

Measuring the adaptation outcomes of ECOSYSTEM-BASED ADAPTATION

What is Ecosystem-based adaptation?

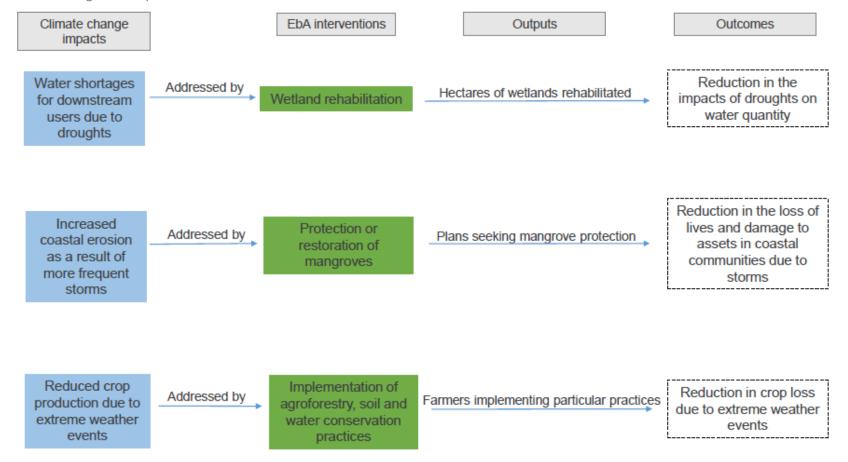
- Ecosystem-based adaptation (EbA) is "the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change" (CBD 2009¹). It includes the conservation, restoration and sustainable management of ecosystems and biodiversity 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 indicators² 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	Sı	uggested indicators to measure adaptation outcomes
		Reduce the loss of assets of coastal communities and infrastructure due to extreme weather events	IJ	-Damage avoided from destruction of housing,
Restoration of mangroves		Reduce the loss of assets of urban and non-urban communities and infrastructure due to extreme weather events	7	transportation, commercial structures and agricultural land during extreme events
Restoration of coral reefs		Reduce the impacts of climate change on ecosystems that maintain livestock production, marine and freshwater fisheries,		
Rangeland management		and natural products for household consumption		-Sustainable livestock production under changing
Development of policies to regulate the use of the forest		Reduce the negative (and direct) impacts of climate change on livestock and crop production (mainly through physical damage) for household consumption	-	climate conditions or during extreme events - Sustainable crop production under changing climate conditions or during extreme events
Training on particular agriculture practices	- XI. 7	Reduce the impacts of climate change on ecological interactions (pest, diseases, pollination) that affect crop and livestock production for household consumption		-% of food-secure households under changing climate conditions or during extreme events
Implementation of particular agriculture practices (e.g.		Reduce the impacts of climate change on ecosystems that maintain livestock production, marine and freshwater fisheries, and tourism for profit		
agroforestry and soil conservation) Forest restoration	//\ \ \ \ \ \	Reduce the negative (and direct) impacts of climate change on livestock and crop production (mainly through physical damage) for profit		 -Income from sustainable crop and livestock production, marine and freshwater fisheries, and tourism per household under changing climate conditions or during extreme events
Capacity building on forest restoration	**	Reduce the negative impacts of climate change on ecological interactions (pest, diseases) that affect crop and livestock production for profit	ľ	
Establishment of marine non-take zones		Reduce the impacts of climate change on water quality and quantity for human use		-% of population with access to reliable, safe and
Protection and restoration of high altitude forests		Reduce the loss of lives in urban and non-urban communities due to extreme weather events		An opposition with access to reliable, safe and affordable water under changing climate conditions or during extreme events Deaths avoided from various demographic groups
Restoration of swamp forests	/ / W	Reduce the loss of lives in coastal communities due to extreme weather events		during extreme events
Development and restoration of overflow	Health	Reduce the impacts of climate change on the incidence of vector borne diseases related to climate change		-Disability-adjusted life year (DALY) due to borne diseases related to climate change after flooding events -Avoided hospital beds/days and doctor visits due to respiratory distress and heat stroke during extreme temperature events
areas and reed marshes		Reduce the negative health effects (respiratory distress and heat stroke) due to temperature extremes, specially in urban areas		
Establishment of green roofs and trees in urban areas		Reduce the impacts of climate change on cultural and recreation sites		-Damage avoided on cultural and recreation sites under changing climate conditions or during extreme events

² This is a work in progress and the suggested indicators are in the process of being developed further.

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

Donatti C.I.^{1*}, Andrade A.¹, Burke L.², Chhetri N.³, Cook J.⁴, Fedele G.⁵, Friedrich C.⁶, Goldstein A.¹, Harvey C.A.¹, Hole D.¹, Kontorov A.⁶, Leiter T.⁷, Mack S.⁸, Menazza S.⁹, Ndiaye D.¹⁰, Panfil S.¹, Ries F.¹¹, Rizvi A.R.¹² & Schurman H.¹

1.Conservation International (CI), 2.World Resources Institute (WRI), 3. Arizona State University, 4. USAID, 5. French Agricultural Research Centre for International Development (CIRAD), 6. United Nations Environment Programme (UNEP), 7. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), 8. Tierra Resources, 9. The Nature Conservancy (TNC), 10. Adaptation Fund, 11. Programme office of the International Climate Initiative (IKI), 12. International Union for Conservation of Nature (IUCN).

^{*} for more information, please contact cdonatti@conservation.org