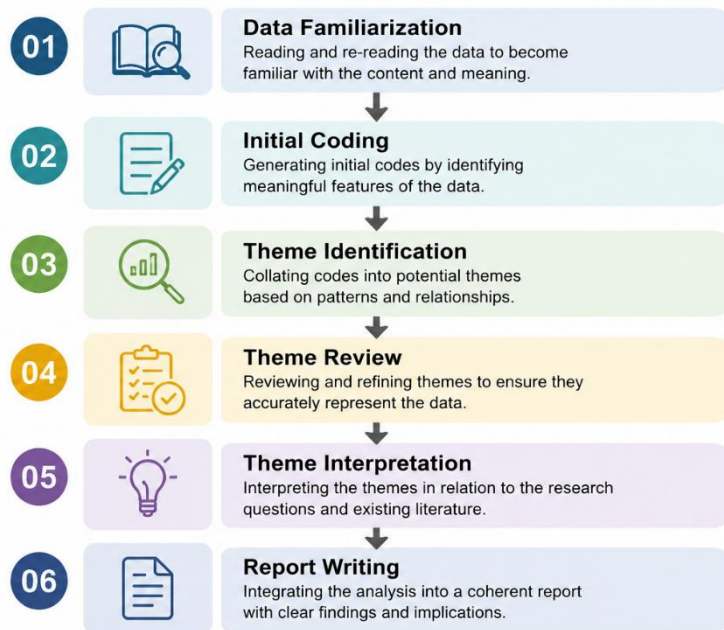


Figure 1. Stages of Thematic Data Analysis Adapted from Braun and Clarke (2021)

Figure 1 illustrates the systematic stages of thematic data analysis employed in this study. The process began with data familiarization, where the researcher repeatedly reviewed interview transcripts, observational notes, and relevant documents to gain a deep understanding of the collected information. The second stage involved initial coding, in which significant statements, concepts, and recurring issues related to environmental governance and cross-actor collaboration were identified and labeled. These initial codes were subsequently organized into broader categories during the theme identification stage to reveal patterns and relationships among stakeholders, governance practices, and institutional dynamics.

Following this process, the identified themes were reviewed and refined to ensure their relevance, coherence, and consistency with the research objectives. In the theme interpretation stage, the researcher analyzed the meanings and implications of the themes using the perspective of collaborative governance theory, particularly in understanding coordination, participation, and institutional interaction in environmental management in Palu. The final stage consisted of report writing, where the interpreted findings were systematically presented into a coherent analytical narrative. The sequential stages presented in Figure 1 demonstrate that thematic analysis is not merely a coding activity, but an iterative and interpretative process aimed at producing credible and meaningful qualitative findings.

Trustworthiness and Research Validity

To ensure the trustworthiness of the study, several qualitative validation strategies were employed, including triangulation, member checking, prolonged engagement, and peer debriefing. Triangulation was achieved by comparing data obtained from interviews, observations, and document analysis. This process helped verify information consistency across multiple sources and minimized potential bias. Member checking was conducted by sharing interview summaries and preliminary interpretations with selected participants to confirm the accuracy of the researcher’s understanding. This approach enhanced the credibility of the findings by ensuring that participants’ perspectives were represented appropriately. Prolonged engagement in the field enabled the researcher to develop a deeper understanding of the local governance context and establish trust with participants. In addition, peer debriefing with academic colleagues was undertaken to review coding processes, thematic interpretations, and analytical consistency. The study also maintained dependability and confirmability through systematic documentation of data collection procedures, coding decisions, and analytical memos. These records created an audit trail that increased the transparency and reliability of the research

process. Ethical considerations were carefully observed throughout the study, including informed consent, confidentiality protection, and voluntary participation of all informants.

RESULTS AND DISCUSSION

This section presents the findings of the study on cross-actor collaboration in environmental governance in Palu. The findings were obtained through semi-structured interviews, participant observation, and document analysis involving government officials, non-governmental organizations (NGOs), academics, community leaders, environmental volunteers, and private sector representatives. The results demonstrate that environmental governance in Palu is shaped by interactions among various actors who possess different institutional roles, capacities, and interests. The analysis identified four major themes emerging from the field data. The first theme concerns institutional coordination among actors in environmental governance. The second theme focuses on community participation and environmental awareness in collaborative environmental programs. The third theme highlights communication barriers and resource limitations affecting governance effectiveness. The final theme examines the role of trust-building and informal collaboration in sustaining environmental governance initiatives. These findings indicate that collaborative environmental governance in Palu operates through both formal institutional mechanisms and informal social relationships among stakeholders.

Institutional Coordination among Environmental Actors

The findings reveal that institutional coordination has become increasingly important in environmental governance practices in Palu, particularly after environmental and disaster-related challenges intensified in recent years. Participants consistently explained that environmental management cannot be handled by a single institution because environmental issues are interconnected with urban planning, waste management, coastal protection, and disaster mitigation.

Government institutions were generally perceived as formal coordinators of environmental governance programs. NGOs and community organizations often played important intermediary roles in facilitating communication between governmental institutions and local communities. Several participants stated that coordination forums and joint environmental activities improved communication among stakeholders, although overlapping authority and inconsistent coordination still occurred. One participant from a local environmental agency stated:

“Right now the coordination is actually much better than before. After the disaster, many institutions realized they can’t just work by themselves anymore. We usually have meetings with NGOs, local communities, and sometimes universities too. But honestly, sometimes there’s still confusion about who should handle certain environmental issues.” (Participant 4, Government Environmental Agency)

Similarly, an NGO representative emphasized that collaboration often depended on continuous communication among institutions:

“What usually happens is everybody agrees during meetings, but after that the follow-up becomes weak. We try to keep communication running because if institutions stop talking to each other, environmental programs usually don’t continue properly. Communities also become confused about which institution they should contact.” (Participant 8, Environmental NGO Representative)

Observation findings also indicated that collaborative activities such as environmental campaigns, coastal clean-up programs, and waste management initiatives frequently involved multiple stakeholders simultaneously. These activities strengthened interaction among actors and encouraged more integrated environmental governance practices.

Table 1. Forms of Cross-Actor Collaboration in Environmental Governance

Actors Involved	Forms of Collaboration	Main Purpose
Government agencies and NGOs	Environmental campaigns and policy coordination	Public awareness and environmental management
NGOs and local communities	Waste management initiatives	Community participation

Universities and local government	Environmental research and training	Policy support and capacity building
Private sector and government institutions	Sustainability and CSR programs	Environmental protection initiatives

Source: Field Interview Data (2026).

Collaboration in environmental governance involved both formal and informal institutional arrangements. Government agencies generally focused on policy coordination and environmental regulation, while NGOs and communities emphasized implementation at the local level. Universities contributed through environmental education and research support, whereas private sector actors participated mainly through sustainability and corporate social responsibility programs.

Community Participation and Environmental Awareness

Another major finding concerns the growing role of community participation in environmental governance in Palu. Participants explained that environmental programs were more effective when local communities were directly involved in planning and implementation processes. Community participation was particularly visible in waste management programs, coastal conservation activities, and environmental awareness campaigns. Several participants noted that public awareness regarding environmental issues has increased significantly since the environmental disasters experienced by the city. Residents became more aware that environmental degradation could directly affect livelihoods, public safety, and community wellbeing. However, participants also explained that participation levels varied depending on leadership, institutional support, and program continuity.

A community leader explained:

“People here are more aware now compared to a few years ago. Before, waste problems and environmental issues were often ignored. But after the disaster, residents started realizing that environmental damage can affect everyone. Even so, participation still depends a lot on local leaders and whether programs continue consistently.” (Participant 11, Community Leader)

Another participant involved in community-based environmental programs stated:

“When communities are invited directly into environmental activities, they usually participate actively. The problem is sometimes programs only run for a short time. People become enthusiastic at the beginning, but if there’s no follow-up, participation slowly decreases again.” (Participant 9, Environmental Volunteer)

Field observations further revealed that collaborative environmental activities strengthened relationships between local communities and institutions. Community-based environmental programs encouraged residents to engage more actively because the activities addressed practical concerns such as waste disposal, flooding, and neighborhood cleanliness.

Table 2. Community Participation in Environmental Governance Programs

Community Activities	Stakeholders Involved	Observed Outcomes
Coastal clean-up campaigns	NGOs, youth groups, local residents	Increased environmental awareness
Waste management training	Government institutions and communities	Improved waste sorting practices
Environmental education programs	Universities, schools, NGOs	Greater public participation
Community discussion forums	Government officials and local leaders	Better communication among actors

Source: Observation and Interview Data (2026)

Environmental governance became more effective when communities were involved directly in practical environmental activities rather than only receiving information from institutions.

Community participation also contributed to stronger social relationships among stakeholders involved in environmental programs.

Communication Barriers and Resource Constraints

Although collaboration among actors has improved, the study identified several challenges affecting the effectiveness of environmental governance in Palu. The most common problems mentioned by participants included limited funding, inconsistent communication, overlapping institutional authority, and unequal resource capacity among organizations. Participants explained that many environmental programs relied heavily on short-term project funding. As a result, collaborative activities often became difficult to sustain once financial support ended. Communication problems also emerged because institutions frequently prioritized their own organizational interests and administrative procedures rather than collective environmental objectives.

One NGO activist stated:

“The biggest issue is sustainability. Many programs start really well because there’s funding and public attention. But after a few months, coordination becomes weaker. Some institutions stop communicating regularly, and communities also lose interest because activities are no longer consistent.” (Participant 7, NGO Activist)

A government participant similarly explained:

“We already have environmental policies and collaborative programs, but implementation is still challenging. Different institutions have different priorities and budgets. Sometimes coordination meetings happen regularly, but actual implementation in the field can still be slow.” (Participant 3, Local Government Official)

Document analysis also showed that although environmental governance policies emphasized collaboration, implementation mechanisms were often unclear. Several strategic documents encouraged inter-agency coordination, yet practical responsibilities among institutions frequently overlapped.

Table 3. Major Challenges in Cross-Actor Environmental Governance

Main Challenges	Impacts on Governance
Limited funding	Program discontinuity
Inconsistent communication	Weak coordination among actors
Institutional overlap	Unclear responsibilities
Unequal organizational capacity	Implementation gaps
Bureaucratic procedures	Slow policy implementation

Source: Field Interview and Document Analysis Data (2026)

Governance challenges were not only technical but also institutional and relational. Environmental governance effectiveness therefore depended heavily on sustained coordination and communication among actors.

Trust Building and Informal Collaboration

The final finding concerns the role of trust and informal collaboration in strengthening environmental governance practices in Palu. Participants repeatedly emphasized that successful collaboration often depended more on interpersonal relationships and informal communication than on formal institutional agreements alone. Several participants explained that trust was developed gradually through repeated interactions, collaborative activities, and long-term engagement between institutions and communities. Informal communication channels often enabled faster coordination compared to formal bureaucratic procedures.

One environmental volunteer explained:

“Sometimes informal communication works much faster than official meetings. People already know each other from previous environmental activities, so coordination becomes easier when problems happen. Trust is important because if institutions don’t trust each other, collaboration usually becomes difficult.” (Participant 13, Environmental Volunteer)

An academic participant also highlighted the importance of informal relationships:

“Environmental governance is not only about regulations or formal cooperation documents. What matters is whether actors are willing to maintain communication and relationships consistently. In many cases here, successful programs actually started from informal discussions between communities, NGOs, and academics.” (Participant 15, Academic Researcher)

Observation findings further demonstrated that trust-building practices were particularly visible in community-based environmental initiatives. Participants were generally more willing to engage in collaborative activities when communication felt inclusive and less hierarchical. Informal collaboration also helped reduce institutional tensions and improved stakeholder participation. The findings demonstrate that cross-actor collaboration in environmental governance in Palu is influenced by institutional coordination, community participation, communication dynamics, resource capacity, and trust-building processes. Although formal governance structures remain important, collaborative environmental management largely depends on sustained interaction, stakeholder commitment, and the ability of actors to maintain cooperative relationships over time.

Discussion

Strengthening Collaborative Environmental Governance through Institutional Coordination, Community Participation, and Trust Building

The findings of this study demonstrate that cross-actor collaboration plays a crucial role in strengthening environmental governance in Palu, particularly in addressing complex environmental challenges that cannot be managed by a single institution. The results indicate that environmental governance in Palu operates through interactions among governmental institutions, NGOs, local communities, academics, and private sector actors. These interactions reflect the principles of collaborative governance, where public problems are addressed collectively through shared decision-making, communication, and stakeholder participation. The findings also reveal that collaboration remains constrained by institutional fragmentation, inconsistent communication, unequal organizational capacities, and limited sustainability of environmental programs.

One important finding of this study is the growing institutional coordination among actors after environmental disasters and urban environmental pressures increased in Palu (Daswati et al., 2020; Sagala et al., 2021). This finding supports collaborative governance theory, which argues that environmental problems encourage institutions to cooperate because environmental risks are interconnected and cross-sectoral. The study found that coordination forums, joint environmental campaigns, and community-based environmental activities have improved interaction among stakeholders. Overlapping institutional authority and unclear responsibilities continue to weaken governance effectiveness. Similar conditions have been identified in environmental governance studies in developing regions, where institutional competition and fragmented bureaucracy often hinder collaborative policy implementation.

The findings suggest that strengthening institutional coordination requires the establishment of clearer governance mechanisms and long-term collaborative structures. Environmental governance in Palu would benefit from a formal coordination framework that clearly defines the responsibilities of each stakeholder, including governmental agencies, NGOs, academic institutions, and community organizations. Regular multi-stakeholder meetings and integrated environmental planning mechanisms could reduce institutional overlap and improve communication consistency. In addition, collaborative environmental databases and shared information systems could support better coordination among actors by ensuring that institutions operate using the same environmental data and policy priorities (Sarker, 2025; Aggestam et al., 2020; Velander, 2025; Hawkins et al., 2018).

Another significant finding concerns the role of community participation in environmental governance. The study demonstrates that environmental programs become more effective when local communities are directly involved in environmental activities such as waste management, coastal conservation, and environmental education. This finding aligns with participatory governance perspectives, which emphasize that community engagement increases policy legitimacy,

environmental awareness, and program sustainability. In the context of Palu, environmental disasters appear to have increased public awareness regarding the relationship between environmental degradation and social vulnerability. Communities increasingly recognize that environmental protection directly affects public safety, livelihoods, and local resilience (Alam et al., 2022; Engle & van, 2022).

Despite these positive developments, the study also reveals that community participation remains highly dependent on program continuity and local leadership. Many environmental initiatives lose momentum once external funding declines or institutional support weakens. This indicates that environmental governance still relies heavily on short-term project-based interventions rather than long-term community empowerment strategies. To address this issue, environmental governance programs should prioritize sustainable community engagement mechanisms. Local governments and NGOs need to develop community-based environmental institutions that continue operating beyond temporary projects. Community participation should also be integrated into local environmental policymaking processes rather than limited to implementation activities alone (Uittenbroek et al., 2019; Dorst et al., 2022).

The findings further reveal that communication barriers and resource limitations remain major obstacles in collaborative environmental governance. Participants consistently reported that coordination among institutions often becomes inconsistent after the initial stages of environmental programs. This problem reflects broader governance challenges in decentralized environmental management systems, where institutions frequently operate according to separate administrative priorities and resource capacities. Limited funding also contributes to program discontinuity, particularly for community-based environmental initiatives that depend on external project support (Donessouné et al., 2023; Celata & Coletti, 2019; Cronmiller & Noble, 2018; Brondizio et al., 2021; Espinosa et al., 2026).

Addressing these challenges requires both institutional and financial reforms. First, stronger inter-organizational communication systems are necessary to maintain coordination beyond formal meetings. Environmental governance actors should establish continuous communication platforms involving government agencies, NGOs, academics, and community representatives. These platforms could function as spaces for collaborative problem-solving, information exchange, and conflict resolution. Second, local governments should allocate more stable funding for collaborative environmental programs instead of relying primarily on short-term external projects. Sustainable financing mechanisms would improve program continuity and strengthen stakeholder commitment.

The study also highlights the importance of trust-building and informal collaboration in environmental governance practices. Interestingly, many participants perceived informal communication and personal relationships as more effective than formal bureaucratic procedures in facilitating environmental collaboration (Park et al., 2021; Whetsell et al., 2021; Batist, 2024; Terman et al., 2020; Song et al., 2019). This finding indicates that governance effectiveness is influenced not only by institutional structures but also by social relationships and interpersonal trust among actors. Trust enables stakeholders to coordinate more efficiently, reduce institutional tensions, and sustain collaborative activities over time.

The importance of trust-building is particularly relevant in post-disaster contexts such as Palu, where environmental governance requires rapid coordination and collective action. Informal collaboration often emerges because formal governance systems may be too slow or rigid to respond effectively to local environmental challenges. Therefore, governance approaches in Palu should not focus exclusively on strengthening formal institutions but also on supporting social networks and collaborative community relationships. Community forums, participatory environmental programs, and inter-organizational partnerships can strengthen trust among stakeholders and improve long-term governance resilience (Staiculescu, 2024; Bianchi, 2021; Ge et al., 2023; Yang et al., 2022).

The findings suggest that effective environmental governance in Palu depends on the ability of actors to balance formal institutional coordination with participatory and relational governance practices. Environmental problems in urban and disaster-prone areas are inherently complex and require adaptive governance approaches that integrate institutional collaboration, community participation, resource sustainability, and social trust. The study therefore contributes to the understanding that

collaborative environmental governance is not merely a technical or administrative process, but also a social and relational practice shaped by communication, shared responsibility, and long-term stakeholder engagement.

From a practical perspective, the study highlights the need for more integrated environmental governance strategies in Palu. Policymakers should strengthen cross-sector collaboration frameworks, improve community-based environmental education, and ensure sustainable funding for collaborative environmental initiatives. In addition, governance actors should prioritize trust-building and inclusive participation to enhance environmental resilience and long-term sustainability. These efforts are essential for developing more adaptive and collaborative environmental governance systems capable of addressing future environmental and disaster-related challenges in Palu.

CONCLUSION

Cross-actor collaboration has become a fundamental element in strengthening environmental governance in Palu, particularly in addressing complex environmental challenges in post-disaster and urban development contexts. The findings demonstrate that environmental governance in Palu involves dynamic interactions among governmental institutions, NGOs, local communities, academics, and private sector actors, each contributing different roles and capacities in environmental management. The study reveals that collaborative governance has improved institutional coordination, increased community participation, and enhanced environmental awareness through joint environmental programs and participatory initiatives. However, the effectiveness of collaboration remains constrained by inconsistent communication, overlapping institutional authority, limited funding, and unequal organizational capacities. In addition, the findings highlight that trust-building and informal relationships among actors significantly influence the sustainability of collaborative environmental governance practices. Therefore, strengthening environmental governance in Palu requires clearer institutional coordination mechanisms, sustainable community engagement, continuous inter-organizational communication, and long-term collaborative partnerships among stakeholders. This study contributes to the broader understanding of collaborative governance by emphasizing that environmental governance is not only shaped by formal institutional structures but also by social relationships, trust, and collective commitment among actors in achieving environmental sustainability.

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