

Policy Insights

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Ecosystem-based Adaptation (EbA) for Disaster Risk Preparedness in Africa

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African perspectives
Global insights

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Executive summary

Climate disasters are expected to increase in both magnitude and frequency in Africa. However, despite the continent's vulnerability to climate change, disaster risk planning and response is severely underdeveloped. Governments lack the capacity and finance to respond appropriately and timeously to the onset of climate disasters, leaving many vulnerable people stranded without access to emergency services. Ecosystem-based disaster risk reduction (Eco-DRR) provides a unique opportunity to overcome this challenge by using nature to develop innovative, affordable and inclusive adaptation interventions, while enhancing biodiversity conservation and community livelihoods. However, the uptake of Eco-DRR in Africa is still well below what is required to meet the continent's climate and sustainable development goals (SDGs).

This policy insight identifies three opportunities for enhanced Eco-DRR uptake in Africa, namely 1) the alignment of climate, biodiversity and disaster risk policy at national and subnational levels, 2) the development of innovative, blended and scalable financing solutions, and 3) the strengthening and scaling of community-based natural resource management models.

Introduction

Despite contributing only 4% to total global emissions, Africa is one of the regions that is most vulnerable to climate change. Between 1970 and 2021, Africa accounted for 35% of climate-related fatalities, with only 40% of the population having access to early warning systems (the lowest rate of any region in the world).¹ Africa is also characterised by low levels of development, which exacerbates the region's vulnerability to climate change. According to the Intergovernmental Panel on Climate Change (IPCC), climate hazards in the region, such as droughts, floods and cyclones, are expected to increase in both frequency and magnitude in the future.² The majority of people in Africa are reliant on the natural resource base for their livelihoods. However, increased risk to climate change, overexploitation due to a lack of efficient natural resource governance and a lack of appropriate adaptation responses has resulted in a reduction in Africa's natural capital, worsening inequality and pushing many people further into poverty.

Financing for disaster risk response in Africa is well below the levels required. For example, a study of 16 African countries found that only four allocated more than 1% of their

1 World Meteorological Organisation, 'Early Warnings For All Action Plan for Africa is Launched,' Relief Web, September 6, 2023, <https://reliefweb.int/report/world/early-warnings-all-action-plan-africa-launched>.

2 Intergovernmental Panel on Climate Change (IPCC), "Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change," in Hans-O. Pörtner et al. (eds), *Climate Change 2022: Impacts, Adaptation and Vulnerability* (Cambridge: Cambridge University Press, Cambridge, UK and New York, USA).

national budgets to direct disaster risk reduction (DRR) investments.³ In this regard, limited financial resources for disaster risk response, as well as a lack of government capacity to respond appropriately to climate shocks, often leaves vulnerable people highly exposed to climate disasters.⁴

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There has been much evidence and support for the use of ecosystem-based adaptation (EbA) in DRR strategies, specifically in Africa. This is supported through global and regional policy frameworks such as the Paris Agreement under the UN Framework Convention on Climate Change, the Sendai Framework for Disaster Risk Reduction (2015–2030), the post-2020 Global Biodiversity Framework under the UN Convention on Biological Diversity (UNCBD), the Mauritius Declaration and Programme of Action for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 in Africa (in line of the Africa Regional Strategy for Disaster Risk Reduction 2008), the AU Climate and Resilient Development Strategy and Action Plan 2022–2032 and the AU Green Recovery and Action Plan 2021–2027. However, despite the recognition of Eco-DRR in policy, investments into Eco-DRR in Africa remain low. Innovative, blended and scalable financing solutions need to be developed to enhance the uptake of Eco-DRR, while also ensuring that policy development is aligned across climate, biodiversity and disaster risk response sectors. In addition, by developing sustainable and inclusive partnerships for on-the-ground implementation, there is potential to enhance Africa's disaster risk preparedness and simultaneously restore biodiversity and safeguarding of natural resource-based livelihoods.

Innovative, blended and scalable financing solutions need to be developed to enhance the uptake of Eco-DRR, while also ensuring that policy development is aligned across climate, biodiversity and disaster risk response sectors

3 UN Office for Disaster Risk Reduction, *Disaster Risk Reduction Investment in Africa – Evidence from 16 Risk-sensitive Budget Reviews* (Geneva: UNDRR, 2020). <https://www.undrr.org/publication/disaster-risk-reduction-investment-africa-evidence-16-risk-sensitive-budget-reviews>.

4 Dewald van Niekerk et al., *Regional Assessment on Ecosystem-based Disaster Risk Reduction and Biodiversity in Eastern and Southern Africa* (Nairobi: IUCN Eastern and Southern Africa Office, 2016). <https://www.preventionweb.net/publication/regional-assessment-ecosystem-based-disaster-risk-reduction-and-biodiversity-eastern>.

Ecosystem-based adaptation and ecosystem-based disaster risk reduction

EbA is the use of ecosystem services as part of an overall adaptation strategy for climate change.⁵ It involves the conservation and restoration of ecosystems. EbA can contribute to multiple co-benefits, including climate adaptation (and sometimes mitigation),⁶ socio-economic well-being and biodiversity conservation.⁷ EbA is often more cost-effective than hard engineering solutions. It requires a multi-stakeholder approach that frequently involves local communities who depend on natural ecosystems for their livelihoods. This makes EbA an attractive adaptation option for Africa.

Degraded and mismanaged ecosystems in climate-vulnerable areas are therefore key drivers of disaster risk

According to the UN Office for Disaster Risk Reduction, during the onset of climate disasters, disaster risk⁸ will be exacerbated by high exposure to the climate hazard, a high degree of vulnerability and low adaptive capacity. Degraded and mismanaged ecosystems in climate-vulnerable areas are therefore key drivers of disaster risk. For example, a lack of vegetation cover on slopes can result in mudslides during flooding, which causes damage to key infrastructure and loss of lives. Through targeted EbA interventions for disaster risk reduction, otherwise known as Eco-DRR, ecosystems are managed and conserved in a way that reduces people's vulnerability to climate disasters. Eco-DRR often involves combining disaster risk reduction strategies, such as early warning systems and emergency planning, with EbA interventions to inform more coordinated and effective climate change response strategies.⁹ Ecosystems can also provide vital services during climate disasters, including supporting the provision of water, food and shelter. It is necessary to understand this interconnectedness between EbA and DRR in the context of Africa's climate resilience planning.

5 Secretariat of the Convention on Biological Diversity, *Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change*, Technical Series 41 (Montreal: Secretariat of the Convention on Biological Diversity, 2009). <https://www.cbd.int/doc/publications/cbd-ts-41-en.pdf>.

6 If EbA involves the restoration of ecosystems that act as carbon sinks, for example mangroves, then EbA will contribute toward enhanced mitigation as well.

7 Hannah Sack, "A Regional Assessment of Marine and Coastal EbA in SADC", (Special Report, Johannesburg: South African Institute of International Affairs, 2023).

8 The UNDRR defines disaster risk as 'the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined as a function of hazard, exposure, vulnerability and capacity'.

9 UN Office for Disaster Risk Reduction, *Ecosystem-based disaster risk reduction: Implementing nature-based solutions for resilience* (Bangkok: UN Office for Disaster Risk Reduction- Regional Office for Asia and the Pacific, 2020). <https://www.undrr.org/publication/ecosystem-based-disaster-risk-reduction-implementing-nature-based-solutions-0>.

Practical examples from the Africa region

It is important to note that Eco-DRR can be used to mitigate a range of climate disasters. However, it requires clear policy guidelines, effective participatory approaches, strong institutional arrangements and sustainable financing mechanisms to ensure effective implementation. To better understand how Eco-DRR can enhance disaster risk preparedness and climate adaptation, two practical examples from the region related to specific climate hazards are outlined below.

Mountain restoration in response to landslides and flooding in eastern Uganda

In 2010 and 2018, severe landslides in the Bududa District of eastern Uganda caused mass devastation to several villages, clinics and schools, killing a total of 308 people.¹⁰ The landslides occurred because of degraded forest cover on Mount Elgon, which local communities relied on for the use and sale of timber. This also caused tensions between the Ugandan Wildlife Authority (UWA), which is tasked with managing conservation and tourism in the Elgon National Park, and local communities who advocated the right to access the mountain's natural resources. In response to the growing tensions and increased risk of landslides, local community member Irene Walimab founded AW Bamboo Enterprise Ltd in 2012, with the aim of using bamboo to restore the mountain and stabilise the slopes, while also providing alternative livelihood options for local communities through the use and sale of bamboo products. In 2021, a memorandum of understanding between the UWA and the Bududa District was signed, which allowed AW Bamboo Enterprise Ltd to use the park for the cultivation of bamboo and livelihood activities.¹¹ Currently, more than 500 women, including youth, are involved in the restoration and livelihood activities. These activities have expanded to include the cultivation of coffee and other crop varieties. Community members are also being trained in various activities related to bamboo cultivation and climate change through a partnership with the International Bamboo and Rattan Organization (INBAR).

Mangrove restoration in response to cyclones in the South-West Indian Ocean

Many people in Africa live along the coast, often in poorly built homes, in overcrowded communities, with little protection from coastal storms. In recent years, increased intensity and frequency of cyclones has caused much devastation to countries in the South-West Indian Ocean and surrounding inland countries. For example, between

10 Global Center on Adaptation, *Stories of Resilience: Lessons from Local Adaptation Practice* (Rotterdam and Cape Town: Global Center on Adaptation, 2023). <https://gca.org/reports/stories-of-resilience-lessons-from-local-adaptation-practice/>.

11 Global Center on Adaptation, "Stories of Resilience".

February and March 2023, Cyclone Freddy resulted in many deaths, the displacement of people and severe damage to infrastructure across Malawi, Mozambique, Madagascar, Zimbabwe and Mauritius.¹² In Mozambique alone, the onset of Cyclone Idai and Cyclone Kenneth in 2019 resulted in 603 deaths and 1 641 injuries, leaving 2.5 million people in need of humanitarian services.¹³ As a response measure to the increased risk of cyclones, the government, in collaboration with development partners, has been restoring and protecting mangroves. Mangroves act as natural barriers against the onset of coastal flooding, while providing other co-benefits such as carbon sequestration and breeding grounds for fish. It has been estimated that a 500m-wide mangrove forest can reduce wave heights by between 50% and 100%. Without their current presence, more than 18 million people globally would be flooded every year.¹⁴

Figure 1 Community mangrove restoration in the Limpopo estuary, Mozambique



Mangrove restoration in the Limpopo estuary in Mozambique

[image courtesy of Celia Macamo on behalf of Jacinta Laissone Ministry of Land, Environment and Rural Development, National Agency for Environmental Quality Control]

12 Aimée-Noël Mbiyozo and Ottilia Anna Maunganidze, 'Is Cyclone Freddy's record-breaking devastation the new normal?' *ISS Today*, March 30, 2023.

13 UNICEF, 'Cyclone Idai and Kenneth cause devastation and suffering in Mozambique,' Cyclone Idai and Kenneth, <https://www.unicef.org/mozambique/en/cyclone-idai-and-kenneth>.

14 MW Beck et al., *The global value of mangroves for risk reduction. Summary Report*. (Berlin: The Nature Conservancy, 2018).

As part of the [Coastal City Adaptation Project](#), funded by the US Agency for International Development (USAID), the mayor of the port city Quelimane has been overseeing the restoration of mangroves, supporting the establishment of an emergency management and risk reduction committee in each neighbourhood, and educating communities about the importance of mangroves in reducing disaster risk. Reflecting on the project, Mayor Manuel de Araújo stated that ‘the day the city doesn’t have mangroves is the day that the city won’t survive’.¹⁵ In 2022, the government launched the Mangrove Reforestation Plan in collaboration with the United Arab Emirates-based company, Blue Forest. Innovative satellite and artificial intelligence (AI) technologies are being used to detect where mangroves are being destroyed. This informs policy development and the tailoring of restoration activities. The government has adopted the [National Mangrove Strategy 2020–2024](#) and has since achieved 80% of its target of restoring 5 000ha of mangroves.

Opportunities for enhanced Eco-DRR uptake in Africa

Aligning climate, biodiversity and disaster risk policy

Eco-DRR cuts across multiple sectors and affects a range of stakeholder groups. Therefore, to ensure its effective implementation and ownership of its uptake, it is essential that climate, biodiversity and disaster risk policies are aligned. Such policies should include targeted and time-bound Eco-DRR interventions. By identifying synergies across different policies, policy alignment can help increase coherence, efficiency and effectiveness in policy implementation. This could lead to improved socio-economic outcomes.¹⁶ Alignment also requires coordination and collaboration among different government ministries. For example, disaster management units often do not sit within ministries of environment, which creates a need to formalise cross-sectoral and inter-ministerial coordination, monitoring and reporting for Eco-DRR. Kenya has been successful in aligning its national policy frameworks under the Paris Agreement, Sendai Framework for Disaster Risk Reduction and 2030 Agenda for Sustainable Development.¹⁷ For example, the government has developed Sustainable Development Goal indicators that feed into policy processes for climate, disaster risk reduction and sustainable development. A National Platform for Disaster Risk Reduction also assists in ‘coordination, prioritization and generating coherence between disaster risk reduction, adaptation and development issues’.¹⁸ Alignment at subnational levels is important, given that Eco-DRR is often implemented and overseen by local government and/or local communities. However,

15 Adela Suliman, ‘Mangroves and mapping help Mozambique tackle climate change,’ *Thomson Reuters Foundation*, May 4, 2018.

16 Angie Dazé, Anika Tertton and Malte Maass, ‘Alignment to Advance Climate-Resilient Development OVERVIEW BRIEF 1: Introduction to Alignment’, NAP Global Network, August 2018.

17 Deborah Murphy, ‘Alignment to Advance Climate-Resilient Development COUNTRY CASE STUDY: Kenya’, International Institute for Sustainable Development, October 30, 2019.

18 Murphy. ‘Alignment to Advance Climate.’

in Africa, there is a lack of frameworks to guide local government in integrating Eco-DRR across departments, while also aligning local policies to that of national development goals.¹⁹

Alignment is important to ensure African countries are supporting the implementation of regional policy commitments that speak to the importance of Eco-DRR initiatives. This will also ensure the successful implementation of initiatives such as the Great Green Wall²⁰ and the Great Blue Wall,²¹ which call for the use of nature-based solutions to enhance climate and disaster resilience in Africa's regional zones.

Developing innovative, blended and scalable financing solutions

Research shows that the costs of disasters to gross domestic product (GDP) in developing countries can be 20% greater than that of developed countries.²² However, financing for adaptation and DRR is well below the volumes required, specifically in Africa. In addition, a lack of budgeting for DRR in national accounting processes impedes African governments' ability to provide emergency services at the onset of climate disasters. Thus, not only do developing countries lack access to available funding for disaster risk management, but the costs of climate disasters are often too great for countries respond to appropriately and timeously. Recent global developments have sought to address the need for immediate financial assistance in the aftermath of climate disasters for vulnerable countries. This is most notable through the operationalisation of the much-anticipated Loss and Damage Fund at COP28.²³ The fund is meant to provide immediate financial support to developing countries experiencing devastation from climate change that cannot be avoided through either mitigation or adaptation. While the fund saw over \$700 million in commitment at COP28, this covers only 0.2% of the irreversible losses incurred developing countries as a result of climate change.²⁴ In addition, the decision to host the fund at the World Bank has raised concern regarding the influence of Western interests in distributing the funds.

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19 Ephias Mugari and Nthaduleni Samuel Nethengwe, 'Mainstreaming Ecosystem-Based Disaster Risk Reduction: Towards a Sustainable and Just Transition in Local Development Planning in Rural South Africa,' *Sustainability* 14, no. 19 (2022): 1–15.

20 The Great Green Wall initiative aims to restore 100 million hectares of currently degraded land; sequester 250 million tonnes of carbon and create 10 million green jobs by 2030 across the Sahel.

21 The Great Blue Wall Initiative aims to achieve 30% protection of the Western Indian Ocean by 2030 through nature-based recovery efforts and the development of a connected network of regenerative seascapes.

22 Christo Coetzee et al., 'Financing Disaster Risk Reduction: Exploring the Opportunities, Challenges and Threats Within the Southern African Development Community,' *International Journal of Disaster Risk Science* 14 (2023): 398–412.

23 UN Climate Change, 'Fund for responding to Loss and Damage', <https://unfccc.int/loss-and-damage-fund-joint-interim-secretariat>.

24 Nina Lakhani, '\$700m pledged to loss and damage fund at Cop28 covers less than 0.2% needed', *The Guardian*, December 6, 2023.

As such, in Africa, there is a need for disaster risk financing to be channelled towards prevention measures that could lower the overall costs needed to rebuild infrastructure and provide relief to affected communities. Eco-DRR provides a unique opportunity for DRR financing: it is often cost-effective, requires smaller amounts of funding than hard engineering solutions, provides socio-economic benefits to communities and has the potential to be scaled across national boundaries. For example, forest and mangrove restoration programmes hold the potential to generate carbon credits that can be sold on the voluntary carbon market, with profits being channelled back to community members. The Mikoko Pamoja project in Kenya has generated \$143 976 through the sale of carbon credits from mangrove restoration to date. This finance is channelled back to community members through a community development fund which has provided water for 4 500 community members and education for 700 school children.

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Eco-DRR can also be implemented alongside other disaster risk prevention strategies, such as the development of early warning systems. In East Africa, the World Food Programme is implementing Forecast-based Financing (FbF) approaches. These approaches aim to connect early warning systems to anticipatory finance and pre-agreed anticipatory actions to ensure the lives and livelihoods of affected communities are safeguarded when disasters strike.²⁵ For example, in Ethiopia the development of an FbF model, in collaboration with the government and development partners, enabled the disbursement of cash transfers to 2 925 pastoral households at risk due to severe drought between March and July 2021. Early warning information was also disseminated to affected communities, giving them time to plan ahead of the anticipated drought. Integrating investments in Eco-DRR alongside approaches such as FbF and early warning systems has the potential to further increase the resilience of affected communities that rely directly on natural resources for their livelihood. Thus, blended financing mechanisms for DRR should be prioritised.

²⁵ World Food Programme. [Forecast-based Financing in Eastern Africa: An anticipatory approach to climate emergencies](#). September 17, 2021.

Empowering communities through inclusive natural resource management models

Eco-DRR must be implemented in consultation with local communities that rely on the natural resource base for their livelihood. Often, top-down management approaches are met with resistance from local communities, especially if the regulations enforced by government authorities restrict community rights to land tenure and access to natural resources. Implementing community-based natural resource management (CBNRM) models has the potential to scale Eco-DRR in areas where it is most needed, while reducing capacity burdens on local government who often lack the ecological and Indigenous knowledge of local communities. In Madagascar, locally managed marine areas (LMMA) have been established. Local coastal communities are granted governance rights over marine areas and are capacitated for sustainable fisheries and natural resource management. The LMMAs operate under a customary law known as *dina*, which is formally recognised by the Malagasy government. They have established a coastal community network, Mihari, to facilitate lesson- and best practice-sharing between the over 200 established LMMAs.²⁶ With technical support from a non-government organisation (NGO) based in the UK, Blue Venture, the Velondriake LMMA has implemented the world's largest community-led mangrove restoration project, showcasing the effectiveness of CBNRM for scaling Eco-DRR.

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In Malawi, the second phase of the Sustainable Management of Indigenous Forest Project which aimed to capacitate local communities for sustainable forest management and development of alternative livelihoods based on non-timber forest products, was launched in 2008. Forests are vital to safeguarding surrounding communities from disaster risks by stabilising soil and preventing erosion or landslides as a result of flooding, for example. The project aided communities in the establishment of alternative livelihoods to timber harvesting for income, such as beekeeping, rearing guineafowl, processing indigenous fruit, bamboo furniture making and briquette making. In addition, communities actively protected naturally growing trees through establishing woodlots on locally owned land. By diversifying the income streams of local communities, the project

²⁶ Hannah Sack, "A Regional Assessment".

ensured that, at the onset of disasters, communities' livelihoods were safeguarded. This project was also implemented in Namibia, Botswana and Mozambique, showing the potential for CBNRM models to be scaled across national boundaries.²⁷

Conclusion

Africa's vulnerability to climate change calls for the need to develop innovative, affordable and inclusive climate adaptation interventions that have the potential to be replicated and scaled. Eco-DRR provides a unique opportunity for developing such initiatives in ways that also contribute toward sustainable development and enhanced community livelihoods. Several challenges, however, inhibit the uptake of Eco-DRR across the continent. Such challenges include a lack of integration of Eco-DRR in relevant policy processes; misalignment of climate, biodiversity and disaster risk reduction policies at national and subnational levels; insufficient financing in terms of access and affordability for developing countries; and a lack of consideration for local communities, indigenous knowledge in project design and implementation. Several African countries, however, have made progress in this regard, as the need to develop inclusive and sustainable adaptation strategies becomes increasingly urgent. To further enhance the uptake of Eco-DRR in Africa, cross-sectoral collaboration within government needs to be promoted, as well as cooperation between national and subnational departments. There is a need to enhance relationships between local disaster response units and local NGO conservation groups.²⁸ Blended financing solutions that support disaster risk preparedness can help reduce the costs incurred as a result of climate disasters that will inevitably increase in both magnitude and frequency on the continent. Ultimately, Eco-DRR seeks to increase the climate resilience of the most vulnerable communities while safeguarding natural resources, lowering costs of disaster risk responses, and contributing to sustainable development in line with the UN 2030 Agenda for Sustainable Development and the AU's Agenda 2063.

27 Dewald van Niekerk et al., "Regional Assessment on Ecosystem".

28 Emmanuel Tolulope Busayo et al., 'Rediscovering South Africa: Flood Disaster Risk Management through Ecosystem-Based Adaptation,' *Environmental and Sustainability Indicators* 14 (2022): 100175. <https://doi.org/10.1016/j.indic.2022.100175>.

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