Scaling-up Mountain Ecosystem-based Adaptation: building evidence, replicating success, and informing policy

Background

The provision of clean, freshwater by rivers originating upstream in mountains and their flow downstream is a critically important ecosystem service. When moist air is forced upward by mountain ranges, the changes in temperature and pressure most often result in some form of snow or rain – stored in wet seasons as snow on mountain tops or glaciers and as water in lakes (Guernsey, 1987).

During hot and dry seasons, this stored water is released downstream, providing a steady supply for the demands of freshwater downstream. These mountain waters – which store and supply water to 'sustain human demands – are called water towers' (Immerzeel, et al, 2019). These water towers are, therefore, critical for water security.

Apart from the provision of water, through their ecological processes, mountain ecosystems are essential in the water cycle (Immerzeel, et al, 2019), and also provide a suite of essential services to mountain communities – such as food, fibre, medicines and other non-timber forest products – for their daily lives and livelihoods (IUCN, 2022). Downstream, the provision of freshwater in more highly populated areas is important as drinking water and also for agriculture and industry (IUCN, 2022). In addition, healthy mountain ecosystems provide additional benefits – co-benefits –

regulating not only water flow, but its quality, as well as filtering the air; serving as carbon sinks; pollinating flowers and dispersing seeds; ensuring pest and disease control; and providing protection against the impacts of natural hazards (Price & Egan, 2014).

As much as 10% of the world's population lives in high mountain areas, less than 100 km from glaciers or permafrost (Hock et al., 2019). (In Colombia, 60% of its population, including urban populations, live in mountain areas (Red Cross, 2021). By 2050, the world's mountain population is expected to grow to 736–844 million (Hock et al., 2019).

About a quarter of the world's land mass comprises mountains (UNEP, undated), but as much as half of the world's global biodiversity hotspots are found in these regions (Immerzeel, et al, 2019). Mountain ranges are also historic and cultural sites and they attract millions of tourists from all over the world (Immerzeel, et al, 2019).

Human activities – such as habitat destruction (for example, agricultural expansion, urbanisation, large-scale infrastructure development); unsustainable land use practices (for example, overgrazing) and overexploitation (for example, illegal logging and extraction of wood) – are also threatening the health of these valuable ecosystems (Odawa & Seo, 2019; UNDP, 2022).

Mountains are also highly affected by climate change and, in the last century, they warmed faster than lower elevations (Proce & Egan, 2014). Globally, most glaciers are melting and rainfall patterns are also changing because of climate change. This means that the timing, quantity and quality of water supplied by mountains are changing (Immerzeel et al., 2019).

Ecosystem-based Adaptation (EbA)

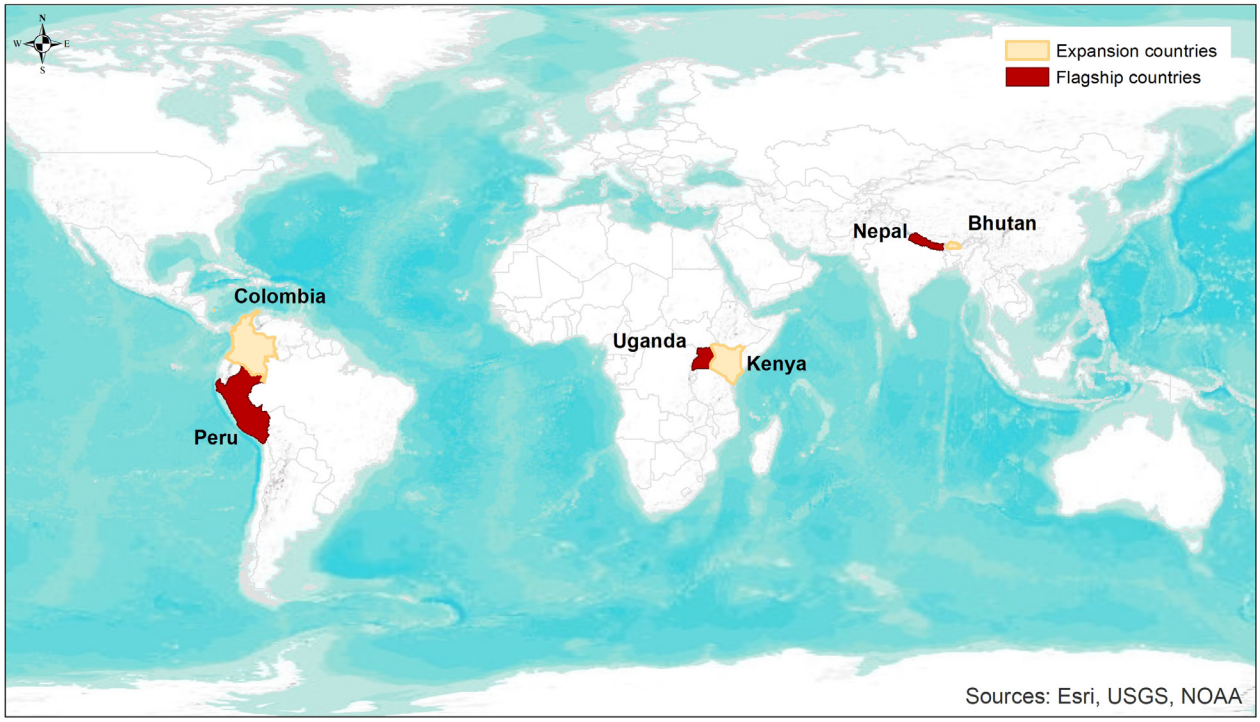
Among the many approaches available to reduce the impacts of climate change is adaptation. The International Panel on Climate Change defines climate change adaptation as 'the process of adjustment to actual or expected climate and its effects' (IPCC, 2014). Adaptation is becoming more and more important because of the current projections regarding climate change.

Ecosystem-based adaptation is a cost-effective approach that yields multiple benefits to for both communities and ecosystems. The Secretariat to the Convention on Biological Diversity defines ecosystem-based Adaptation (EbA) as ' 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'.

Thus, EbA can be identified by three elements. It:

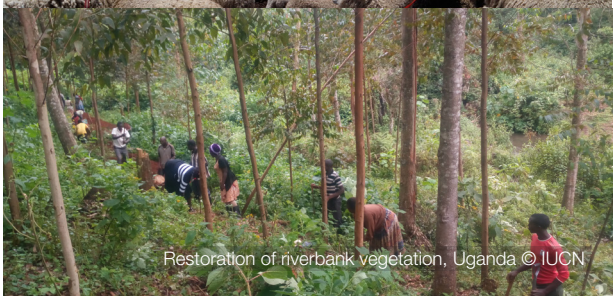
1. helps people adapt to climate change;
2. makes use of biodiversity and ecosystem services; and
3. is part of an overall adaptation strategy (FEBA, 2020).

Given the vulnerability of mountain ecosystems and



Communities preparing a nursery for P. polyphylla, Chilime, Nepal © Alisa Rai

Communal pastureland, Miraflores, Peru © IDM



Restoration of riverbank vegetation, Uganda © IUCN

mountain communities to the impacts of climate change, from 2011-2016, a flagship programme called '[Global Ecosystem-based Adaptation (EbA) in Mountain Ecosystems]' was implemented jointly by UNEP, UNDP and IUCN, and funded by the Government of Germany through the International Climate Initiative (IKI). In partnership with the Governments of Nepal, Perú and Uganda, this programme was implemented as pilot projects in mountain ecosystems in these three countries. This programme contributed to increasing the adaptation capacities of communites and ecosystems, while decreasing vulnerabilities by promoting sustainable livelihoods (UNDP, 2015). At the national level, the demonstration of the efficacy of EbA at project sites paved the way for integration of EbA into national policies and plans. At the global level, IUCN – through the network Friends of Ecosystem-based Adaptation (FEBA) – developed an EbA Learning Framework to map and assess the effectiveness of initiatives (FEBA, 2020), as well as convening regional climate change fora through the Global Adaptation Network (GAN) and enhancing capacity building through EbA-focused training workshops. Through advocacy of this flagship programme, EbA has been mainstreamed into global policy (for example, the CBD and the UNFCCC) (UNDP, 2015).

Scaling-up Mountain Ecosystem-based Adaptation: building evidence, replicating success, and informing policy

Building upon the success and achievements of the Mountain EbA Flagship Programme, the project 'Scaling-up Mountain Ecosystem-based Adaptation: building evidence, replicating success, and informing policy' was implemented between 2017–2022.

Key facts

- The project expanded the ambit of the flagship programme and scaled-up EbA by promoting climate change adaptation in three additional countries, neighbouring the flagship countries: Bhutan (next to Nepal); Colombia (neighbouring Perú); and Kenya (next to Uganda).
- These new countries were dubbed 'the expansion countries' and were expected to replicate effective EbA actions, while the flagship countries were expected to consolidate, replicate and scale-up their existing EbA actions.
- EbA actions included ensuring that the flagship

Identifying EbA options for the Chamgang watershed, Bhutan © IUCN

Participatory spatial mapping, Chepkitale NR, Kenya © IUCN

EbA training for the GEF project , Bogotá, Colombia © IUCN

Woman carrying cut broom grass, Panchase, Nepal © IUCN

project, as well as new projects, yielded long-term evidence and lessons; extracted knowledge and evidence; built local capacity to replicate successful approaches; and informed local, national, and international adaptation plans and policies, such as National Adaptation Plans.

- The project was implemented in nine sites – one original and one additional site in each flagship country, and a replication site in each expansion country.
- In Perú 8,881 ha of Puna grasslands, in Nepal 6,774 ha of forest, and in Uganda 1,039.7 ha of riverbanks and farmlands respectively were restored or better managed through this project.
- Nine EbA actions, three indicating long-term effectiveness (for ecosystem services) and sustainability are now implemented in the three flagship countries.

These include:

- The restoration of roadside vegetation in two project sites in Nepal to reduce erosion, through the planting of broom grass. When grown, the above-ground parts of this grass are cut and sold to make brooms and as fodder for livestock, economically and socially empowering participant families.
- The restoration of ancestral Yanacancha dams using both traditional knowledge and modern technologies to improve the water quality of springs in three of the four sites in Perú and the consequent community management of native pastures. Communities now obtain more milk yield and are able to sell livestock for a markedly increased price.
- The restoration of riverbanks and the introduction of agroforestry in farmlands in two micro-catchments in Uganda, to reduce the impacts of flooding. The grass on riverbanks and in farms provides fodder for livestock and on-farm agroforestry have yielded benefits of improved livelihoods and food security for families in project areas.

- In expansion countries,
  - The project in Bhutan has supporting the Tarayana Foundation and the College of Natural Resources, Royal University of Bhutan by providing technical inputs to enhance their ongoing programme on springshed management, for two springsheds.
  - In Colombia, the project is i) collaborating with the GEF-funded project ‘Adaptation to Climate Impacts in Water Regulation and Supply for the Chingaza-Sumapaz-Guerrero Area’; ii) contributing to capacity building processes and the exchange of experiences: spaces for capacity building have been developed both at local and national levels; and iii) developing an e-learning course on EbA adapted to the Colombian context
  - In Kenya, the project has worked with an Indigenous community to carry out community-based vulnerability analysis, spatial mapping, feasibility analyses to identify suitable springs for protection and constructed infrastructure to protect a spring and ensure water security.
- In terms of mainstreaming EbA in the six countries,the mountain EbA approaches propounded by the project are now integrated into several national/sub-national plans/policies or strategies across the six countries.
- The expected community outreach was 2,200 persons (50% women) for Perú; 600 (70% women) for Nepal;

1,500 (55% women) for Uganda; and 500 Kenya. Perú has achieved an outreach of 1,676 (46% women); Nepal has surpassed the target with 2,200 persons; Uganda has 2,357 and Kenya 115.

- At the global level, these EbA approaches have been mainstreamed and shared by global policy advocacy (such as through the Friends of EBA and the Global EbA Fund at various international fora) and will continue to be represented across global climate, biodiversity, and sustainable development frameworks.
- In all countries, networks and synergies have been forged and established, so that the spread of EbA in the project countries is assured.
- The project's three-pronged approach of working simultaneously with local communities, local government and national government has achieved the scaling-up impacts expected at the beginning.
- In several of the countries of the Scaling-up Project (for example, Bhutan, Colombia, Nepal and Peru) more projects have been funded by the Global EbA Fund, ensuring the continuity of EbA in mountains ecosystems and communities which are highly vulnerable to climate change.

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