



NATURE-BASED SOLUTIONS IN MOUNTAINS BUILD CLIMATE RESILIENCE

...and improve water security downstream.



MOUNTAINS ARE THE SOURCE

- Many of the world's most important crops are mountain crops- including **tea and coffee!**

- Key to **food security** are crops that have been diversified in mountains— including maize, potatoes, sorghum, tomatoes, beans and apples.

- More than **4,000 varieties of native potatoes** grow in the Andean highlands of Peru, Bolivia, and Ecuador. 2,000 varieties of rice are grown in Nepal.

- Every single day, over **half of humanity** relies on mountains for freshwater.

- All major rivers of the world **begin in mountains.**

- Billions of people downstream rely on **mountain water** for drinking, sanitation, irrigation and hydropower.

- Mountains are home to many **ancient indigenous cultures and ethnic groups.**
- Mountain cultures maintain a wealth of **traditional knowledge** and practices.
- **Thousands of languages** are spoken in mountain areas.

Mountains are important in ways you may not realize.



- Mountains collect, channel, and store **freshwater on every continent.**



- Mountains are essential to the Earth's water cycle and help regulate the **global climate.**



- Of the planet's 34 terrestrial biodiversity "hotspots," **25 are in mountains.**

- Mountains support **25% of all terrestrial biodiversity**, including increasingly rare animals--gorillas, snow leopards, condors, mountain lions, red pandas, etc.

Remote highland communities need ways to adapt--and quickly.

Mountain people rely on their surrounding environment for water, food, medicine, fuel, pastures, building materials and more. Nature is the very foundation of their livelihoods. Healthy mountain ecosystems also help buffer the impacts of climate change—upstream and down, for humans and wildlife. The quantity and quality of water on the coast is closely related to the health of highland watersheds.

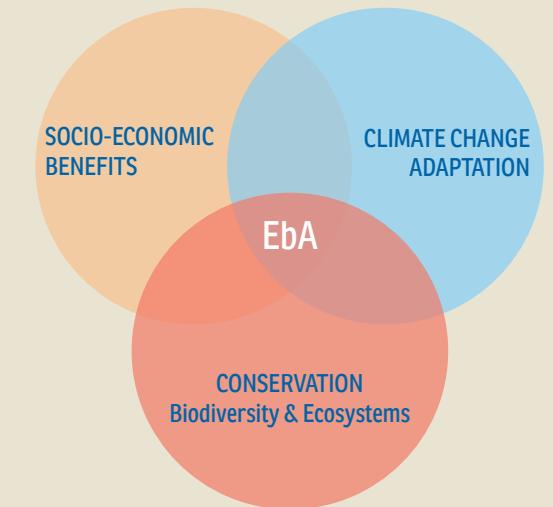
Mountain ecosystems and remote mountain communities can be revitalized and made more resilient through nature-based solutions. Examples include cultivating valuable medicinal plants instead of wild harvesting them, planting buffer zones to protect riverbanks, restoring ancient water management systems, and conserving mountain wetlands to revitalize native grasslands. These solutions help mountain communities, native plants, and wildlife rebound and are part of an "Ecosystem-based Adaptation" (EbA) approach.

EbA is widely recognized as an important strategy for adapting to the impacts of climate change. It is cost-effective, yields multiple benefits, and can be implemented by communities themselves. EbA specifically includes and honors the needs and voices of women, indigenous peoples and socially-marginalized groups. As custodians of local natural resources, these groups are key to conserving mountain forests and watersheds.

To identify which socio-economic and environmental factors make local communities most vulnerable, we consult with village leaders, local governments, and other constituents in the upper watersheds. Next steps include working with these groups to develop a plan for specific EbA activities that address some of their key vulnerabilities. Once the plan is in place, we assist communities in implementing a range of activities to restore and protect local water sources, forests, and pasturelands. These solutions also help stabilize landslide-prone areas and improve local livelihoods.

MOUNTAINS ARE WARMING FASTER THAN THE GLOBAL AVERAGE.

Building Climate Resilience through Ecosystem-based Adaptation (EbA)



Sustainable Development in Mountains

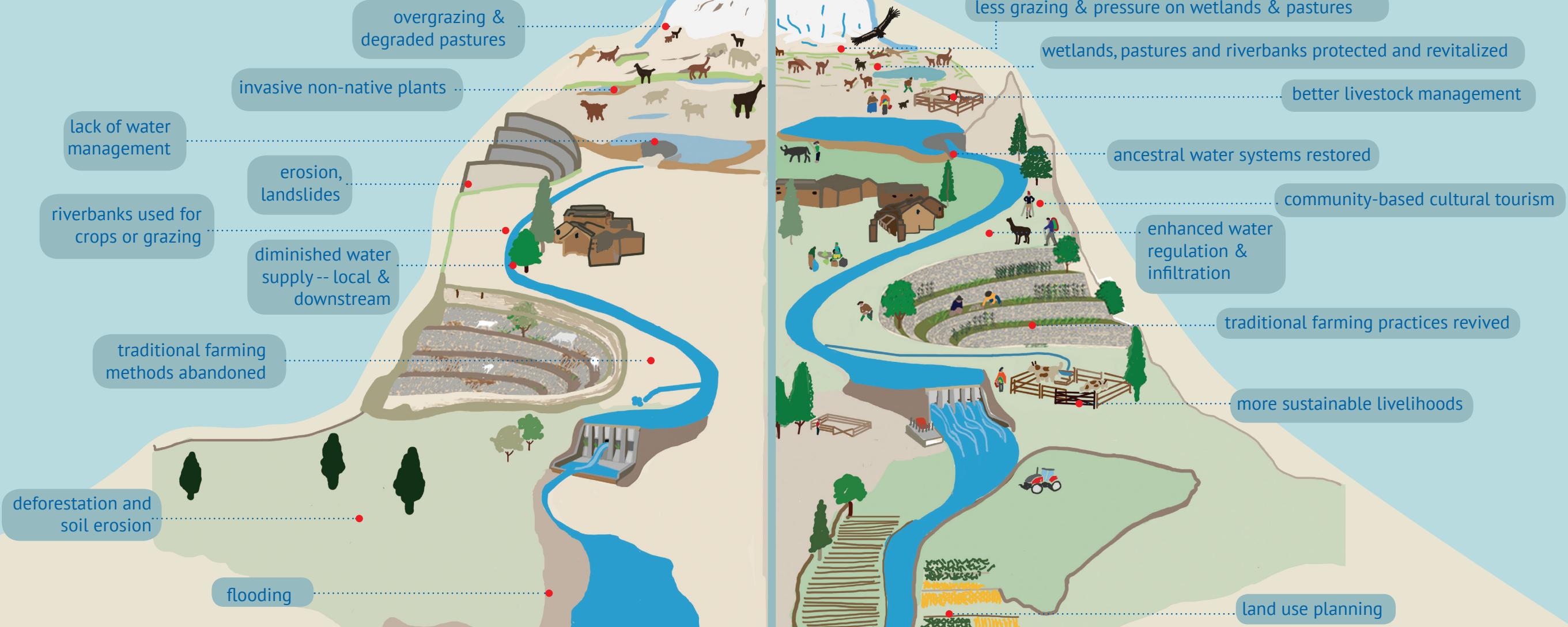


MOUNTAIN CHALLENGES

Remote communities are more vulnerable to climate change. They are far from services and political centers, have less political and economic influence and are less food secure.

NATURE-BASED SOLUTIONS

Healthy ecosystems make remote communities more resilient to climate change, more food secure, and offer more livelihood options.





UGANDA - Mt Elgon

PROTECTING RIVERBANKS, REFORESTING TO CONSERVE SOIL AND WATER

The Mt. Elgon ecosystem straddles eastern Uganda and western Kenya. Communities in this region are particularly vulnerable to climate change due to rapid population growth and their strong dependence on the mountain's natural resources. To help local communities better manage the declining water supply from the Chebonet and Kaptokwoi rivers, our EbA project has focused on restoring catchment areas in key watersheds. Within the Sipi-Chebonet watershed, community members agreed to establish a six-meter buffer zone to protect river banks. This land had become degraded from intensive crop cultivation at the river's edge. Demarcation trenches have been prepared and buffer zones are being replanted with native grasses while other vegetation is allowed to recover. The main objective is to improve the river's water quality and flow since local communities and their livestock depend on this water for drinking. Once vegetation has fully grown back in the buffer zones, locals will

also be able to collect fodder for livestock along with herbs and medicinal plants. In the long run, the protected riverbanks will reduce flooding due to heavy rain and outbreaks of associated diseases such as malaria, cholera, and dysentery. More soil and water conservation measures are underway in both of these watersheds—trenches, trash lines, soil bunds along contour lines, and community tree nurseries.



NEPAL - Himalayas

INTEGRATED SOLUTIONS BUILD SUSTAINABLE LIVELIHOODS

Remote Himalayan communities in Nepal are especially vulnerable to climate change impacts. Water supply and access can be very challenging, rural out-migration is undercutting traditional livelihoods, flooding and landslides are a perennial problem, and unsustainable harvesting has decimated wild populations of valuable, medicinal plants. Like many mountain villages, the communities of the Panchase (western Nepal) and Chilime (central Nepal) watersheds are seeking sustainable ways to make a living while also conserving their surrounding ecosystems. EbA solutions in the Panchase watershed include livestock sheds that collect organic fertilizers, organic farming methods and diversified home gardens, water source protection, planting for erosion control, and improved beekeeping. EbA solutions in the Chilime watershed also include beekeeping, as well as cultivating medicinal plants on degraded land and a system that channels water from a high mountain source



to revitalize pastures at a lower elevation. This improved water and grassland management enables herders to successfully continue their traditional way of life. Better water supply and access, revitalized pastures, expanded livestock management, reforestation, and sustainable cash crops—these are some of the integrated EbA solutions that lead to more stable income options. As food security increases and local economies stabilize, highland communities become more resilient to climate change.



South
America

PERU - Andes

RESTORING ANCIENT WATER SYSTEMS, IMPROVING PASTURES



In the **Nor Yauyos Cochas Landscape Reserve of central Peru**, the remote, high Andean communities depend on a steady supply of water for their livestock—alpacas, llamas, sheep, and cattle. In Canchayllo, Miraflores, Tanta, and Tomas, locals are working to restore the wetlands, peatlands, and native grasslands of their surrounding *puna* ecosystem. Farmers, herders, and native wildlife all rely on this fragile ecosystem—as do millions of people downstream, including the city of Lima. Puna landscapes have been drying out and shrinking due to climate change and overgrazing by livestock. Our project is helping locals to repair and restore existing reservoirs, irrigation canals, and other water regulating systems originally built by their ancestors as far back as 1,000 CE. These EbA efforts combine traditional knowledge with modern science and materials to help ensure a steady supply of water, which helps local livelihoods. In Miraflores, for example, we have worked with the community to protect wetlands, repair ancient canals, and develop a grazing management plan that allows the grasslands to recover. This, in turn, boosts livestock productivity. In Tomas, the community is expanding fencing to reduce grazing pressure on key grasslands. They are also improving how they manage vicuñas in order to benefit from the animals' valuable fiber. Project results show that restoring these ancient water management technologies, which lie unused and often forgotten throughout the Andes, could help to revive the entire puna ecosystem.



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Learn more about the **Scaling Up Mountain Ecosystem-based Adaptation Program**



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