International Journal of Transdisciplinary Research and Perspectives
Volume 2, Issue 8, August 2026
www.ijtrp.com | E-ISSN: 3107-7935 | RESAIM Publishing | www.resaim.com

Forest Governance in Befale: Assets, Constraints, and Prospects

Baafo Nkong'oto Jean Marie[1*], Minga Milolo Stephane[2]
[1]Department of Waters and Forests, School of Telecommunication and Spatial Censure, Kinshasa, Democratic Republic of Congo
[2]Department of Spatial Physics, School of Telecommunication and Spatial Censure, Kinshasa, Democratic Republic of Congo

***Abstract*: Forest governance represents a major challenge for the Democratic Republic of Congo, especially in the territory of Befale, which is endowed with abundant natural resources yet faces significant socio economic and institutional constraints. This study analyzes the strengths, limitations, and prospects of local forest management through a documentary and analytical approach that integrates ecological data (NDVI, climate), legal texts, and institutional reports. The findings reveal substantial ecological potential, notably in relation to non-timber forest products and carbon sequestration, while also highlighting persistent challenges such as land tenure insecurity, weak enforcement of legal frameworks, and dependence on external funding. The discussion underscores the need to strengthen community land rights, promote agroforestry, and integrate Befale into international carbon credit mechanisms. The study concludes that Befale has the potential to serve as a pilot territory for reconciling conservation, development, and social equity, provided that governance becomes more inclusive and transparent.**

***Keywords*: Agroforestry, Carbon credits, Carbon sequestration, Community land tenure rights, Forest governance.**

1. Introduction

Forest governance in the Congo Basin is of global strategic importance, given its role as one of the largest reservoirs of biodiversity and carbon. In the Democratic Republic of Congo (DRC), forests cover more than 70% of the national territory, providing critical ecosystem services such as carbon sequestration, hydrological regulation, and biodiversity conservation (FAO, 2015; Democratic Republic of Congo,2002). Yet, the territory of Befale in Tshuapa province illustrates the paradox of ecological abundance coexisting with socio-economic precarity. Despite rich natural resources and indigenous knowledge, local governance remains fragile, institutional capacity weak, and communities marginalized (Rainforest Foundation UK, 2024; Majambu et al., 2019). This paradox – ecological wealth coupled with social precarity – raises fundamental questions about the capacity of forest policies to reconcile environmental sustainability with inclusive development (Mpoyi et al., 2026).

The central research question can thus be formulated as follows: *How can ecological and socio-cultural assets be mobilized to address institutional and socio-economic constraints, thereby enabling forest policies to reconcile environmental sustainability with inclusive development?*

A. Study Area

Befale, located in Tshuapa province (DRC), is characterized by a humid equatorial climate with annual rainfall exceeding 1,800 mm and stable temperatures between 23 °C and 27 °C (MEDD, 2024). The landscape of plateaus and valleys supports ferralitic soils, generally nutrient-poor yet favorable to forest regeneration (FAO, 2015). Dense humid forest dominates the vegetation, providing biodiversity and non-timber forest products essential to local livelihoods. Socio-economically, communities rely heavily on shifting cultivation, hunting, artisanal fishing, and fuelwood extraction, which intensifies ecological pressures and exposes weaknesses in local forest governance (Rainforest Foundation UK, 2024). The Lomako River and its tributaries form a vital hydrographic network, underpinning ecological regulation and community organization.

Figure 1 shows the location of the territory of Befale within Tshuapa province, showing administrative boundaries with neighboring territories, the hydrographic network structured by the Lulonga, Lopori, and Maringa rivers, and the internal division into three sectors (Befumbo, Duale, Lomako). These features highlight the forested and ecological character of the territory, essential for climate regulation and carbon sequestration.

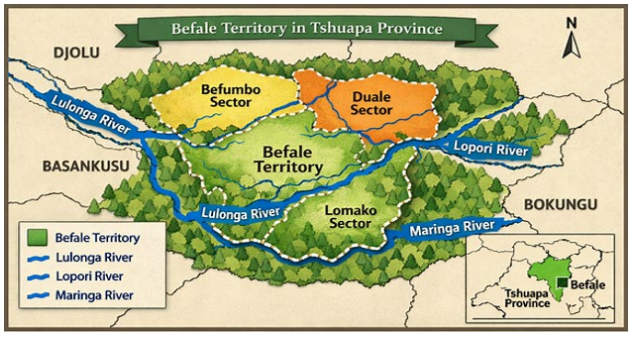

Fig. 1. Spatial organization of Befale territory

Figure 1 shows the geographical location of the territory of Befale within Tshuapa Province, its administrative boundaries

*Corresponding author: bankocml@gmail.com

with neighboring territories, and its hydrographic network structured by the Lulonga, Lopori, and Maringa rivers. It highlights the internal division into three sectors, Befumbo, Duale, and Lomako, which reflect the forested and ecological character of the territory, essential for climate regulation and carbon sequestration.

B. Objectives

- Assess Befale's ecological potential through NDVI, climate, and biodiversity data, focusing on carbon sequestration and non-timber forest products.
- Examine institutional and socio-economic constraints such as land tenure insecurity, weak law enforcement, and community dependence on forest resources.
- Explore strategies for inclusive and sustainable forest governance by strengthening community rights, promoting agroforestry, and integrating Befale into carbon credit mechanisms.

2. Methodology

This study draws on institutional documentary sources and scientific databases to analyze forest governance in Befale. Legal texts, including the DRC Forest Code and decentralization laws, together with reports from the Ministry of Environment and Sustainable Development, FAO, and CIFOR, provided the framework for examining governance policies. Demographic data from censuses, electoral files, and territorial reports were used to assess socio-economic dynamics and their impact on natural resources.

Spatial and climatic data were integrated through Landsat imagery (5 TM, 7 ETM+ and 8/9 OLI-TIRS) for the period from 1995 to 2025, processed via supervised classification to generate diachronic forest cover maps. Vegetation dynamics were evaluated using the Normalized Difference Vegetation Index (NDVI), an indicator of ecosystem health, deforestation, and regeneration. Climatic trends in rainfall and temperature were analyzed over three decades using statistical tests, including the Mann–Kendall test, to identify significant patterns and anomalies.

Socio-institutional data were coded and thematically analyzed to highlight strengths and weaknesses in the legal framework and public policies. Demographic trends were cross-referenced with ecological data to explore correlations between population growth, land pressure, and forest cover change. This integrated methodological approach links biophysical and institutional dimensions, providing a comprehensive basis for evaluating forest governance challenges and opportunities in Befale.

A. Theoretical Framework

The theoretical framework draws upon approaches to environmental governance and participatory management of natural resources. Forest governance is conceived as a multi-level system involving the state, local communities, private actors, and international organizations (Agrawal & Ostrom, 2001). The concepts of community land rights and environmental justice are central to understanding the tensions between economic exploitation and conservation.

Furthermore, the study is situated within the perspective of international mechanisms such as REDD+ and payments for ecosystem services (PES), which aim to valorize carbon sequestration and strengthen economic incentives for sustainable forest management (Angelsen et al., 2018). This framework enables the articulation of local dynamics in Befale with global challenges of forest governance and the carbon credit market.

3. Results

The findings highlight the complexity of forest governance in the territory of Befale, where significant ecological and economic assets coexist with persistent institutional and social constraints, alongside prospects for reform and integration into international mechanisms.

A. Assets

Befale possesses considerable ecological potential, characterized by dense humid forest rich in biodiversity and ecosystem services. Non-timber forest products (NTFPs) including fruits, mushrooms, honey, and medicinal plants constitute an essential source of income and subsistence for rural households (FAO, 2015). Moreover, the carbon sequestration capacity of these forests is estimated at several million tons of CO_2, offering economic opportunities through carbon credit mechanisms and payments for ecosystem services (Angelsen et al., 2018). These assets position Befale as a strategic territory for conservation and sustainable development.

B. Constraints

Despite this potential, forest governance in Befale faces multiple structural and institutional challenges. Land tenure insecurity, stemming from the overlap between customary rights and official titles, restricts community participation and exacerbates land-use conflicts (Agrawal and Ostrom, 2001). Rapid demographic growth increases pressure on agricultural land, driving the expansion of shifting cultivation and significant deforestation (Rainforest Foundation UK, 2024). Weak enforcement of forest laws, often hindered by limited institutional capacity and local corruption, further undermines governance (MEDD, 2024). Finally, dependence on external funding, particularly through REDD+ projects, compromises the sustainability of local initiatives and limits community autonomy (CIFOR, 2020).

C. Perspectives

Future prospects for forest governance in Befale rest on consolidating recent reforms and integrating into innovative financial mechanisms. The adoption of the Indigenous Peoples' Rights Law in 2022 and the review of forest concessions in 2024 strengthen community rights and pave the way for more inclusive management (MEDD, 2024).

In addition, international carbon markets and payments for ecosystem services provide opportunities for sustainable financing, potentially reducing reliance on traditional donors

Table 1
Main constraints and associated opportunities

Main Constraints	Associated Opportunities
Land tenure insecurity and land-use conflicts	Recognition of community rights (Law of 2022)
Demographic and agricultural pressures	Development of agroforestry and economic diversification
Weak enforcement of forest laws	Institutional reforms and review of concessions (2024)
Dependence on external funding	Integration into carbon markets and REDD+ mechanisms
Corruption and weak institutional capacity	Strengthening participatory and transparent governance

Table 2
Typology of actors, their functions, and degree of influence

Actors	Main Roles	Degree of Influence
Local communities	Customary land management, use of non-timber forest products	High at the local level
State (MEDD, territorial authorities)	Regulation, concession allocation, monitoring	High at the national level
NGOs and civil society	Advocacy, technical support, awareness-raising	Medium to high
International donors	Financing, project conditionality	High
Private sector	Forest exploitation, investments	Variable depending on regulation

(Angelsen et al., 2018). Integrating Befale into these mechanisms, combined with the promotion of agroforestry and economic diversification, could transform the territory into a pilot model of forest governance that reconciles conservation, development, and social equity.

Table 1 presents the constraints and opportunities associated with the main factors under study.

Forest governance in Befale faces structural challenges such as land tenure insecurity, demographic pressures, weak law enforcement, corruption, and dependence on external funding. At the same time, recent reforms, community rights recognition, institutional restructuring, and innovative mechanisms like carbon markets and REDD+ create opportunities for more inclusive and sustainable governance. Agroforestry and economic diversification further offer alternatives to resource-intensive practices, highlighting the potential to transform ecological assets into long-term socio-economic benefits. Table 2 illustrates the diversity of stakeholders involved in forest governance in Befale, highlighting their respective functions and the varying degrees of influence they exert at local, national, and international levels.

The table 2 displays the typology of actors involved, their functions, and their degree of influence in forest resource management, illustrating the complexity of the multi-level governance system. The figure 2 below displays the evolution of NDVI in the territory of Befale for the period of 1995 to 2025.

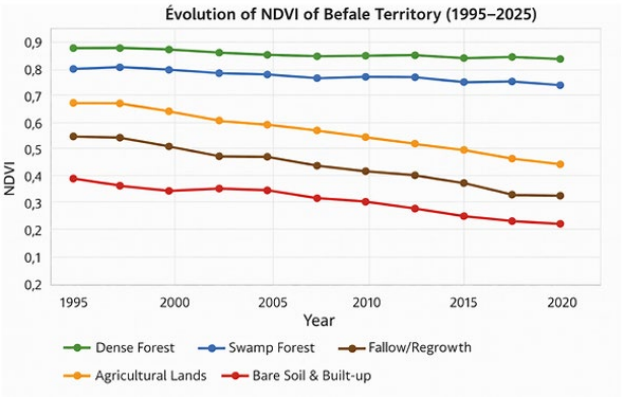

Fig. 2. Evolution of NDVI of Befale territory (1995-2025)

The figure 2 above illustrates the temporal evolution of the Normalized Difference Vegetation Index (NDVI) across five land-cover categories: dense forest maintains consistently high NDVI values, averaging 0.80-0.85, which reflects stable vegetation health and canopy integrity. Swamp forest shows moderate but relatively stable value around 0.60-0.65, indicating persistent humidity and resilience despite climatic variability. In contrast, regrowth/fallow land displays a gradual increase from 0.45 in the mid-1990s to 0.60 by 2025, suggesting progressive regeneration. Agricultural land remains at moderate levels, fluctuating between 0.25-0.35, consistent with seasonal cropping cycles and soil exposure. Finally bare soil and built-up areas persist at the lowest NDVI value, around 0.10-0.15, underscoring land degradation and reduced ecological function. Overall, the figure highlights the persistence of forest cover alongside growing anthropogenic impacts. The divergence between stable forest NDVI values and declining agriculture and bare-soil indices provides clear evidence of ecological change in Befale over the past three decades, with implications for carbon sequestration potential, forest governance and land-use planning.

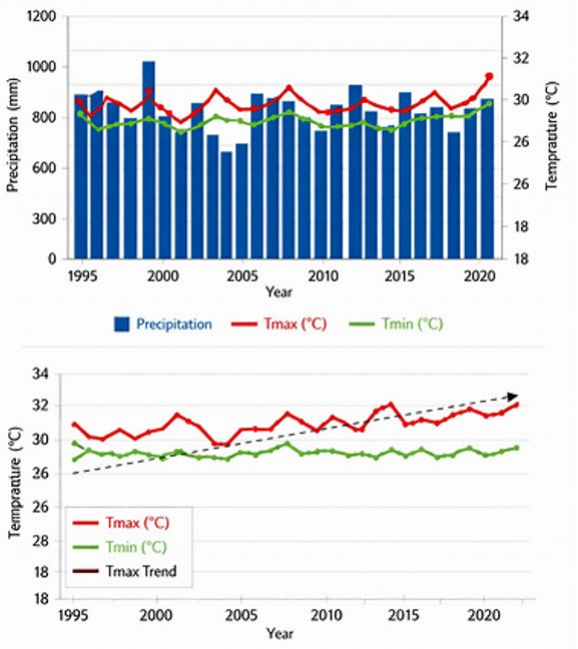

Fig. 3. Evolution of precipitations and temperatures annually

The figure 3 illustrates the annual evolution of precipitation and temperature averages in Befale from 1995 to 2025, highlighting long-term climatic variability across the study period.

The figure 3 reveals a moderate decline in annual precipitation after 2010, with mean annual rainfall dropping from around 1 950–2 100 mm in the late 1990s to approximately 1 600–1 750 mm after 2015. The driest years include 2011 (≈1 480 mm) and 2020 (≈1 550 mm), while the wettest peaks occur in 1997 (≈2 200 mm) and 2022 (≈2 300 mm).

In parallel, maximum temperatures (Tmax) show a gradual increase from an average of 29–30 °C in the 1990s **to** 32–34 °C after 2015, with extreme values reaching ≈40.6 °C in 2007 and ≈38.4 °C in 2024. Minimum temperatures (Tmin) remain relatively stable, fluctuating between 19–22 °C, confirming that warming is primarily driven by daytime extremes rather than nighttime conditions.

This divergence between rainfall and temperature trends indicates a progressive intensification of dry and warm conditions, which may contribute to reduced forest productivity and lower NDVI values. The upward trend in Tmax also points to increasing evapotranspiration stress, a factor that should be considered when assessing carbon sequestration potential and forest resilience in Befale.

The figure 4 presents the monthly evolution of precipitation and temperature averages in Befale from 1995 to 2025, illustrating the seasonal rhythm of rainfall and thermal variation characteristic of the equatorial climate.

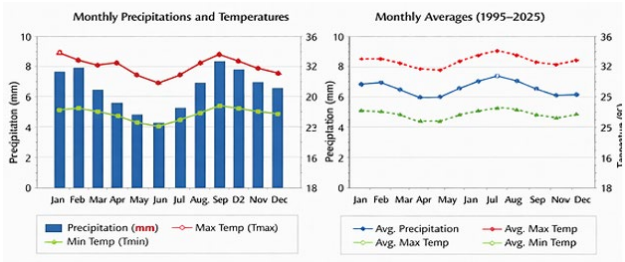

Fig. 4. Evolution of precipitations and temperatures monthly

The Figure 4 illustrates the monthly evolution of precipitation and temperature averages in Befale from 1995 to 2025, revealing the characteristic bimodal rainfall regime and thermal stability of the equatorial climate. Precipitation shows two distinct peaks: the first between March and May (≈ 6 mm) and the second between September and November (≈ 7–8 mm), with the maximum in October (≈ 8 mm). The driest months are January and July, each recording only ≈ 3 mm, marking transitional dry phases. In contrast, maximum temperatures (Tmax) fluctuate between ≈ 30 °C during wet months and ≈ 33–34 °C in March–April, preceding the onset of the main rainy season. Minimum temperatures (Tmin) remain relatively stable throughout the year, oscillating between ≈ 20 °C in December–January and ≈ 22 °C in April–May, indicating limited nocturnal variability. This seasonal interplay demonstrates that high temperatures precede rainfall peaks, promoting convective activity and defining the rhythm of Befale's tropical climate. The October precipitation maximum coincides with a slight decline in Tmax, reflecting the cooling effect of increased cloud cover and humidity. Overall, these monthly dynamics underscore the alternation of humid and dry phases, which directly influence forest phenology, NDVI fluctuations, and carbon assimilation cycles, essential for evaluating forest resilience and carbon credit reliability in the region.

The combined diachronic analysis of NDVI dynamics (figure 2) and climatic trends (figures 3 and 4) provides a comprehensive picture of ecological change in Befale over the past three decades.

Dense forest consistently sustains high NDVI values (≈ 0.80–0.85), while swamp forest remains moderately stable (≈ 0.60–0.65). In contrast, regrowth and fallow land shows gradual improvement from ≈ 0.45 to 0.60, agricultural land fluctuates at lower levels (≈ 0.25–0.35), and bare soil/built-up areas persist at the lowest NDVI (≈ 0.10–0.15), underscoring degradation. Climatic data reveal a decline in annual precipitation from ≈ 2 000 mm in the late 1990s to ≈ 1 600–1 750 mm after 2015, with extremes such as 2011 (≈ 1 480 mm) and 2022 (≈ 2 300 mm). Maximum temperatures (Tmax) rise from ≈ 29–30 °C in the 1990s to ≈ 32–34 °C after 2015, peaking at ≈ 40.6 °C in 2007 and ≈ 38.4 °C in 2024, while minimum temperatures (Tmin) remain stable (≈ 19–22 °C). Monthly averages confirm a bimodal rainfall regime, with peaks in March–May (≈ 6 mm) and September–November (≈ 7–8 mm), the maximum in October (≈ 8 mm), and dry phases in January and July (≈ 3 mm). Tmax reaches ≈ 33–34 °C in March–April, while Tmin oscillates between ≈ 20 °C in December–January and ≈ 22 °C in April–May.

Together, these results highlight the persistence of forest cover but also reveal intensifying climatic stress and anthropogenic pressures. The decline in rainfall, rise in Tmax, and NDVI reductions in agriculture and degraded lands point to increasing vulnerability of forest ecosystems. These findings provide critical evidence for understanding forest resilience, NDVI variability, and carbon sequestration potential, forming the empirical foundation for the subsequent discussion on governance and carbon credit valuation in Befale.

4. Discussion

The dynamics observed in Befale reflect broader pressures on Congo Basin forests, where demographic growth, agricultural expansion, and weak governance drive deforestation and declining vegetation health (CIFOR, 2020; Rainforest Foundation UK, 2024). Comparative evidence from Mai-Ndombe, Équateur, and Sangha provinces demonstrates both the scale of forest loss and the potential of targeted interventions. Projects such as REDD+ Era Congo and PIREDD have reduced deforestation, restored degraded lands, and generated social benefits, while regulatory enforcement in Sangha has curbed forest loss (FAO, 2023). Befale, however, remains disadvantaged by the absence of such structuring initiatives, limiting its capacity to reverse ecological decline.

International experiences highlight pathways for improvement. In the Brazilian Amazon, satellite monitoring

and payment for ecosystem services policies achieved an 84% reduction in deforestation between 2004 and 2012, though rates rose again under renewed economic pressures (INPE, 2013; INPE, 2020; Nepstad et al., 2014). In Indonesia, REDD+ programs reduced emissions by over 577 $MtCO_2eq$ and restored more than 2 million ha of degraded land, supported by results-based financing through the Green Climate Fund (UNFCCC, 2022; Ministry of Environment, Indonesia, 2021; UNDP, 2025). These cases underscore the importance of robust monitoring, institutional coordination, and sustainable financing.

For Befale, integration into international mechanisms such as REDD+ and carbon markets could yield comparable ecological and socio-economic benefits. Yet, governance challenges in the DRC limited enforcement of the Forest Code, corruption, and dependence on external donors raise concerns about sustainability and sovereignty (Ebuteli, 2024; IGF, 2022). Effective forest governance will require stronger collaboration among local institutions, communities, and international actors, grounded in transparency and accountability (Agrawal and Ostrom, 2001).

Finally, forest governance must be linked to social justice and local development. Recognition of community land rights and equitable benefit sharing are essential to reduce inequalities and strengthen cohesion (Larson & Ribot, 2007; Alden Wily, 2018). By embedding communities in decision-making and financing mechanisms, conservation can become a driver of inclusive development (Colfer, 2011; Sikor & Stahl, 2011). Befale thus has the potential to evolve into a model of environmental justice, reconciling ecological sustainability with socio-economic equity (Schlosberg, 2007; Sen, 1999).

5. Conclusion and Recommendations

The study conducted in the territory of Befale highlights the complexity of forest governance within the Congo Basin. Despite considerable ecological and economic potential exceptional biodiversity, high carbon stocks, and diverse non-timber forest products Befale remains constrained by persistent institutional and socio-economic challenges. Weak administrative capacities, land tenure insecurity, and dependence on external financing undermine the sustainability of local initiatives. Nevertheless, recent legal reforms and access to international carbon markets present unprecedented opportunities to transform Befale into a pilot territory capable of reconciling conservation, economic development, and social equity.

Operational recommendations for Befale focus on strengthening community land rights and promoting sustainable economic diversification. Land tenure security, grounded in the principle of free, prior, and informed consent (FPIC), is essential to ensure the legitimacy of communities in forest governance. Effective implementation of the 2025 land law and recognition of customary rights in public policies are critical levers for reducing land-use conflicts and fostering participatory resource management.

At the same time, the promotion of agroforestry and the integration of Befale into carbon credit markets represent strategic opportunities to align conservation with development. Agroforestry, combined with the valorization of non-timber forest products (NTFPs), can enhance household economic resilience while mitigating deforestation. Access to REDD+ mechanisms and payments for environmental services (PES) would enable the monetization of carbon sequestration and mobilize sustainable financing for conservation and local development.

The findings of this study open several avenues for future research. It would be relevant to deepen quantitative analyses of carbon sequestration at the local scale by integrating climate simulation models. Likewise, comparative studies of the socio-economic impacts of REDD+ projects across different territories of the Congo Basin would provide valuable insights into the conditions for success. Finally, exploring participatory governance mechanisms and environmental justice particularly in relation to the rights of Indigenous peoples would offer a robust foundation for designing inclusive and sustainable policies.

References

[1] A. Agrawal and E. Ostrom, "Collective action, property rights, and decentralization in resource use in India and Nepal," *Polit. Soc.*, vol. 29, no. 4, pp. 485–514, 2001.

[2] L. Alden Wily, "Recognition of customary tenure in Africa: An update and critique," *Land*, vol. 7, no. 2, Art. no. 40, 2018.

[3] A. Angelsen, C. Martius, V. De Sy, A. E. Duchelle, A. M. Larson, and T. T. Pham, *Transforming REDD+: Lessons and New Directions*. Bogor, Indonesia: CIFOR, 2018.

[4] CIFOR, "Deforestation and forest degradation in the Congo Basin: Drivers and policy responses," Center for International Forestry Research, Bogor, Indonesia, 2020. [Online]. Available: https://www.cifor.org

[5] CIFOR, *Governing the Forests: An Institutional Analysis of REDD+*. Bogor, Indonesia: Center for International Forestry Research, 2020.

[6] C. J. P. Colfer, "Marginalized forest peoples' perceptions of the legitimacy of governance: Exploring the link between legitimacy and resilience," *Forest Policy Econ.*, vol. 13, no. 4, pp. 255–262, 2011.

[7] Democratic Republic of Congo, *Code Forestier*. Kinshasa, DRC: Ministère de l'Environnement, 2002.

[8] Institut Ebuteli, "Rapport sur la gouvernance forestière en République Démocratique du Congo," Institut Ebuteli, Kinshasa, DRC, 2024. [Online]. Available: https://ebuteli.org

[9] Food and Agriculture Organization of the United Nations, *Global Forest Resources Assessment 2015*. Rome, Italy: FAO, 2015.

[10] Food and Agriculture Organization of the United Nations, *State of the World's Forests*. Rome, Italy: FAO, 2015.

[11] Food and Agriculture Organization of the United Nations, *State of the World's Forests 2023: Forests and Sustainable Development*. Rome, Italy: FAO, 2023. [Online]. Available: https://www.fao.org

[12] Inspection Générale des Finances, "Rapport annuel de l'Inspection Générale des Finances sur la gouvernance forestière en RDC," Inspection Générale des Finances, Kinshasa, DRC, 2022. [Online]. Available: https://igf.cd

[13] Instituto Nacional de Pesquisas Espaciais, "Monitoramento da Floresta Amazônica Brasileira por Satélite (PRODES)," INPE, São José dos Campos, Brazil, Tech. Rep., 2013.

[14] Instituto Nacional de Pesquisas Espaciais, "Relatório de desmatamento na Amazônia Legal," INPE, São José dos Campos, Brazil, Tech. Rep., 2020.

[15] A. M. Larson and J. C. Ribot, "The poverty of forestry policy: Double standards on an uneven playing field," *Sustain. Sci.*, vol. 2, no. 2, pp. 189–204, 2007.

[16] E. Majambu, S. M. Wabasa, C. W. Elatre, L. Boutinot, and S. Ongolo, "Can traditional authority improve the governance of forestland and sustainability? Case study from the Congo (DRC)," *Land*, vol. 8, no. 5, Art. no. 74, 2019.

[17] Ministère de l'Environnement et Développement Durable, "Rapport final de la Commission de revisitation des concessions forestières," MEDD, Kinshasa, DRC, Tech. Rep., 2024.

[18] Ministère de l'Environnement Indonésien, "National Forest Restoration Report," Government of Indonesia, Jakarta, Indonesia, Tech. Rep., 2021.
[19] Ministry of Environment, Indonesia, "Indonesia's REDD+ implementation progress report," Government of Indonesia, Jakarta, Indonesia, Tech. Rep., 2021. [Online]. Available: https://www.menlhk.go.id
[20] R. A. Mittermeier, N. Myers, J. B. Thomsen, G. A. B. da Fonseca, and S. Olivieri, *Megadiversity: Earth's Biologically Wealthiest Nations*. Mexico City, Mexico: CEMEX, 1997.
[21] C. Mpoyi, A. Maindo, V. Ingram, B. Kakelengwa, and P. Cerutti, "The politics of institutionalising multi-stakeholder platforms: Power relations and actors' interests in forest governance in the Democratic Republic of the Congo," *Int. Forestry Rev.*, vol. 28, no. 2, pp. 203–217, 2026.
[22] NASA, *Landsat Science Data User Handbook*. Washington, DC, USA: NASA, 2023.
[23] D. C. Nepstad, D. G. McGrath, C. M. Stickler, A. Alencar, A. A. Azevedo, B. Swette, and L. Hess, "Slowing Amazon deforestation through public policy and interventions in beef and soy supply chains," *Science*, vol. 344, no. 6188, pp. 1118–1123, 2014.
[24] Rainforest Foundation UK, "Analyse du rapport de revisitation des concessions forestières en RDC," RFUK, London, U.K., Tech. Rep., 2024.
[25] Rainforest Foundation UK, "Congo Basin forest governance report," Rainforest Foundation UK, London, U.K., Tech. Rep., 2024. [Online]. Available: https://www.rainforestfoundationuk.org
[26] Rainforest Foundation UK, "Forest governance and community rights in the DRC: Annual report," RFUK, London, U.K., Tech. Rep., 2024.
[27] D. Schlosberg, Defining Environmental Justice: Theories, Movements, and Nature. Oxford, U.K.: Oxford University Press, 2007.
[28] A. Sen, *Development as Freedom*. Oxford, U.K.: Oxford University Press, 1999.
[29] T. Sikor and J. Stahl, Forests and People: Property, Governance, and Human Rights. London, U.K.: Earthscan, 2011.
[30] United Nations Development Programme, "Green Climate Fund results-based payments for REDD+: Indonesia case study," UNDP, New York, NY, USA, Tech. Rep., 2025. [Online]. Available: https://www.undp.org
[31] United Nations Development Programme, "Results-based payments for REDD+ in Indonesia," UNDP, New York, NY, USA, Tech. Rep., 2025.
[32] United Nations Framework Convention on Climate Change, "Results-based payments for REDD+: Indonesia," UNFCCC, Bonn, Germany, Tech. Rep., 2022. [Online]. Available: https://unfccc.int