

# INTEGRATED COMMUNITY- AND ECOSYSTEM-BASED APPROACHES TO CLIMATE CHANGE ADAPTATION

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## EXECUTIVE SUMMARY

Global climate change is an unprecedented threat in human history; one that will unfold over a long timescale, unevenly, in a non-linear fashion, and unpredictably. In response there is increasing focus on programming and policies that promote transformative and incremental adaptation and enhance resilience to climate change. Emerging approaches that build the resilience of socio-economic and ecological systems, including through community-based sustainable management of natural resources, are gaining recognition as viable tools for climate change adaptation and mitigation. These integrated ecosystem- and community-based solutions present African decision makers with new opportunities to plan for an uncertain future, using frameworks that include the most vulnerable people and important ecosystems. For their effective implementation, policymakers need a clearer understanding of how these initiatives function, ways to measure their effectiveness and scale them up, and a stronger quantitative evidence base to demonstrate their benefits.

## INTRODUCTION

Notwithstanding the climate change commitments made under the landmark [Paris Agreement](#) in 2015, there is still a significant gap between political

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ambition and practical reality – especially in light of the overall aim of keeping the average rise in global temperature to below 2°C, compared to pre-industrial levels. This means that there will still be significant climate impacts on vulnerable people, particularly women, as well as on natural resources, species and ecosystems, further reducing opportunities for sustainable development and exacerbating poverty, especially in the developing world. As such, adaptation to climate change has been a central component of the international negotiations of the [UN Framework Convention on Climate Change](#) since 2007, with the Paris Agreement placing adaptation issues on par with mitigation. The majority of national climate plans submitted in advance of Paris – known as [Nationally Determined Contributions \(NDCs\)](#) – include not only countries’ plans to reduce emissions but also descriptions of their adaptation goals, priorities, actions and financial needs. These objectives are also echoed in other international frameworks, such as the [2030 UN Sustainable Development Goals](#), the [Strategic Plan for Biodiversity 2011–2020](#) and the [Sendai Framework for Disaster Risk Reduction \(2015–2030\)](#).

Adaptation policy architecture has evolved over time, with a significant shift in focus from the traditional approaches, which emphasised maintaining the status quo, towards more dynamic and integrative strategies. Initially, climate change adaptation focused on conventional, incremental approaches to climate risk, often centred on biophysical vulnerability, hard infrastructure-based responses and top-down management. Today, adaptation approaches also consider the social and economic drivers of risk, as well as other factors not directly related to climate. Furthermore, adaptation is viewed as a process to address vulnerability, including the means to support livelihood resilience, maintain the integrity of ecosystems and their services, and build the capacity of those most vulnerable. Newer adaptation approaches encourage the inclusion of broader development goals, hoping to better capture the complex interdependencies between human societies and their environment. While engineered and technological adaptation options are still common, there is growing recognition of ecosystem-based, institutional and social measures to promote integrated adaptation. Emerging approaches also seek to empower local people and support bottom-up, participatory decision-making and planning, within a stronger institutional context.

## THE EMERGING ADAPTATION DISCOURSE

Despite a growing body of literature and a wide range of emerging assessments and screening tools to help identify and prioritise the most vulnerable communities, ecosystems, geographical areas and sectors, adaptation thinking is still evolving. Building adaptive capacity and promoting resilience in vulnerable communities is a long-term, cyclical process that generally consists of a mixed portfolio of interventions (described below), applicable to unique geographical and societal contexts. Because adaptation options differ by context, the [fifth assessment report of the Intergovernmental Panel on Climate Change](#)<sup>1</sup> suggests that there are various ‘entry points’ to address adaptation.

- **First entry point:** Addressing concerns of human security, poverty alleviation, livelihood security, disaster risk management and ecosystem management. This involves system-based, spatial or land-use planning, or the development

of coping mechanisms such as weather-based insurance schemes and early warning systems for weather events.

- **Second entry point:** Addressing climate change impacts through incremental adjustments to institutions, social systems and physical structures. This may include projects such as building walls along vulnerable coastal areas, or institutional or regulatory changes to support resilience policy formulation. Incremental adaptation accounts for actions where the central aim is to maintain the essence and integrity of a system or process at a given scale.
- **Third entry point:** Changing the fundamental attributes of a system in response to the climate and its effects.<sup>2</sup> This transformative adaptation requires broad-based change through social and technical innovation; the formation of new structures or systems of governance; or alterations in personal belief systems that inform climate change responses. This systemic approach encourages sustainable development trajectories that combine adaptation and mitigation co-benefits.

Within this broader debate, two emerging approaches to adaptation have gained traction: community-based adaptation (CbA) and ecosystem-based adaptation (EbA). CbA focuses on empowering local communities to reduce their own vulnerabilities, while EbA looks at harnessing ecosystems to provide goods and services in the face of climate change. These approaches are based on the premise that sound development and good governance, coupled with access to and the ability to use reliable information on climate risks, are prerequisites for adaptation and resilience-building. CbA and EbA work towards addressing the shortcomings of the mainstream, top-down, hard infrastructure-based approach to adaptation, seeking a balanced and integrated framework to reflect local conditions and community priorities. While there is no ‘one-size-fits-all approach’, a symbiotic approach that empowers local communities to manage ecosystems under resilient governance arrangements is a good development practice.

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## ECOSYSTEM-BASED ADAPTATION TO CLIMATE CHANGE

EbA is ‘the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change’.<sup>3</sup> This is based on the recognition that well-managed, diverse and healthy ecosystems provide multiple benefits to society (such as carbon storage and pollination services) with specific adaptation enhancement.

The benefits of integrating EbA into climate change policy and risk management are recognised at both international and national levels. For example, the [Sendai Framework for Ecosystem-based Disaster Risk Reduction](#), the [Cancun Adaptation Framework](#)<sup>4</sup> and the [Nairobi Work Programme](#) all underline natural resources’ centrality to effective adaptation strategies. Significant work has already been undertaken by the UN Convention for Biological Diversity to link national adaptation, biodiversity planning and action processes. EbA is also central to development approaches taken by other organisations, including the World Bank and the [International Union for Conservation of Nature](#).<sup>5</sup>

In addition, many country strategies and sector-based policies recognise the important role that ecosystems play in resilience building. In African countries,

EbA is most commonly applied in the agricultural and forestry sectors, and there are multiple references in [national adaptation programmes of action \(NAPAs\)](#) and [NDCs](#)<sup>6</sup> to conservation, sustainable management and the restoration of ecosystems.<sup>7</sup> For example, in semi-arid pastoral communities in South Africa's succulent Karoo eco-region, projects focus on the [rehabilitation of critical rangelands and wetlands through improved land management techniques](#). Madagascar is promoting sustainable livelihoods and management practices through permanent vegetation cover and 'intensive rice system' techniques, to reduce the vulnerability of smallholder farmers to severe weather events, while the Philippines is [conserving and restoring coastal vegetation](#) in abandoned fishponds to help reduce the vulnerability of communities to flooding, increase tourism income and provide critical habitats for fisheries. All these approaches seek to improve ecosystem functionality.



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Mangrove planting and restoration in Gazi, southern Kenya. Mangroves produce many ecosystem services that contribute to coastal community livelihoods through improved fisheries, water filtration, carbon sequestration and natural barriers to storms. To withstand climate change, the integrity of mangrove systems must be protected and maintained

## COMMUNITY-BASED ADAPTATION TO CLIMATE CHANGE

CbA is a human rights-based approach to development that targets the most vulnerable people and involves them in all levels of adaptation planning and implementation. In many cases this includes women from least developed countries. While the discipline of CbA may seem relatively new, it builds on a long history of development approaches, including efforts to incorporate natural resources governance. CbA characterises the design of most disaster risk-reduction



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A Ugandan farmer plants crop varieties that are climate smart

and community-based natural resource management initiatives. Capturing communities' traditional knowledge and experience, and merging this with modern technical knowledge and capacities, can be a valuable way in which to respond to climate variability and change. After all, communities have been adapting to changes in climate for centuries, through migration, changes in their choice of crop varieties, livestock decisions, etc.

CbA is community-led; that is, based on communities' priorities, needs, knowledge and capacities.<sup>8</sup> It typically entails projects aimed at enhancing livelihood resilience (promoting, for example, hardier seed varieties, drip irrigation, expanded access to weather forecasting services, or income diversification); strengthening the capacity of local civil society and government institutions so that they can more effectively support community adaptation efforts; and increasing social mobilisation, to address the underlying causes of vulnerability.<sup>9</sup>

The International Institute for Environment and Development's Smallholder Innovation for Resilience projects in Kenya, India, China and Peru have shown that small-scale farmers use indigenous knowledge – or bio-cultural innovation – to preserve genetic diversity. This, in turn, significantly enhances productivity and resilience to climate change and water scarcity.<sup>10</sup>

In the Potato Park near Cusco, Peru, for example, Quechua communities collectively manage an indigenous territory of over 9 000 ha, based on ancestral strategies of varietal diversification. Similarly, in Guangxi province in south-west China communities have used participatory plant breeding to develop drought-tolerant landraces of maize, rice and wheat, thereby strengthening food and seed security in harsh mountain areas. Genetic diversity and indigenous knowledge are important measures in a changing climate and should be supported by community seed banks, community-led landscape management and participatory plant breeding.

## INTEGRATING ADAPTATION APPROACHES

Historically, CbA has been championed by development practitioners and EbA by conservation practitioners, who have differing values, institutional agendas and funding sources. Yet adaptation experts have noted that there is substantial conceptual overlap between these two approaches and in practice they are often indistinguishable from one another.<sup>11</sup> [Good EbA approaches complement CbA](#) as they are people-centred, participatory and culturally appropriate. Genuine CbA should also consider ecosystems and natural solutions. The differences between these two approaches merely relate to their original objectives (to enhance livelihoods or to improve ecosystem functionality). The artificial separation between community-based and ecosystem-based approaches to adaptation is therefore misleading. Development-oriented organisations are increasingly integrating the two approaches within climate change adaptation policy, planning and implementation, building on the strengths of both approaches to address the shortcomings of mainstream, top-down strategies.

According to the [Ecosystem and Livelihoods Adaptation Network \(ELAN\)](#), integrating these approaches has numerous advantages. For instance, EbA practitioners can learn how to better incorporate socio-economic complexities within vulnerability assessments; build on the priorities and capacities of local people; identify and validate traditional knowledge; strengthen the social aspects of their monitoring, evaluation and reporting (MER) systems; and ensure that interventions build rather than undermine social capital. Meanwhile, by incorporating elements of EbA, development practitioners focusing on communities can learn how to better respect ecological complexity; incorporate ecosystem goods and services in community-led adaptation strategies; adapt management systems to ecosystem or landscape scales; build environmental integrity into MER systems; and ensure that interventions build rather than undermine natural capital. By reducing environmental degradation it is also possible to minimise some of the indirect negative socio-economic impacts of climate change.<sup>12</sup>

## BUILDING THE IMPACT CASE FOR CBA AND EBA INITIATIVES

Both CbA and EbA are relatively new disciplines and more analytical rigour is needed in terms of assessing their impact, measuring and evaluating their merits and limitations, and understanding the circumstances under which they thrive. While some anecdotal evidence corroborates the effectiveness of these approaches, there is a need for more quantitative, cost-benefit analysis on the multitude of social, economic and environmental co-benefits that result from effective CbA and EbA.<sup>13</sup> In the African context in particular, it is necessary to evaluate and communicate the developmental outcomes of these approaches with an emphasis on issues that have ‘political currency’, such as poverty reduction, economic benefits and employment.<sup>14</sup>

More attempts must be made to develop a network of practitioners to evaluate, synthesise and share successful adaptation strategies and experiences. It is also necessary to build the capacity for such strategies to be assessed and implemented at national and sub-national levels; and advance policies and knowledge-sharing platforms that allow effective strategies to be scaled up. [ELAN](#)<sup>15</sup> attempts to address

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this evidence gap by undertaking case studies to capture the lessons emerging from EbA and CbA experiences worldwide.<sup>16</sup> Although all adaptation efforts take place in very specific contexts, these studies highlight common political, policy and institutional conditions that maximise the uptake of EbA and CbA. At the local level, this evidence can help build capacity and assist people to implement transformational adaptation on the ground. At a national level, it may encourage the integration of these approaches into the wider policy discourse and help increase funding for EbA and CbA programmes and initiatives.<sup>17</sup>

Many proponents of CbA have a long history of implementing natural resource management projects, such as community-based forest management; rangelands, water and fisheries management; and conservation agriculture. Yet older disciplines, such as community-based natural resource management (CBNRM), can also help inform EbA and CbA practice and policymaking through lesson sharing.<sup>18</sup> Although CBNRM was initially seen as a response to biodiversity loss,<sup>19</sup> it has evolved to include rural development co-benefits. Now it is viewed as an institutional development programme whereby local communities are economically empowered through the sustainable use and management of natural resources. As it developed, CBNRM processes and institutions were established to promote community empowerment and ownership. This included the creation of mechanisms, laws and policies to enhance the direct and practical involvement of communities, such as devolving rights and management authority from the central government to communities; and establishing mechanisms to ensure that communities receive tangible benefits from conservation initiatives. Central to this is engagement with legitimate local institutions that incorporate traditional forms of governance.

Like CBNRM, CbA and EbA must address the broader institutional, governance and policy context in which initiatives operate, as their ultimate success is likely to hinge on this context. This is true both at the local level – where capable local institutions are needed to make decisions and ensure active community participation – and at the higher level, as these are the institutions and policies on which communities depend. CbA does not mean that there is no role for higher-level institutions, or that useful interventions cannot be made by national or district-level institutions. The main consideration is that the initial impetus – the starting point – must be the community. While CbA is grounded in community values and decision-making structures, it cannot operate exclusively at the local level. External factors, such as an unsupportive policy environment, affect communities' vulnerability to climate change. Specific actions are also required to facilitate effective responses, including effective support from and cooperation with relevant government departments. Yet evidence on how adaptation interventions contribute to or are supported by particular policies is weak and more research is needed in this domain.

A key challenge for CbA and EbA initiatives, many of which are localised project- or programme-based activities, is securing impact at wider scales. Even those initiatives that do work closely with governments often lack the multi-sectoral engagement at higher levels needed to maximise impact. Extending beyond the project scale requires embedding activities in an enabling institutional and policy framework that facilitates their replication in different contexts, across multiple scales. For CBNRM this has meant embedding local institutions in a broader

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institutional and policy framework that supports the devolution of rights to communities. This approach allows replication and diversification to other sectors. Systematically mainstreaming local adaptation approaches into local, regional and national government planning processes and policies is a good way to achieve impact at scale.<sup>20</sup>

Lessons from CBNRM also illustrate the importance of communities' receiving incentives or benefits from a system that aims to encourage behavioural change. For CBNRM, the long-term, non-monetary benefits from sustainable resource management had to be complemented with tangible, direct household benefits, which incentivised sustainable behaviour. CbA and EbA practitioners need to consider incentives for the adoption of adaptive practices, especially as compensation for short-term losses in periods of major uncertainty. In this regard, more research is needed to explore options in national and international adaptation microfinance, payments for environmental services and revolving funds.

MER is crucial in an iterative adaptation process. It can assist in understanding progress and performance, capturing and communicating lessons, and informing future policy and practice. However, the complexity of climate change adaptation and related interventions requires a modified approach to MER, as implementers need to demonstrate how their policy or programme contributes to an overall adaptation process that is largely shaped by external factors, at different scales. Climate change is a long-term process that stretches far beyond the span of traditional programme management cycles. The real impact of interventions may not be apparent for decades, and it is therefore difficult to define and measure achievements. Moreover, many aspects of adaptation and resilience building are 'soft' and qualitative assessments are often more appropriate.

## CONCLUSION

Many more organisations are now taking an integrated approach to CbA and EbA. Together, ecosystem- and community-based solutions to climate adaptation and vulnerability equip decision makers with new choices and options, allowing them to plan for an uncertain future. If their core principles are respected, these approaches, when combined, will promote resilient ecosystems using nature-based solutions to provide benefits to people, especially the most vulnerable. CbA and EbA encourage participatory, transparent, accountable and culturally appropriate solutions to climate adaptation, while actively embracing equity and gender issues.

However, much like other approaches, a key challenge in their implementation is a lack of understanding of their relative effectiveness vis-à-vis conventional alternatives. In order to ensure policy buy-in, it is necessary to improve the evidence base related to their cost-effectiveness and impact, and securing impact at scale. In addition, EbA and CbA must operate at scale. This can be achieved through mainstreaming them into government processes within regional, national and local climate and development planning. Both of these approaches should therefore be clearly reflected in national adaptation frameworks (with their principles applied in the existing country NAPAs and NDCs) and in the strategies of the AU and regional development communities. Other opportunities for scaling up EbA and CbA can be found in mainstreaming, replication and diversification within other sectors and



within other organisational approaches. For example, CbA components should be integrated into the major [EbA decision support frameworks](#) of the UN Environment Programme and other development and humanitarian organisations. Resilience building is also a priority for other regional and multilateral processes, and is a key concern in the wider donor community, the private sector and development practitioners at large.

These adaptation approaches must build on lessons and experiences from older disciplines such as CBNRM and disaster risk management, informed by the institutional, governance and policy context in which these initiatives operate. MER is one of the most promising approaches for documenting and disseminating what works, especially when knowledge is shared between and across adaptation projects and programmes, and between stakeholders and cross-sectoral partnerships.

## ENDNOTES

- 1 IPCC (Intergovernmental Panel on Climate Change), *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, 2014, <http://www.ipcc.ch/report/ar5/wg2/>, accessed 13 June 2017.
- 2 *Ibid.*
- 3 CBD (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', CBD Technical Series, 41, 2009, <https://www.cbd.int/doc/publications/cbd-ts-41-en.pdf>, accessed 19 July 2017.
- 4 UNFCCC (UN Framework Convention on Climate Change), 'Report of the Conference of the Parties on its Sixteenth Session, held in Cancun from 29 November to 10 December 2010', Decision 1/CP.16, <https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>, accessed 19 July 2017.
- 5 Crooks S *et al.*, 'Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shore Marine Ecosystems: Challenges and Opportunities', Marine Ecosystem Series, 121. Washington, DC: World Bank Environment Department, 2011.
- 6 A recent International Institute for Environment and Development (IIED) study showed that 109 of 162 Nationally Determined Contributions incorporated ecosystems in their vision for adapting to climate change impacts. See IIED, 'Ecosystem-based Adaptation: A Win-Win Formula for Sustainability in a Warming World?', Briefing, July 2016, <http://pubs.iied.org/pdfs/17364IIED.pdf>, accessed 19 July 2017.
- 7 This includes references to common concepts such as shade management, live barriers, conservation tillage and traditional agroforestry systems (which include programmes for reducing emissions from deforestation and forest degradation).
- 8 Reid H *et al.*, 'Community-based adaptation to climate change: An overview', *Participatory Learning and Action*, 60, 2009, p. 13.
- 9 Dodman D & D Mitlin, 'Challenges for community-based adaptation: Discovering the potential for transformation', *Journal of International Development*, 25, 5, 2013, pp. 640–659.
- 10 IIED, 'SDG2: Achieving Food Security, Sustainability and Resilience using Genetic Diversity and Indigenous Knowledge', Briefing, December 2016, <http://pubs.iied.org/pdfs/17410IIED.pdf>, accessed 19 July 2017.
- 11 Reid H, 'Ecosystem- and community-based adaptation: Learning from community-based natural resource management', *Climate and Development*, 8, 1, 2016.
- 12 Girot P, Ehrhart C & J Oglethorpe, 'Integrating Community and Ecosystem-Based Approaches in Climate Change Adaptation Responses', ELAN (Ecosystem and

- Livelihoods Adaptation Network), March 2014, [http://careclimatechange.org/files/adaptation/ELAN\\_IntegratedApproach\\_150412.pdf](http://careclimatechange.org/files/adaptation/ELAN_IntegratedApproach_150412.pdf), accessed 19 July 2017.
- 13 Doswald N *et al.*, 'Effectiveness of ecosystem-based approaches for adaptation: Review of the evidence-base', *Climate and Development*, 2014.
  - 14 Although CbA and EbA are relatively new disciplines, both build on historical community and ecosystems governance initiatives, and on traditional practices.
  - 15 Network partners include the IIED, the UN Environment Programme's World Conservation Monitoring Centre (UNEP-WCMC), Birdlife International and the University of Cambridge, working together to assess existing evidence for EbA and CbA in order to influence policymakers.
  - 16 The 'Ecosystem-based approaches to adaptation: strengthening the evidence and informing policy' project, implemented by the IIED, International Union for Conservation of Nature and UNEP-WCMC.
  - 17 Jeans H *et al.*, 'The role of ecosystems in climate change adaptation: Lessons for scaling up', in Schipper ELF *et al.* (eds.), *Community Based Adaptation to Climate Change: Scaling It Up*. London: Routledge, 2014, pp. 253–265.
  - 18 Reid H, 2016, *op. cit.*
  - 19 Some interventions claim to be CbA projects but in reality are traditional CBNRM projects. Development projects are re-branded as CbA without addressing the underlying drivers of climate-related risk or contributing to significantly reduce the vulnerability of communities.
  - 20 Also important to consider is the inclusion of institutions operating at the ecosystem level (eg, the transboundary watershed management scale).

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