Africa's Future Climate Governance: Protecting Biodiversity Hotspots for Sustainability

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Kariuki Muigua*

Abstract

Biodiversity in Africa faces significant threats, primarily due to overexploitation, rapid population growth, and climate change, despite existing protective legislation. Key challenges include habitat loss, land-use modifications, and the introduction of non-native species. Conservation efforts often marginalize local communities, emphasizing the need for participatory governance to enhance community involvement and transparent benefit-sharing. As biodiversity is crucial for ecosystem services and sustainable development, Africa must establish strong institutional frameworks, enforce conservation policies, and engage in data collection and community awareness to sustainably utilize its rich biodiversity. Additionally, addressing climate change—one of the biggest threats to biodiversity—is essential, particularly as Africa is disproportionately affected despite its minimal contribution to global emissions. Effective climate governance is imperative for the conservation and sustainability of biodiversity hotspots.

This paper explores some of the major ways through which Africa can promote effective climate governance as a means of achieving biodiversity hotspots conservation for sustainability.

1. Introduction

Biodiversity faces global threats, particularly in Africa, due to overexploitation, even with existing legislation aimed at protecting natural resources and biodiversity.[1] Some biodiversity threats identified include exponential population growth, an increase in the rate of poverty, land-use modification and fragmentation, and the introduction of harmful non-native species.[2] Conservation authorities and private reserve owners have significant power in decision-making, often marginalizing local communities without formal land tenure.[3] Participatory

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[1] Okosodo, Ehi Francis, and Odangowei Inetiminebi Ogidi. "Biodiversity conservation strategies and sustainability." *Sustainable utilization and conservation of Africa's biological resources and environment*. Singapore: Springer Nature Singapore, 2023. 61-84.

[2] Ibid.; see also Schmeller, Dirk S., et al. "Building capacity in biodiversity monitoring at the global scale." *Biodiversity and conservation* 26.12 (2017): 2765-2790.

[3] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Frontiers in Sustainability* 6 (2025): 1601933

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governance aims to rectify this by promoting community representation, transparency in benefit-sharing, and mechanisms for grievance redress.[4]

Biodiversity is essential for providing ecosystem services that support life and contribute to sustainable development goals (SDGs). However, biodiversity and biodiversity-based ecosystems services are intrinsically dependent on the climate.[5]

Despite its rich biodiversity and numerous endemic species, Africa faces significant threats from human activities such as habitat loss, overexploitation, and climate change.[6] Rapid urbanization and population growth by 2050 will exacerbate pressures on biodiversity and natural resources, affecting vulnerable populations reliant on these resources.[7] To sustainably utilize biodiversity, Africa must establish strong institutional frameworks, enforce conservation policies, collect data on biodiversity status, raise awareness of its importance, and involve communities in conservation efforts. Mainstreaming biodiversity across all sectors is also crucial for long-term benefits.[8]

Climate change is considered as one of the biggest threats to biodiversity conservation. Climate change is the variation in the statistical distribution of average weather conditions over a prolonged period of time in any region of the world, where it reflects abnormal variations to the expected climate within the earth's atmosphere and subsequent effects on other parts of the earth.[9]

Climate change is a major challenge for humanity, particularly impacting Africa due to its low resilience and adaptive capacity. The interplay of various socio-ecological and economic stressors complicates the implementation of social justice principles in managing climate change.[10] However, the effectiveness of these principles in addressing climate change impacts remains limited due to insufficient socio-economic and natural adjustments to the adverse effects of climate change.[11]

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[4] Ibid.

[5] Sintayehu, Dejene W. "Impact of climate change on biodiversity and associated key ecosystem services in Africa: a systematic review." *Ecosystem health and sustainability* 4.9 (2018): 225-239.

[6] Saliu, Abiola Omolewa, et al. "The value of biodiversity to sustainable development in Africa." *Sustainable utilization and conservation of Africa's biological resources and environment*. Singapore: Springer Nature Singapore, 2023. 269-294.

[7] Ibid.

[8] Ibid.

[9] Ibe, G. O., and J. Amikuzuno. "Climate Change in Sub-Saharan Africa: A menace to Agricultural productivity and Ecological protection." *Journal of Applied Sciences & Environmental Management* 23.2 (2019): 329.

[10] Apraku, Amos, et al. "Managing climate change through social justice in Africa: Key lessons from the Libode area of Eastern Cape, South Africa." *Scientific African* 27 (2025): e02534.

[11] Ibid.

Africa, though contributing just 4% of global emissions, experiences significant climate impacts. The continent's natural landscapes offer key opportunities for mitigation through the protection and restoration of grasslands, forests, and coastlines, despite challenges from population growth and rising temperatures affecting land, water, and food resources.[12]

This paper explores some of the major ways through which Africa can promote effective climate governance as a means of achieving biodiversity hotspots conservation for sustainability.

2. Climate Governance: Meaning and Concepts

Climate change is primarily driven by factors such as rising temperatures, altered rainfall patterns, increased storm intensity, and the melting of glaciers. These changes lead to extreme weather events, reduced freshwater resources, threats to food security, and a decline in industrial production and infrastructure.[13] Additionally, climate change correlates with rising sea levels, ocean acidification, and heightened health risks through pest proliferation and disease spread.[14] The escalating population and industrialization contribute to greenhouse gas emissions, primarily from fossil fuels, deforestation, and biomass decay, resulting in higher atmospheric CO2 levels. As climate variability intensifies, adverse effects on human habitats and livelihoods are expected to exacerbate.[15]

The governance of climate change involves institutions, rules, and processes directing efforts to mitigate greenhouse gas emissions and adapt to climate impacts.[16] Key elements include multilateral agreements like the UN Framework Convention on Climate Change and the Paris Agreement, which set temperature goals and require governments to submit Nationally Determined Contributions.[17] Governance functions at multiple levels, encompassing international treaties, national laws, and local regulations, along with various policy frameworks such as carbon pricing and emissions trading. Recent developments emphasize the importance of credibility, enforcement, and integrating local actions into national strategies.[18]

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[12] Conservation International. "Africa Could Deliver Major Climate Gains by Protecting Nature, New Report Shows." Accessed November 18, 2026. https://www.conservation.org/press/africa-could-deliver-major-climate-gains-by-protecting-nature-new-report-shows.

[13] Ibe, G. O., and J. Amikuzuno. "Climate Change in Sub-Saharan Africa: A menace to Agricultural productivity and Ecological protection." *Journal of Applied Sciences & Environmental Management* 23.2 (2019): 329.

[14] Ibid.

[15] Ibid.

[16] Nature index, "Climate Governance and Policy Frameworks", < https://www.nature.com/nature-index/topics/l4/climate-governance-and-policy-frameworks> Accessed 18 November 2026.

[17] Ibid.

[18] Ibid.

Understanding the interaction between domestic politics, multilevel governance, and market mechanisms is vital for aligning policies with 1.5 °C and 2 °C targets and mobilizing finance for low-carbon development.[19]

Climate governance should involve collaboration among public officials, individuals, businesses, NGOs, and stakeholders.[20] It is often executed through Multilateral Environmental Agreements (MEAs) like the Paris Agreement or the United Nations Framework Convention on Climate Change (UNFCCC). However, many governments, despite having the necessary technology, expertise, and funding, lack the political will to meet climate and emissions targets.[21]

3. Understanding Climate Governance in Africa

Africa's biological and environmental resources are diverse but threatened by population growth and climate change. Intense poverty and food insecurity lead to resource overexploitation, while inadequate technical skills and unsustainable policies exacerbate environmental degradation.[22] Given the high variability of these resources, addressing Africa's biodiversity and environmental challenges necessitates a comprehensive approach that considers sociocultural, political, and economic factors.[23]

Climate change adversely affects biodiversity protection through aggravated weather conditions, increased temperature, increased land salinity, excessive rainfall, storms, hurricanes and tornadoes which climax in ecosystem ruin.[24]

The reality of climate change is rising among scientific and political circles, highlighting severe consequences for African societies and economies, especially rural communities.[25] These communities are particularly vulnerable due to their reliance on natural resources and a combination of social, economic, and environmental factors that exacerbate their exposure to

[19] Ibid.
[20] ClimateCheck. "Climate Governance for Corporate and Governmental Institutions." Accessed November 18, 2026. https://climatecheck.com.
[21] Ibid.
[22] Ogwu, Matthew Chidozie, Adams Ovie Iyiola, and Sylvester Chibueze Izah. "Overview of African biological resources and environment." *Sustainable utilization and conservation of Africa's biological resources and environment*. Singapore: Springer Nature Singapore, 2023. 1-31.
[23] Ibid.; see also Hambira, Wame L., et al. "Sub-Saharan Africa's Perspectives on Environmental Change and Biodiversity Conservation: An Introduction." *Environmental Change and Biodiversity Conservation in sub-Saharan Africa: Volume 1*. Cham: Springer Nature Switzerland, 2024. 3-17.
[24] Ibe, G. O., and J. Amikuzuno. "Climate Change in Sub-Saharan Africa: A menace to Agricultural productivity and Ecological protection." *Journal of Applied Sciences & Environmental Management* 23.2 (2019): 329.
[25] Ofoegbu, Chidiebere, et al. "Assessing vulnerability of rural communities to climate change: A review of implications for forest-based livelihoods in South Africa." *International Journal of Climate Change Strategies and Management* 9.03 (2017): 374-386.

climate change.[26] Consequently, climate change presents significant environmental, social, and economic challenges for African continent.[27] Sub-Saharan Africa is considered particularly highly vulnerable to global climate change due to inadequate adaptation capacity and a heavy reliance on agriculture, which is sensitive to climate factors such as temperature, rainfall, humidity, and extreme weather events.[28] Some authors have convincingly argued that croplands are regarded as the greatest threat to biodiversity across sub-Saharan Africa. As a result, they highlight the importance of mitigating the impacts of conventional commercial agriculture and incorporating biodiversity-positive elements of traditional smallholder farming systems.[29] These aims are arguably aligned with agroecological approaches promoted under the United Nations Convention to Combat Desertification and other global sus- tainability frameworks.[30]

Climate variability and change challenges are expected to manifest in various forms, which include changes in rainfall pattern and regime, and in the frequency and severity of extreme weather events such as drought and flooding.[31]

Studies have established that that the effectiveness and efficiency with which households adopt a coping practice is strongly linked to their socioeconomic and demographic characteristics.[32] The implication is that adaptation programmes that improve households' socio-demographic condition might be effective in improving rural communities' resilience to climate change challenges.[33] It has however been argued that the critical challenge that adaptation initiatives may have to deal with in these communities will be how to ensure that individuals and communities are able to sustain their adaptation after adaptation intervention has ended. To

[26] Ibid., p. 375.
[27] Ibid., p. 375.
[28] Ibe, G. O., and J. Amikuzuno. "Climate Change in Sub-Saharan Africa: A menace to Agricultural productivity and Ecological protection." *Journal of Applied Sciences & Environmental Management* 23.2 (2019): 329.
[29] Clements, Hayley S., et al. "A place-based assessment of biodiversity intactness in sub-Saharan Africa." *Nature* 649.8095 (2026): 113-121, p.119.
[30] Ibid., p.119.
[31] Ofoegbu, Chidiebere, et al. "Assessing vulnerability of rural communities to climate change: A review of implications for forest-based livelihoods in South Africa." *International Journal of Climate Change Strategies and Management* 9.03 (2017): 374-386.
[32] Ibid., p.381.
[33] Ibid., p.381.; see also Baradyana, Edson N., Kim Abel Kayunze, and Edwin Estomii Ngowi. "Socio-demographic determinants of climate change adaptation practices in agro-ecological zones: A case study of Chamwino and Igunga districts, Tanzania." *African Journal of Empirical Research* 6.2 (2025): 559-569; Tolulope, Olusanya Yetunde, et al. "Adapting to environmental changes and climate impacts in rural communities: A comprehensive review." *Global Journal of Earth and Environmental Science* 10.1 (2025): 1-7; Ahmed, Haseeb, Juan Sebastian Correa, and Nicholas J. Sitko. "Climate adaptation, perceived resilience, and household wellbeing: Comparative evidence from Kenya and Zambia." *Ecological Economics* 235 (2025): 108611.

this end, an understanding of the linkages between exposure to climate risk, household coping practices and adaptive capacity is imperative.[34]

It has been argued that to facilitate transformative climate governance, the main challenge will be to formalise the new governance capacities by strengthening those institutional, organisational and knowledge conditions that will allow to decisively prioritise long-term and integrated planning, align budgeting practices and procedures, mobilise broad alliances and partnerships for behavioural change, and to continuously learn and adapt to new knowledge and experimentation.[35]

4. The State of Africa's Biodiversity Hotspots: Challenges and Prospects

There is a significant relationship between human development and biodiversity in Africa, influenced by various drivers and feedback mechanisms.[36] Sustainable management requires investment in critical areas, focusing on biodiversity conservation under threats like climate change and deforestation. Most African biodiversity lies outside protected areas and faces increasing risks from development.[37] While biodiversity loss is driven biologically, it stems from socio-ecological and economic factors, including pollution and urbanization. Sustainable targets include public outreach on biodiversity loss, knowledge-based utilization, and innovative conservation practices integrated into future development plans.[38] Despite efforts to achieve sustainable development goals (SDGs), Africa still struggles with socio-economic development. Effective and efficient decision-making systems are essential for sustainable management of ecological systems to support this development.[39]

Governance and equity are essential for understanding conservation outcomes amid climate change, particularly in biodiversity-rich but economically marginalized areas. In these contexts, conservation models that exclude local communities exacerbate historical injustices.[40] Climate vulnerability transcends environmental factors, reflecting political

[34] Ibid., p.381.
[35] Hölscher, Katharina, and Niki Frantzeskaki. "Conclusions: Bridging and Weaving Science and Policy Knowledges for a Research Agenda to Transform Climate Governance." *Transformative Climate Governance: A Capacities Perspective to Systematise, Evaluate and Guide Climate Action* (2020): 447-476.
[36] Ogwu, Matthew Chidozie, Sylvester Chibueze Izah, and Adams Ovie Iyiola. "An overview of the potentials, threats and conservation of biodiversity in Africa." *Biodiversity in Africa: potentials, threats and conservation* (2022): 3-20.
[37] Ibid.
[38] Ibid.
[39] Kapinga, Kondwani, et al. "Ecological and social paradigm towards sustainability in the African context." *Advances in sustainable development and Management of Environmental and Natural Resources* (2021): 91-132.
[40] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Frontiers in Sustainability* 6 (2025): 1601933.

dimensions shaped by exclusionary governance.[41] A justice-oriented framework is crucial, emphasizing local perceptions of fairness and agency in biodiversity management, challenging the notion of biodiversity as solely an ecological issue.[42] Instead, it must be viewed within the governance structures that influence stakeholder engagement in natural resource management.[43]

Conservation areas, particularly private reserves, while ecologically and economically valuable, are often perceived as exclusionary by local communities due to non-transparent decision-making and limited access to land and sacred sites.[44] It has been argued that the primary concern is not only biodiversity loss or climate effects but rather how governance of these areas can either worsen or reduce inequality.[45]

5. Protecting Biodiversity Hotspots for Sustainability in Africa

Biodiversity loss, primarily due to human activities, poses significant threats to ecosystems, economies, and public health. It is crucial for ecosystem services that support human survival, with biodiversity loss jeopardizing crop yields and climate regulation.[46] Healthy ecosystems, rich in biodiversity, help regulate disease transmission, especially zoonotic diseases. To ensure sustainable health amidst biodiversity loss, a comprehensive approach that includes conservation efforts and policy interventions is vital.[47] Recognizing the connection between ecological health and human well-being is essential for effectively addressing these intertwined challenges.[48]

This section offers practical recommendations on how biodiversity hotspots can be addressed through effective climate governance in order to achieve sustainability.

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[41] Ibid.

[42] Ibid.; see also Martin, Adrian, Shawn McGuire, and Sian Sullivan. "Global environmental justice and biodiversity conservation." *The Geographical Journal* 179.2 (2013): 122-131; Ullah, Fazal, et al. "A framework for integrative socioecological conservation solutions." *Conservation Biology* 40.3 (2026): e70237; Wienhues, Anna. "The 'Global duties–local burdens problem'of just biodiversity conservation: Two perspectives on land and place-based values." *Ethics, Policy & Environment* 29.2 (2026): 197-220.

[43] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Op. cit.*

[44] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Frontiers in Sustainability* 6 (2025): 1601933.

[45] Ibid.

[46] Sharma, Ishani, and Santosh Birman. "Biodiversity loss, ecosystem services, and their role in promoting sustainable health." *The climate-health-sustainability nexus: understanding the interconnected impact on populations and the environment*. Cham: Springer Nature Switzerland, 2024. 163-188.

[47] Ibid.

[48] Ibid.

5.1. Investing in Community-Led Conservation Efforts

Conservation areas are vital for combating biodiversity loss and climate change, but their growth can lead to socio-economic conflicts with nearby communities, especially when governance practices exclude local input.[49]

Governance theory is critical for examining power dynamics in conservation areas. Challenges like elite capture and transparency issues hinder equitable participation. Although participatory governance promotes inclusivity and accountability, its practical application often falls short, particularly in private conservation.[50] This paper advocates for mechanisms such as co-management to empower local communities and share benefits more equitably. Despite legal frameworks supporting public participation, inconsistencies and exclusions remain, undermining efforts to achieve equitable conservation outcomes.[51]

Notably, the effectiveness of community-based conserved areas (CBCAs) in Sub-Saharan Africa in achieving biodiversity conservation and improving local socioeconomic well-being is affected by challenges which include unsustainable funding, increased poaching, habitat degradation, and limited community participation.[52] These issues arguably stem from power asymmetries and socio-political structures rather than mere technical failures.[53] As a result, for CBCAs to succeed, there must be inclusive governance and equitable resource distribution, addressing deeper systemic issues that influence conservation practices.[54]

5.2.Investment in Relevant Information and Data Collection on Biodiversity

Accurate biodiversity data are necessary for effectively monitoring and mitigating the existing rate of biodiversity loss.[55]

It has rightly been pointed out that although maintaining biodiversity is central to the sustainable development agenda, a lack of context-specific biodiversity information at policy-

[49] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Frontiers in Sustainability* 6 (2025): 1601933.
[50] Ibid.
[51] Ibid.
[52] Gayo, Leopody. "Community-based conserved areas in advancing sustainable development and conservation in Sub-Saharan Africa." *Discover Conservation* 2.1 (2025): 27.; see also Zvidzai, Mark, Peet van der Merwe, and Engelina du Plessis. "Paradigm shifts in the management of protected areas in southern africa: A narrative review." *Sustainable Environment* 11.1 (2025): 2556366.
[53] Ibid.; see also Galvin, Kathleen A., Tyler A. Beeton, and Matthew W. Luizza. "African community-based conservation." *Ecology and Society* 23.3 (2018).
[54] Ibid.
[55] Okosodo, Ehi Francis, and Odangowei Inetiminebi Ogidi. "Biodiversity conservation strategies and sustainability." *Op.cit.*

relevant scales has posed major limitations to decision-makers.[56] This has often caused efforts to achieve conservation goals to lag behind despite the fact that biodiversity is an integral part of sustainable development, resulting in rapid loss and failure to embed biodiversity management in policy and planning.[57]

It has been suggested that since monitoring biodiversity is time-consuming and expensive to replicate spatially and temporally, in the future, robotics and autonomous systems technologies combined with artificial intelligence (AI) could significantly facilitate data collection over large spatial and temporal scales by sensing, analysing and monitoring species' populations across all taxa.[58] It this end, it is believed that recent technological advancements offer potential solutions for fully automated monitoring of ecological communities through increasingly affordable high-throughput recording hardware, which can collect rich multidimensional data.[59] Furthermore, incorporating machine learning into ecological workflows could improve inputs for models and lead to integrated tools for wildlife conservation.[60]

However, it is essential to ensure that these technological advances are accessible to conservationists, are culturally sensitive and involve local communities to achieve sustainable and effective results.[61] To enhance the efficiency of such techniques, some experts call for the creation and funding of an integrated multidisciplinary task force and the development of education strategies to foster links between aspiring engineers, biologists and computer technologists which could be incorporated into school curricula and continued into university and research facilities and is particularly relevant for Africa.[62]

5.3. Adopting Innovative Education and Capacity Building for Future Generations

Climate change is a key focus of the United Nations' Sustainable Development Goal 13. Community engagement in climate adaptation and mitigation is vital for its success.[63]

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[56] Clements, Hayley S., et al. "A place-based assessment of biodiversity intactness in sub-Saharan Africa." *Nature* 649.8095 (2026): 113-121, p.113.
[57] Ibid., p. 113.
[58] Bezeng, Bezeng S., et al. "An African perspective to biodiversity conservation in the twenty-first century." *Philosophical Transactions of the Royal Society B: Biological Sciences* 380.1917 (2025), p.5.
[59] Ibid., p. 5.
[60] Ibid., p.5.; see also Tuia, Devis, et al. "Perspectives in machine learning for wildlife conservation." *Nature communications* 13.1 (2022): 792; Ullah, Fazal, Saddam Saqib, and You-Cai Xiong. "Integrating artificial intelligence in biodiversity conservation: bridging classical and modern approaches." *Biodiversity and Conservation* 34.1 (2025): 45-65; Oakley, George. "Machine Learning for Biodiversity Conservation: A Review of Ecological Monitoring, Species Prediction, and Conservation Applications." *International Journal of Applied and Natural Sciences* 4.4 (2026): 01-13.
[61] Ibid., p.5.
[62] Ibid., p.5.
[63] Chatanga, Redemption, and Maréve Biljohn. "Climate Governance: An Anatomy of Community Understanding and Awareness of Climate Change." (2024).

However, challenges may arise if communities lack understanding and awareness of climate change, as these factors significantly affect their participation.[64]

Conservation efforts in Africa must be community-led to ensure that those who incur costs and reap benefits are involved.[65] There is also an urgent need for training conservation scholars and practitioners, supported by mechanisms such as funding research at African universities and establishing research excellence centres.[66] It has however been argued that many African universities lack such mechanisms, resulting in limited contributions to global conservation knowledge.[67] Innovative funding solutions are essential to support researchers and practitioners directly. Additionally, African governments should reallocate budgets to enhance funding for tertiary education and postdoctoral fellowships to improve research productivity and innovation.[68]

For conservation initiatives to thrive, collective commitment and education are essential, particularly as effective training reduces habitat loss and enhances decision-making in conservation strategies.[69]

5.4. Enhancing and Expanding Protected Areas and Effective Foundational Legal Frameworks

It has been argued that the effectiveness of Africa's network of protected areas for biodiversity conservation is often questioned, as many were not originally established for this purpose.[70]

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[64] Ibid.

[65] Bezeng, Bezeng S., et al. "An African perspective to biodiversity conservation in the twenty-first century." *Op. cit.,* p. 5.

[66] Ibid., p.5; see also Onyancha, Omwoye B., Williams E. Nwagwu, and Tom Kwanya. "Knowledge mobilization for maximized research impact in centers of excellence in three countries in sub-Saharan Africa: Insights from content analysis." *Information Development* (2025): 02666669251336561; Sawyerr, Akilagpa. "African universities and the challenge of research capacity development." *Journal of Higher Education in Africa/Revue de l'enseignement supérieur en Afrique* (2004): 213-242; Leal Filho, Walter, et al. "The role of African universities in handling climate change." *Environmental Sciences Europe* 36.1 (2024): 130; Leal Filho, Walter, et al. "Reforming African universities for climate action." *Sustainability Science* 21.2 (2026): 893-898; Seiyaboh, E., and M. Raimi. "Leading for impact: strengthening university research management systems for academic excellence, innovation, and societal development." *Global J Enviro Sci Sustain* 2.2 (2026): 59-76.

[67] Ibid., p.5.

[68] Ibid., p.5.; see also Masaiti, Gift, and Damtew Teferra. "Funding research in African higher education." *Research and Innovation in African Higher Education: Trends, Challenges and Prospects*. Cham: Springer Nature Switzerland, 2025. 27-57; Stephen, Seyi, and Clinton Aigbavboa. "Enhancing academia–industry partnerships for sustainable building: a change framework for research and innovation integration in Sub-Saharan Africa." *Sustainability* 17.9 (2025): 3863; Igodo, Cynthia O. "Public Domain Patents and Innovation in Africa: Unlocking the Potential for Sustainable Development." *Intellectual Property Rights and Sustainable Development Goals in Africa*. CRC Press, 2025. 139-172; Tiffin, Nicki, et al. "Actionable approaches to empower African research & development." *Gates Open Res* 9.59 (2025): 59.

[69] Ibid., p. 6.

[70] Bezeng, Bezeng S., et al. "An African perspective to biodiversity conservation in the twenty-first century." *Op. cit.,* p. 6.

This is because threatened species and habitats are frequently outside these networks and thus, to address these gaps, frameworks identifying Key Biodiversity Areas (KBAs) and Other Effective Area-based Conservation Measures (OECMs) are necessary.[71] Arguably, KBAs support global biodiversity persistence, while OECMs conserve biodiversity outside protected areas. Connections between these areas, through wildlife corridors, are crucial.[72] Furthermore, increased political goodwill is needed for area-based approaches to enhance conservation efforts.[73] Legally enshrined governance frameworks are vital for garnering political support for the low-carbon transition and enabling policy implementation.[74] They create a platform for political debate, outline tools for establishing credible long-term goals and strategies, and specify transparency and monitoring mechanisms to improve accountability and compliance.[75]
In order to strike a balance, stronger institutional alignment is needed between private landowners and national biodiversity targets, particularly regarding biodiversity conservation and climate change laws.[76] While private reserves may access tax incentives and tourism marketing, they often lack oversight and community engagement.[77] This policy ambiguity presents a challenge and an opportunity to formalize equitable governance expectations and incorporate participatory mechanisms into the legal framework for private conservation efforts.[78]
It has even been argued that private reserves secure land, water and ecological resilience through capital-intensive adaptation strategies, while externalising climate risks to neighbouring, land-insecure communities. Conservation enclosures thus function as elite climate adaptation regimes rather than neutral land uses.[79]

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[71] Ibid., p.6.; see also Dong, Xuede, et al. "Integrating Key Biodiversity Areas into the global conservation network to advance area-based conservation targets." *Biological Conservation* 322 (2026): 112036; Langley, Joe Frederick, et al. "Key Biodiversity Areas and Important Plant Areas can help build ecologically representative Protected and Conserved Area networks to meet 30-by-30." (2025); Wensink, Catherine M., et al. "Other Effective Area-Based Conservation Measures (OECMs) in Global Area-Based Conservation." *Annual Review of Environment and Resources* 51.1 (2026): 521-549.
[72] Ibid., p.6.
[73] Ibid., p.6.
[74] Rüdinger, Andreas, et al. "Towards Paris-compatible climate governance frameworks." *An overview from recent research into 2050 climate laws and strategies, Studies* 04/18 (2018).
[75] Ibid.
[76] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Frontiers in Sustainability* 6 (2025): 1601933.
[77] Ibid.
[78] Ibid.
[79] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "Decolonising Enclosures: Climate Justice and Community Struggles around Privately Owned Conservation Landscapes in the Eastern Cape of South Africa." *Journal of Asian and African Studies* (2026): 00219096261437113.

There is a need to promote a more effective participatory governance which focuses on inclusive decision-making and accountability in environmental policy in order to eliminate inconsistent application, particularly in private conservation.[80] For processes to be participatory and result in efficient and effective climate action, people's rights and the regulations that protect them must be taken into account.[81] It is also vital that climate decisions and policies are sensitive to the perceptions, interests and rights of vulnerable populations.

This paper calls for mechanisms such as co-management approach in order to share power and acknowledge local communities' rights, interests and knowledge.[82] Successful co-management cases can lead to better benefit-sharing and less conflict, thus promoting equitable conservation efforts.[83]

5.5. Increased Funding Channels for Cutting-Edge Conservation Initiatives

Internationally, the Paris Agreement on climate change facilitates cooperation through enabling governments to establish individual commitments, with its success dependent on the faith of governments and investors in these commitments.[84]

It has rightly been pointed out that conservation funding in Africa has largely relied on external sources, necessitating new, sustainable funding routes for long-term biodiversity benefits.[85] Furthermore, research has established that there exists a gap in conservation research capacity, with African nations often lacking financial resources for necessary changes despite their rich biodiversity.[86] To address this, it has been suggested that innovative funding mechanisms such

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[80] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Op. cit.*

[81] UNDP, "Volume III: What is Climate Governance?" *Toolkit for Young Climate Activists in the Middle East and North Africa Region/Arab States Region*, <https://www.undp.org/sites/g/files/zskgke326/files/2022-09/Volume%20III%20What%20is%20climate%20governance.pdf> Accessed November 18, 2026.

[82] Maphosa, Mandlenkosi, Kablan Antoine Effossou, and Philani Moyo. "From symbolic inclusion to shared governance: contesting conservation in a climate-stressed South African landscape." *Op. cit.*

[83] Ibid.

[84] Victor, David G., Marcel Lumkowsky, and Astrid Dannenberg. "Determining the credibility of commitments in international climate policy." *Nature Climate Change* 12.9 (2022): 793-800.

[85] Bezeng, Bezeng S., et al. "An African perspective to biodiversity conservation in the twenty-first century." *Op. cit.,* p. 7.

[86] Ibid., p.7.; see also Ngongolo, Kelvin, and Moses Kyando. "Biodiversity conservation and socio-economic development for Africa's harmonious future: a scoping review." *BMC Environmental Science* 2.1 (2025): 11; News, Africa Science. "Africa's Research Gap Threatens Its Development Ambitions, Warns South African University Leader." *Africa Science News*, October 22, 2026. https://africasciencenews.org/2026/10/22/africas-research-gap-threatens-its-development-ambitions-warns-south-african-university-leader/; Eco-Business. "Rich Nations Failing to Deliver on Biodiversity Finance Pledges: Negotiator." Eco-Business, November 12, 2026. https://www.eco-business.com/news/rich-nations-failing-to-deliver-on-biodiversity-finance-pledges-negotiator/; European Chair for Sustainable Development and Climate Transition. "Breaking Barriers: Closing the Research Gap in Africa." Accessed November 18, 2026. https://www.sciencespo.fr/chair-sustainable-development/news/breaking-barriers-closing-the-research-gap-in-africa/.

as green finance, crowdfunding, and biodiversity offsets—are essential.[87] Current spending by African Union member states on conservation falls short of a previous commitment. Arguably, long-term financing can benefit both biodiversity and local communities through effective partnerships and revenue-sharing models.[88] However, with possible displacement of local communities, loss of livelihoods lost and minimal benefits reaching targeted communities, managing stakeholder expectations is imperative, as well as being sensitive to Indigenous Peoples and Local Communities, as situations vary between countries and projects.[89]

5.6. Need for Integration of Indigenous and Local Knowledge into Forward-Thinking Conservation Strategies

Indigenous peoples significantly contribute to climate change mitigation via indigenous sustainability, utilizing traditional knowledge systems to balance human needs with ecological preservation for current and future generations.[90]

In order to ensure a sustainable future for Africa, conservation stakeholders need to engage Indigenous Peoples and Local Communities by incorporating their rights, cultures, and sustainable practices.[91] Inclusion through free, prior, and informed consent (FPIC) is crucial for the success of conservation efforts. Collaborative agenda-setting with these communities promotes equitable governance and recognizes local experts who play a vital role in biodiversity conservation.[92]

Indigenous Peoples and Local Communities (IPLCs) are vital for biodiversity conservation, particularly with supportive legislation. Despite the benefits of integrating local ecological knowledge with scientific research, IPLC involvement is inconsistent in Africa.[93] Displacement for conservation often causes community resistance. However, training in

[87] Ibid., p.7.; see also Alam, Mehtab, and Sabeeh Ullah. "Greening the economy: Green finance and innovation nexus in developing countries." *Sustainable Futures* 10 (2025): 101448; Akomea-Frimpong, Isaac, et al. "Exploring the critical success factors on climate finance for sustainable infrastructure projects." *Engineering, Construction and Architectural Management* 33.15 (2026): 764-789; Raihan, Asif, and Tapan Sarker. "Financial mechanisms for advancing environmental sustainability: a comprehensive review." *Green Technology, Resilience, and Sustainability* 6.1 (2026): 4.

[88] Ibid., p.7.

[89] Ibid., p.7.

[90] Dube, Felix, and Aubrey Manthwa. "Putting people first in climate governance: The role of South Africa's indigenous values in securing ecologically sustainable development." *Climate change in Africa: adaptation, resilience, and policy innovations*. Cham: Springer Nature Switzerland, 2023. 237-253.

[91] Bezeng, Bezeng S., et al. "An African perspective to biodiversity conservation in the twenty-first century." *Op. cit.,* p. 7.

[92] Ibid., p.7.

[93] Ibid., p.7.

management practices can enhance land restoration and species diversity, providing advantages for both biodiversity and local communities.[94]

6. Conclusion

Governance, monitoring, and accountability have been considered to be critical enablers of effective conservation finance, ensuring transparency, inclusion, and long-term ecological outcomes.[95] Integrated approaches are essential to reconcile conservation and socio-economic development. This can be achieved through strengthening collaborative conservation strategies, adopting sustainable agriculture, and implementing targeted policies that support both ecological resilience and human well-being.[96]

Africa's biodiversity is under threat from rapid human population growth and unsustainable economic development, which is essential for the well-being of its society. There are notable gaps in conservation, especially facing climate change, but various initiatives aim to address knowledge gaps. Short-term priorities include establishing and managing protected areas, linking migratory corridors, and enhancing education and funding to meet global targets. Long-term solutions involve using technology such as robotics and AI, focusing on equity and inclusion in the Global South, and emphasizing youth and women's education and employment tied to local conservation. Local leadership in conservation practices is vital, alongside equitable support for African researchers in international efforts.

If Africa is to succeed in biodiversity conservation through the use of effective climate governance, then stakeholders have to ensure that they approach the subject through the eyes of the unique circumstances of the African continent in order to have everyone on board, including the communities that are most vulnerable to climate change effects.

[94] Ibid., p.7.

[95] Moleka, Pitshou. "Environmental Conflict, Resource Justice, and Community Resilience." *The Palgrave Encyclopedia of Sustainable Resources and Ecosystem Resilience*. Cham: Springer Nature Switzerland, 2026. 1-14.

[96] Ngongolo, Kelvin, and Moses Kyando. "Biodiversity conservation and socio-economic development for Africa's harmonious future: a scoping review." *BMC Environmental Science* 2.1 (2025): 11.

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