



Enhancing REDD+ Effectiveness in Indonesia Through Governance Reforms, Sustainable Finance, and Community Participation

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Abstract

The global REDD+ framework designed to curb greenhouse gas emissions by reducing deforestation and forest degradation has become a central pillar of international climate mitigation efforts, particularly in tropical forest nations such as Indonesia. Despite its significant potential, the implementation of REDD+ in Indonesia continues to encounter systemic barriers that undermine its effectiveness. Key challenges include fragmented and weak governance systems, inconsistent and unpredictable financial support, unresolved land tenure arrangements, and the persistent exclusion of indigenous and local communities from meaningful participation in forest management. These structural limitations diminish the capacity of REDD+ to generate measurable and sustained climate benefits. This study provides an in depth examination of the institutional, socio-political, and economic obstacles that constrain REDD+ performance in Indonesia. It argues that the current project oriented and carbon-accounting-driven model must evolve into a more integrated governance architecture that aligns environmental conservation with livelihood security and equitable resource distribution. To strengthen REDD+ outcomes, the research advances several policy innovations, including the decentralization of forest governance, diversification of long-term financing pathways, recognition and protection of customary land rights, and systematic incorporation of local ecological knowledge. Enhanced monitoring, reporting, and verification (MRV) systems are also highlighted as essential for ensuring transparency and accountability. Insights from case studies in Central Kalimantan and West Papua further demonstrate that the durability of REDD+ initiatives hinges on community empowerment, clear land tenure arrangements, and reliable funding mechanisms. Together, these findings emphasize the urgent need to redesign REDD+ governance in Indonesia to ensure it functions not only as a climate mitigation instrument but also as a socially just and economically viable conservation strategy.

Keywords: *REDD+ Implementation; Forest Governance; Land Tenure Security; Sustainable Financing*

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INTRODUCTION

The accelerating decline of global forest cover has emerged as one of the most pressing challenges for international climate mitigation efforts [1], [2]. Forest ecosystems regulate the global carbon cycle, yet ongoing deforestation and forest degradation continue to release large quantities of stored carbon, contributing an estimated 12–17 percent of anthropogenic greenhouse gas emissions [3], [4], [5]. These conditions underscore the necessity of policy instruments that can slow forest loss while supporting emission reduction commitments. In response, the United Nations Framework Convention on Climate Change (UNFCCC) introduced the Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism to incentivize developing countries to conserve forests, enhance carbon stocks, and adopt sustainable land-use practices.

Indonesia has become a priority country in the global REDD+ architecture due to its vast tropical forest area and its significant contribution to global emissions from land-use change [6], [6], [7]. Despite its ecological importance, Indonesia continues to experience high deforestation rates driven by agricultural expansion, illegal logging, mining, infrastructure development, and weak regulatory enforcement [8], [9], [10], [11], [12]. Although Indonesia is considered an early adopter of REDD+ and has developed various institutional and policy frameworks to support its implementation, substantial barriers remain. These include fragmented governance arrangements, limited institutional capacity, inconsistent and short-term financial mechanisms, and long-standing land tenure conflicts involving communities, government institutions, and private companies [13], [14], [15], [16], [17]. As a consequence, Indonesia remains among the highest greenhouse gas emitters in Southeast Asia, contributing approximately 1.6 percent of global emissions [18], [19].

While REDD+ was conceived as a mechanism capable of linking climate mitigation with socio-economic development and biodiversity protection, its implementation in Indonesia has yet to achieve the expected level of effectiveness. Persistent challenges including the risk of deforestation displacement (*leakage*), the dominance of market-based approaches, insufficient community participation, and inadequate integration of local knowledge continue to undermine program outcomes [20], [21]. Moreover, concerns have emerged regarding the ability of carbon-market incentives and performance-based payments to compete with the economic drivers of deforestation such as plantation agriculture, extractive industries, and infrastructure expansion. These issues highlight the need for a more adaptive, integrated, and socially inclusive REDD+ framework that aligns environmental goals with the socio-political realities of Indonesia [22], [23].

Existing scholarship on REDD+ implementation in Indonesia has extensively documented persistent barriers such as fragmented forest governance, overlapping institutional mandates, and weak regulatory legitimacy [24], [25]. Other studies highlight chronic financial constraints, including donor dependency, short-term funding cycles, and limited integration of financial mechanisms into national policy frameworks [26]. Research on social safeguards similarly notes that the exclusion of indigenous peoples and the insecurity of customary land tenure continue to undermine community participation and weaken long-term conservation outcomes [27], [28], [29]. Although these studies provide valuable insights into governance failures, financial limitations, and social inequalities, the current literature remains fragmented and does not offer a comprehensive policy framework that integrates governance reform, institutional capacity building, sustainable financing, land tenure clarification, social legitimacy, and verifiable emission reduction outcomes into a unified operational model. Moreover, the limited number of

comparative, cross-regional analyses such as differences observed between Aceh, Central Kalimantan, and West Papua indicates a continuing analytical gap in understanding why certain regions perform better than others in REDD+ implementation [30], [31]. This gap underscores the need for a more holistic, adaptive, and context-responsive policy approach that can strengthen REDD+ effectiveness across diverse socio-ecological settings in Indonesia.

This study aims to critically examine the institutional, financial, and socio-political barriers that hinder the effectiveness of REDD+ implementation in Indonesia. It seeks to analyze how governance structures, land tenure systems, funding arrangements, and stakeholder participation shape REDD+ outcomes across different regions of the country. Based on these insights, the research aims to develop an integrated policy model that promotes decentralized governance, sustainable financing, strengthened tenure rights, and meaningful community engagement as essential components for improving REDD+ performance [need citation]. The overarching objective is to contribute to the advancement of a more coherent, equitable, and operationally resilient REDD+ framework capable of supporting Indonesia's forest conservation and climate mitigation goals.

METHODS

This study employs a qualitative methodological framework to assess the performance of REDD+ implementation in Indonesia and to identify policy innovations capable of strengthening its long-term effectiveness. Qualitative inquiry is particularly suited for this research because REDD+ operates within a complex governance landscape shaped by political negotiations, economic incentives, institutional constraints, and community-level dynamics. Such intricacies require an interpretive approach that can capture the depth of social, institutional, and policy processes influencing outcomes, rather than relying solely on numerical indicators.

Research Design

A multiple case study design was adopted to provide a contextualized and comparative analysis of REDD+ implementation in two prominent regions: Central Kalimantan and West Papua. These cases were deliberately selected because they represent distinct socio-political and ecological contexts, levels of institutional readiness, and community participation models within Indonesia's broader REDD+ framework. The case study approach enables a detailed examination of how REDD+ policies are translated into practice, the extent to which governance arrangements support or hinder implementation, and how local factors shape policy outcomes. This design also facilitates cross-case comparison, allowing the study to identify both shared and context-specific barriers. Through this approach, the research is able to interrogate how national REDD+ strategies interact with regional governance structures, financial systems, and community interests. The design therefore supports the development of nuanced insights and evidence-based recommendations for strengthening REDD+ implementation across diverse settings.

Data Collection

All data used in this research were derived from secondary sources, selected to provide comprehensive coverage of REDD+ policy development and implementation in Indonesia. Data were obtained from four major categories:

1. Academic Publications

Peer-reviewed journal articles, scholarly books, and empirical studies supplying conceptual, methodological, and contextual insights into REDD+, climate governance, land tenure, and forest policy.

2. International Organizational Reports

Publications produced by the UNFCCC, the World Bank, the UN-REDD Programme, CIFOR, and other global institutions involved in climate finance and forest conservation. These sources provide data on global REDD+ frameworks, monitoring standards, and financial flows.

3. National Policies and Institutional Documents

Indonesian government regulations, strategic plans, ministerial decrees, and NGO policy briefs that outline national and regional strategies for forest governance, land administration, and REDD+ implementation.

4. Project Evaluations and Case Assessments

Evaluation reports and documentation from REDD+ pilot projects, especially those undertaken in Central Kalimantan and West Papua, providing practical insights into project outcomes, challenges, and local engagement.

Document selection followed a systematic search strategy using databases such as Scopus, Web of Science, JSTOR, and Google Scholar, supplemented by institutional repositories. Inclusion criteria emphasized relevance, credibility, methodological clarity, and timeliness. Sources lacking transparency, reliability, or analytical rigor were excluded to ensure the validity of the findings.

Data Analysis

Data were analyzed using thematic analysis, a method that facilitates the systematic identification and interpretation of recurring patterns within qualitative data. The analytical process proceeded in three stages:

1. Open Coding

Key statements and concepts relevant to REDD+ implementation—such as governance challenges, participation dynamics, financial structures, and land tenure issues—were coded across documents. This initial stage allowed the researcher to organize diverse data into manageable segments.

2. Axial Coding

Coded segments were grouped into broader thematic categories to reveal underlying relationships among institutional, socio-economic, and policy variables. This stage helped illuminate how governance fragmentation, funding inconsistencies, and socio-political conflicts converge to affect REDD+ outcomes.

3. Selective Coding

Themes were synthesized to construct a coherent analytical narrative explaining how the interplay of governance, financial mechanisms, and community-level factors shapes the overall effectiveness of REDD+ in Indonesia. This stage also informed the formulation of a conceptual policy model that underpins the study’s recommendations.

Through its thematic and comparative structure, the analysis moves beyond descriptive summaries and instead offers a substantive interpretation of the structural forces enabling or constraining REDD+ implementation. The approach enhances the analytical depth of the study and supports the development of targeted and context-sensitive policy innovations.

To provide a clear overview of the methodological structure employed in this study, Figure 1 presents the sequential flow of the research process. This diagram illustrates how research design, secondary data collection, thematic analysis, and analytical purpose are systematically integrated into a coherent methodological framework.

RESEARCH METHODOLOGY FLOWCHART

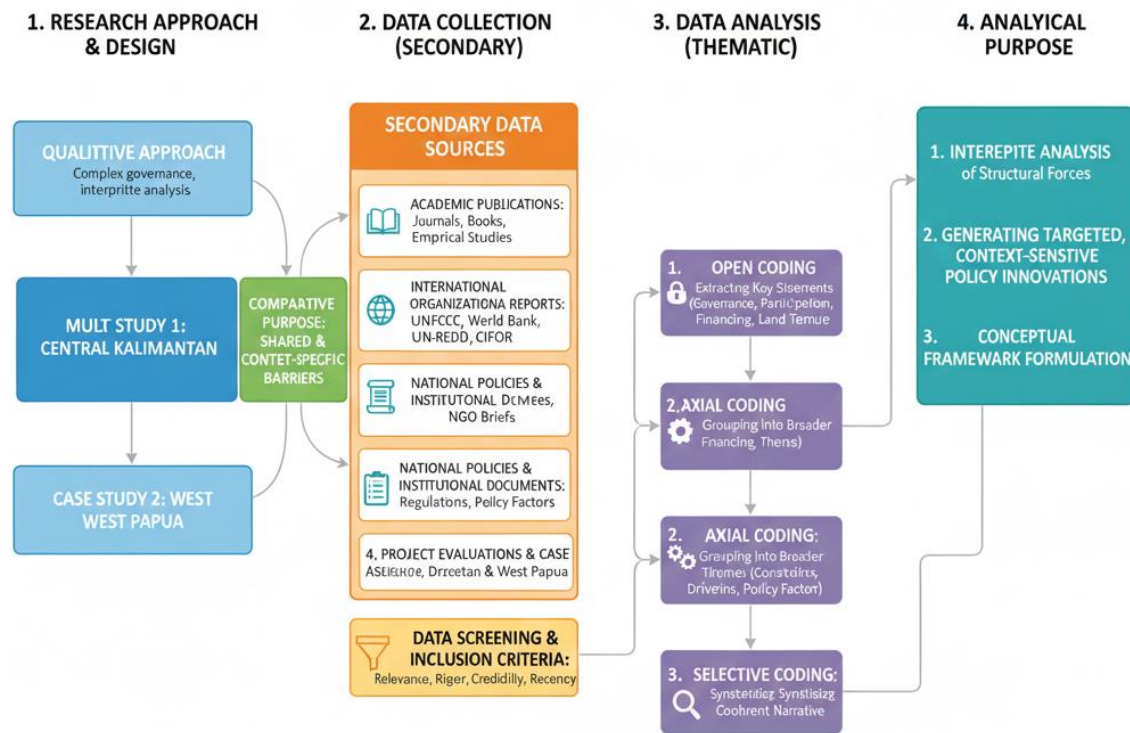


Figure 1. Research Methodology Flowchart

RESULT AND DISCUSSIONS

The REDD+ framework was introduced as a global response to emissions from deforestation and forest degradation, which constitute a major share of anthropogenic greenhouse gases. Conceived as both a climate mitigation mechanism and a pathway for delivering social and ecological co-benefits, REDD+ seeks to link emission reduction commitments with poverty alleviation, biodiversity protection, and sustainable development for forest-dependent communities. Although the framework provides a robust theoretical basis for achieving these goals, its practical implementation in complex national contexts such as Indonesia requires a deeper interrogation of the governance environment, institutional capacity, land tenure arrangements, financial structures, and socio-economic dynamics that shape outcomes on the ground. This section elaborates on the key conceptual pillars that underpin REDD+ implementation and presents insights drawn from two contrasting case studies Central Kalimantan and West Papua to illustrate how these concepts are translated into practice and why implementation successes vary.

The analysis of Indonesia’s REDD+ implementation reveals a set of structural, governance, socio-economic, and financial constraints that significantly shape the outcomes of forest conservation efforts. These findings are further illustrated through two major case studies Central Kalimantan and West Papua which demonstrate how variations in land tenure systems, governance models, and community participation affect REDD+ performance. To strengthen the clarity of these findings, **Table 1** provides a comparative overview of REDD+ implementation in both regions, highlighting key issues, approaches, and policy implications.

Table 1. Comparative Summary of REDD+ Implementation in Central Kalimantan and West Papua

Analytical Dimension	Central Kalimantan	West Papua
Implementation Model	Top-down, government-driven REDD+ pilot projects	Community-based, participatory REDD+ led by indigenous groups
Key Environmental Context	High deforestation due to palm oil expansion, logging, mining, and land conversion	Lower deforestation but high pressure from potential development and resource extraction
Governance Characteristics	Fragmented governance; weak coordination across administrative levels	Coordination gaps between provincial and national authorities; inconsistent policy alignment
Land Tenure Situation	High conflict; overlapping claims between communities, government, and concession holders	Stronger customary (adat) land rights recognition but still lacking formal mapping and legal codification
Community Engagement	Limited involvement; communities often excluded from decision-making	High participation; empowerment through land rights and cultural stewardship
MRV (Monitoring, Reporting, Verification)	Weak MRV capacity; limited enforcement and carbon monitoring systems	MRV systems underdeveloped, leading to uncertainty in emission reduction claims

Financial Sustainability	Heavy reliance on external donor funds; insufficient long-term financing	Incentives tied to participation, yet funding remains donor-dependent and unstable
Primary Barriers	Land tenure disputes, institutional weakness, inconsistent funding	Weak MRV, limited institutional capacity, governance fragmentation
Primary Strengths	Large forest area providing significant potential for carbon gains	Strong cultural connection to land; high legitimacy for conservation efforts
Policy Implications	Requires land rights reform, domestic financing, and stronger coordination	Needs MRV strengthening, cross-level governance integration, and sustainable local funding

Governance

Governance constitutes the foundational determinant of REDD+ effectiveness, shaping the design, enforcement, coordination, and accountability of the program. Indonesia’s forest governance landscape is marked by institutional fragmentation driven by decentralization, overlapping mandates, and inconsistent political priorities. While decentralization was intended to empower regional authorities, it has frequently resulted in uncoordinated land-use decision-making and an uneven capacity to enforce national forest laws. Weak coordination between national, provincial, and district governments creates policy misalignment, undermines MRV (monitoring; reporting; verification) systems, and contributes to gaps in enforcement. Persistent corruption in the forestry sector further erodes transparency and accountability. Corrupt practices including illicit permit allocation, illegal logging protection, and rent-seeking behavior continue to undermine REDD+ objectives by facilitating unsustainable land-use expansion. Effective REDD+ governance therefore requires not only strong vertical coordination across government levels but also inclusive governance models that formally integrate local and indigenous communities into decision-making processes.

Institutional Capacity

Institutional capacity refers to the ability of state institutions and implementing agencies to design, coordinate, and operationalize REDD+ policies. In the Indonesian context, limited human resources, inadequate technical expertise, and insufficient infrastructure impede the translation of national REDD+ strategies into local action. Local authorities often lack the personnel and financial means to enforce forest protection, monitor carbon stocks, or prevent illegal land encroachment. Additionally, coordination difficulties across ministries such as those handling forestry, land planning, agriculture, and environment create bureaucratic complexity. Weak institutional capacity not only affects implementation efficiency but also jeopardizes the reliability of MRV systems that form the basis for international financing. Strengthening institutional capacity is therefore fundamental for promoting effective forest governance and sustaining REDD+ initiatives.

Land Tenure

Secure land tenure is central to the legitimacy and long-term viability of REDD+ initiatives. In Indonesia, ambiguous land ownership and overlapping claims between customary communities, government agencies, and private companies frequently lead to conflict. Unclear land rights enable illegal logging, land grabbing, and unregulated plantation expansion, all of which accelerate deforestation. Without legally recognized land rights, local communities may hesitate to participate in REDD+ initiatives or may oppose them due to fear of losing access to subsistence resources. Ensuring secure and equitable tenure rights for indigenous and forest-dependent peoples is essential for building trust, strengthening community stewardship, and fostering long-term investment in forest conservation.

Financial Mechanisms

REDD+ financial mechanisms are designed to reward measurable emission reductions, yet financial instability remains a persistent challenge. International funds have often provided the initial resources for project implementation, but these contributions are irregular and insufficient to sustain long-term forest management. The heavy reliance on donor financing makes REDD+ vulnerable to shifts in global political priorities, leaving projects underfunded once initial grants expire. Results-based financing, while conceptually sound, is difficult to operationalize in contexts where MRV systems are underdeveloped or where institutional capacity is weak. For REDD+ to become financially sustainable, financing must be diversified through market mechanisms, national budget allocation, sustainable livelihood programs, and integration with other development sectors such as agroforestry, ecotourism, and sustainable agriculture.

Socio-economic Drivers of Deforestation

Deforestation in Indonesia is driven by entrenched socio-economic forces, including agricultural expansion (particularly palm oil), mining, logging, and rural livelihood pressures. While REDD+ focuses primarily on protecting forests and reducing emissions, it does not automatically address the underlying economic incentives that make deforestation profitable. For REDD+ to be effective, alternative livelihood pathways must be created to reduce community dependence on forest clearing. Integrating sustainable land-use practices—such as agroforestry, diversified agriculture, and non-timber forest products into REDD+ strategies can help reduce pressure on forests and improve community well-being.

Market Mechanisms

REDD+ incorporates market-based instruments that allow countries to generate carbon credits from emission reductions. These credits can be traded internationally, creating financial incentives for conservation. However, an overly carbon-centric approach can obscure the broader ecological and social functions of forests, reducing them to carbon storage units while overlooking biodiversity, cultural heritage, and water regulation services. Market-driven REDD+ models must therefore be complemented with policies that value multiple ecosystem services and incorporate equity and social safeguards to ensure holistic conservation outcomes.

Social Equity

Social equity is essential to ensuring that REDD+ delivers fair and inclusive benefits. In practice, many REDD+ projects have excluded indigenous and local communities from decision-making

processes, leading to perceptions of REDD+ as an externally imposed, top-down program. When benefits flow disproportionately to government agencies or private actors, community trust declines and participation weakens. Equitable benefit-sharing requires the formal recognition of land rights, transparent payment distribution mechanisms, and active community involvement in governance structures.

Sustainability

The long-term sustainability of REDD+ depends on its integration into national development planning, land-use policy reforms, and broader socio-economic strategies. Without structural reforms addressing land tenure, market pressures, governance weaknesses, and community livelihood needs, REDD+ risks becoming a temporary mitigation effort rather than a transformative policy tool. Sustainable REDD+ implementation requires an integrated approach that combines environmental conservation with socio-economic development, institutional strengthening, and cross-sectoral coordination.

Case Study 1: REDD+ in Central Kalimantan

Central Kalimantan serves as one of Indonesia's earliest REDD+ testing grounds. Despite its ecological significance, the region continues to experience accelerated deforestation driven by palm oil expansion, illegal logging, and mining. The case reveals that unresolved land tenure conflicts are among the most significant barriers to REDD+ effectiveness. Overlapping claims between local communities, concession holders, and government authorities undermine community participation and create an environment conducive to exploitation and unsustainable land use. Financial sustainability is also a core issue. While international funding enabled the initial implementation of REDD+ pilot projects, the absence of consistent long-term financing has resulted in stalled progress. Donor dependency renders REDD+ initiatives vulnerable to shifting external priorities. Moreover, inadequate institutional capacity at the district level hampers enforcement, monitoring, and coordination. These structural challenges illustrate why REDD+ in Central Kalimantan has produced uneven results despite early optimism. If land tenure reform and domestic financing mechanisms are prioritized, Central Kalimantan could demonstrate how REDD+ can support both conservation and community welfare. However, without these structural changes, REDD+ is unlikely to achieve durable success.

Case Study 2: Community-Based REDD+ in West Papua

West Papua represents a contrasting approach through its community-based REDD+ model, which centers on secure land rights and participatory governance. By recognizing customary land ownership and enabling local communities to take an active role in decision making, West Papua demonstrates higher levels of community engagement and greater social legitimacy for REDD+. However, challenges remain. Weak coordination between national and regional authorities results in policy overlaps and implementation inconsistencies. MRV systems in the region remain underdeveloped, raising concerns about the accuracy of emission reduction claims—a key requirement for results based financing. Moreover, financial dependence on donors threatens program continuity, as community incentives become unstable once external funding ends. Despite

these constraints, the West Papua case highlights the transformative potential of community-driven REDD+ when supported by strong social institutions, secure tenure rights, and meaningful participation. With strengthened MRV systems and sustainable domestic financing, the model could serve as a blueprint for community-based conservation across Indonesia.

Discussion

The findings of this study demonstrate that the effectiveness of REDD+ implementation in Indonesia is profoundly shaped by governance quality, land tenure security, financial stability, and community participation [7], [25], [32], aligning closely with patterns identified in earlier research. Previous studies have consistently shown that decentralization in Indonesia has produced fragmented forest governance structures that weaken policy enforcement and hinder coordination across administrative levels [33], [34], [35], a condition strongly reflected in the Central Kalimantan case where top-down approaches intensified land conflict and created limited local ownership [36]. Similarly, the persistent uncertainty surrounding land tenure observed in this study mirrors findings that insecure land rights undermine community engagement and diminish the legitimacy of REDD+ initiatives. The financial vulnerabilities identified particularly reliance on short-term donor funding corroborate earlier assessments suggesting that REDD+ financing mechanisms remain structurally fragile and insufficient to sustain long-term forest conservation [26], [37]. Conversely, the positive outcomes in West Papua align with research emphasizing the central role of customary governance and local participation in enhancing the social acceptability and sustainability of REDD+ interventions, although this study also confirms concerns regarding persistent weaknesses in MRV systems that limit the credibility of emission reduction claims. Collectively, these findings reinforce the argument advanced in previous literature that REDD+ cannot succeed through a uniform national blueprint; rather, it must adopt flexible, context-sensitive governance reforms while addressing structural drivers of deforestation such as weak tenure systems, extractive economic incentives, and institutional capacity gaps [need citation]. This study thus contributes to the broader discourse by empirically illustrating how region-specific dynamics mediate REDD+ outcomes and by reaffirming the need for transformative, multi-level policy innovations to achieve durable climate mitigation impacts.

CONCLUSION

The findings of this study demonstrate that the overall effectiveness of REDD+ in Indonesia is fundamentally shaped by structural governance dynamics, clarity of land tenure arrangements, institutional readiness, financial continuity, and the degree of community participation, all of which interact to determine the durability and legitimacy of conservation outcomes. The divergent experiences of Central Kalimantan and West Papua illustrate that REDD+ cannot be expected to perform uniformly across regions: in Central Kalimantan, persistent fragmentation of authority, unresolved land tenure conflicts, and dependence on unpredictable donor financing have inhibited long-term program stability, whereas in West Papua, stronger customary land governance and deeper community engagement have generated higher levels of local ownership despite ongoing challenges in monitoring systems, coordination mechanisms, and sustainable funding. These

patterns collectively reveal that REDD+ is unlikely to achieve its intended climate mitigation and forest conservation goals without adopting a more adaptive, context-responsive policy architecture that strengthens institutional capacity, ensures legally secure and socially legitimate land rights, diversifies financial support, and embeds community led decision-making into the core of implementation. Unless such systemic constraints are addressed, REDD+ risks remaining a fragmented, project-based intervention rather than evolving into a transformative, integrated instrument capable of delivering sustained emission reductions and equitable socio-environmental benefits across Indonesia's diverse forest landscapes.

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AUTHORS CONTRIBUTIONS

Wally A. Sowe led the overall conceptualization and design of the study, including the formulation of research questions, development of the methodological framework, and integration of analytical components, while also taking primary responsibility for drafting, revising, and preparing the manuscript for submission. Ebrima Ceesay contributed to refining the methodological approach, particularly in strengthening the comparative case study analysis, synthesizing data, and interpreting the findings within the broader context of climate governance. Both authors collaboratively conducted the literature review, contributed to data interpretation, engaged in critical revisions of the manuscript, and approved the final version for publication.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article. All stages of research, from data collection to analysis and manuscript preparation, were conducted independently without any financial, commercial, or institutional influence that could be perceived as a potential conflict. The interpretations and conclusions presented in this study are solely those of the authors and do not reflect the views of any affiliated institution.

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