



Indicators to measure the adaptation outcomes of ECOSYSTEM-BASED ADAPTATION

What is Ecosystem-based adaptation?

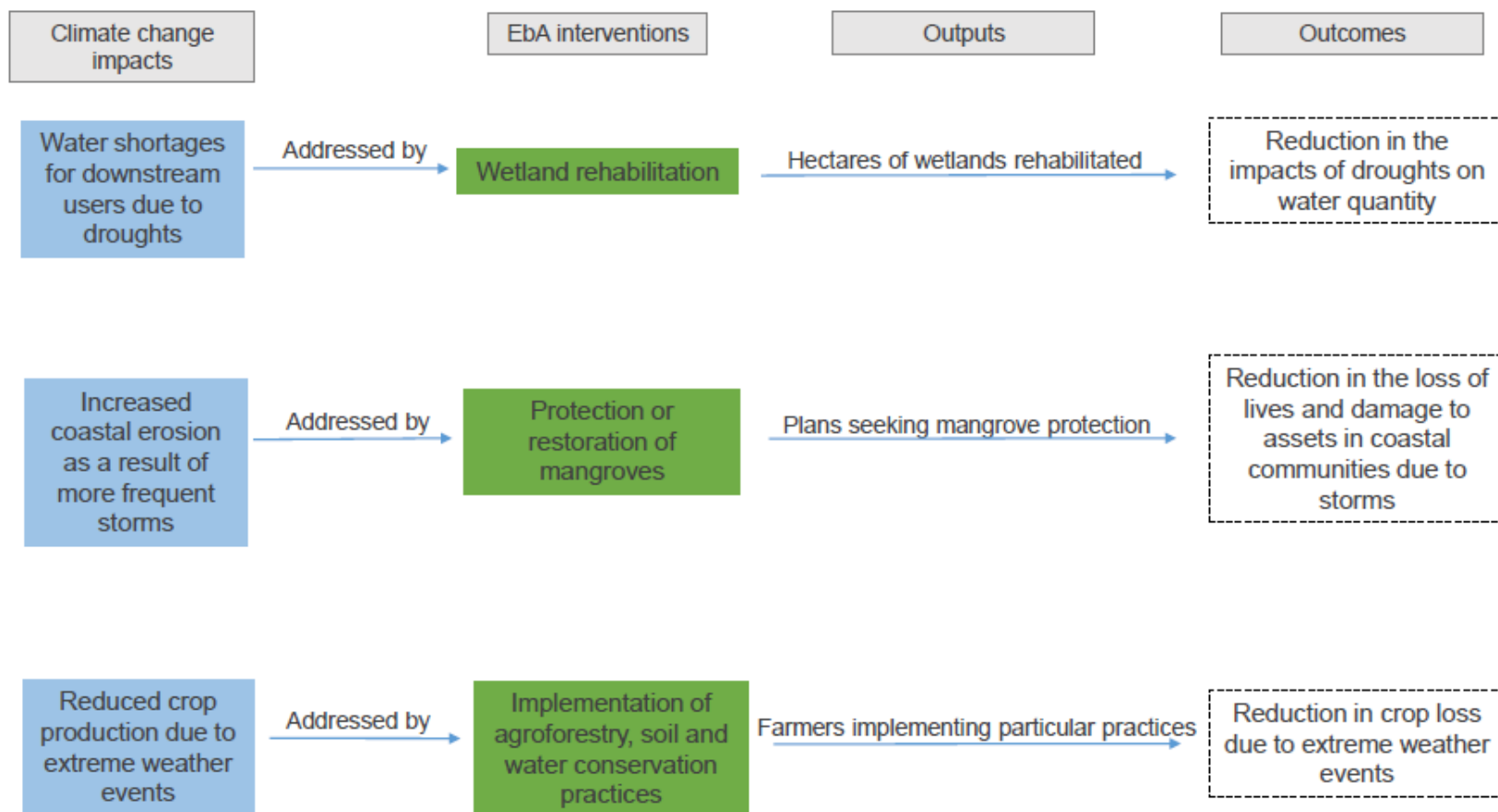
- Ecosystem-based adaptation (EbA) is “the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change” (CBD 2009¹). It includes the conservation, restoration and sustainable management of ecosystems and biodiversity to address climatic risks.
- EbA interventions are part of a broader portfolio of adaptation actions to reduce climate vulnerabilities and enhance the adaptive capacity of people.
- Examples of EbA interventions include the conservation of mangroves to protect people against storms, the reforestation of degraded areas to prevent floods under changing climatic conditions, and the use of shade trees in coffee plantations to maintain production even as temperatures rise, among others.
- EbA can be applied in natural landscapes and seascapes, and in human-managed landscapes such as agricultural and urban areas.
- In addition to helping people adapt to climate change, EbA also contributes to climate mitigation, disaster risk reduction, biodiversity conservation and sustainable development.

Why do we need indicators to measure the adaptation outcomes of EbA?

- Currently, there is no general agreement on how to measure the adaptation outcomes of EbA.
- Many EbA projects simply measure the implementation of project activities (or outputs) (e.g., hectares of wetlands rehabilitated, farmers implementing particular practices), but do not assess the **actual adaptation outcomes** that EbA can deliver (Figure 1).
- Measuring and tracking the adaptation outcomes of EbA would allow policy makers, donors and practitioners to evaluate the impacts of EbA investments, monitor EbA effectiveness, and evaluate progress towards national adaptation goals. It could also help boost confidence and investment in EbA interventions.

¹-CBD. 2009. Connecting biodiversity and climate change mitigation and adaptation. Report of the second ad Hoc Technical Expert Group and Climate Change. CBD Technical series No. 41. Secretariat of the convention on Biological Diversity.

Figure 1. Examples of EbA interventions implemented to address specific climate change impacts, and the outputs and outcomes that can be achieved through EbA implementation.



What adaptation outcomes can be achieved through EbA and which indicators can be used to measure them?

- Based on a review of 60+ EbA projects (available in the UNFCCC, CCBA, GEF, UNEP and USAID databases), we identified 14 adaptation outcomes (in 6 major categories) that can be achieved through EbA (see Figure 2).
- In Figure 2, we propose a set of indicators that could be used to measure the adaptation outcomes of EbA interventions.

Figure 2. Examples of EbA interventions that could lead to adaptation outcomes, and suggested indicators that could be used to measure such outcomes. All indicators should be compared to the baseline condition (prior to EbA implementation).

Eba interventions	Adaptation outcomes from EbA interventions	Dimensions of human wellbeing	Suggested indicators
Establishment of marine non-take zones; restoration of mangroves	Reduced loss of assets of coastal communities and infrastructure due to extreme weather events	Assets	1. % of infrastructure damaged after extreme events. (e.g. hospitals schools (% of facilities damaged), homes (% of houses damaged), roads (% of km of roads damaged), protected areas (% of area damaged), agricultural land (% of hectares of agriculture damaged), cultural and recreation sites (% of area damaged)).
Protection and restoration or high-altitude forests	Reduced loss of assets of urban and non-urban communities and infrastructure due to extreme weather events		
Restoration of coral reef; rangeland management; development of policies to regulate the use of forest	Reduced impacts of climate change on ecosystems that maintain livestock production, marine and freshwater fisheries, and natural products for household consumption	Food security	2. Prevalence of moderate or severe food insecurity in the population after extreme weather events or through time.
Training on agriculture practices, implementation of agriculture practices, (e.g. agroforestry and soil conservation)	Reduced negative (and direct) impacts of climate change on livestock and crop production (mainly through physical damage) for household consumption		
Implementation of agriculture practices (e.g. agroforestry and soil conservation)	Reduced impacts of climate change on ecological interactions (pest, diseases, pollination) that affect crop and livestock production for household consumption		
Restoration of coral reefs; rangeland management; development of policies to regulate the use of forest	Reduced impacts of climate change on ecosystems that maintain livestock production, marine and freshwater fisheries, and tourism for profit	Livelihoods	3. Average income from sustainable crop and/or livestock production, sustainable marine and freshwater fisheries, and/or eco-tourism of small-scale per household after extreme weather events, or through time.
Training on agriculture practices; Implementation of agriculture practices, (e.g. agroforestry and soil conservation)	Reduced negative (and direct) impacts of climate change on livestock and crop production (mainly through physical damage) for profit		
Implementation of agriculture practices (e.g. agroforestry and soil conservation)	Reduced negative impacts of climate change on ecological interactions (pest, diseases) that affect crop and livestock production for profit		

Forest restoration, capacity building on forest restoration	Reduced impacts of climate change on water quality and quantity for human use	safety and resource security	<p>4. % of population with access to enough and clean drinking water under extreme events, or through time.</p> <p>5. Percentage of deaths and missing persons in various demographic groups after extreme events.</p>
Protection and restoration or high-altitude forests	Reduced loss of lives in urban and non-urban communities due to extreme weather events		
Establishment of marine non-take zones; Restoration of mangroves	Reduced loss of lives in coastal communities due to extreme weather events		
Restoration of swamp forest; Development and restoration of overflow areas and reed marshes	Reduced impacts of climate change on the incidence of vector borne diseases	Health	<p>6. People's years lost due to vector borne diseases of various demographic groups within the population.</p> <p>7. People's years lost due to vector borne diseases related to climate change, respiratory distress and heat stroke, during extreme events, of various demographic groups within the population.</p>
Establishment of green roofs and trees in urban areas	Reduced negative health effects (respiratory distress and heat stroke) due to temperature extremes and fires		

What is needed to encourage the use of a common set of indicators to measure the adaptation outcomes of EbA?

- Present and discuss adaptation outcomes indicators with technical advisory bodies (e.g. adaptation committee of the UNFCCC, CBD, IPBES, FEBA-Friends of EbA, among others) to enhance awareness of the need for those types of indicators and to refine them further.
- Advocate for the inclusion of adaptation outcomes indicators in monitoring and evaluation systems already used by governments at the national and subnational levels, and in monitoring frameworks required by donors.
- Share information on adaptation outcomes that can be achieved through EbA and indicators that can be used to measure them, as well as case studies, with policy makers, donors and practitioners, to encourage their adoption.



Building on successful research, demonstration projects, and engagement in international policy, CI is driving a set of key steps toward eliminating greenhouse gas emissions from the loss of carbon-rich ecosystems and securing the ecosystems that strengthen humanity's adaptive capacity to the impacts of climate change.

Authors

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