



Adapting to Climate Change: Freshwater Ecosystems

Climate change will significantly impact freshwater ecosystems and the people and biodiversity that depend upon them for their survival.

Glaciers and ice caps are melting, affecting the entire watershed including human water supplies and reducing the productivity of riverine fisheries. Increased evaporation, drier soils and more unpredictable rainfall increase the risk of droughts and lower crop yields. Groundwater supplies are being affected by saltwater intrusion from sea level rise in coastal areas. Additionally, warmer water temperatures, combined with existing threats such as sedimentation, will exacerbate water quality issues for human consumption, impact energy generation, and endanger freshwater biodiversity. Human migration and increased competition for resources threaten social stability, especially for the more than one billion people living in water scarce environments.

Recognizing the importance of healthy ecosystems in adapting to the impacts of climate change can provide multiple benefits. Adaptation that takes into consideration the services that ecosystems provide, also known as ecosystem-based adaptation, harnesses the natural processes and functions of ecosystems to adapt to climate change, including the critical freshwater benefits of sustaining the provision of drinking water, waste removal, energy generation and fisheries production.

The Way Forward:

- **Apply the best available science and manage uncertainty.** Identifying adaptation measures that target a broad range of potential climate change impacts to choose sound, “no regrets” solutions.
- **Work with and build local capacities.** Supporting local practices and incorporating traditional knowledge to respond to changes in water supply, droughts and floods that can reduce vulnerability to climate change.
- **Mainstream good and avoid bad adaptation (maladaptation) responses.** Building climate resilience into water projects in areas of high climate vulnerability that utilize a balance between soft and hard engineering approaches and avoid trade-offs between services.
- **Apply multi-disciplinary approaches.** Combining biodiversity conservation, ecosystem management and socio-economic expertise to inform development and conservation decision-making.
- **Monitor and adaptively manage.** Adjusting land and water resource-use decisions in response to ecosystem and service delivery information.

FIELD DEMONSTRATIONS:

Ecosystem approaches to adaptation

- In Cambodia, CI supported the Cambodian government’s effort to triple the fish sanctuaries in Tonle Sap lake to cover 50,000 hectares (nearly 125,000 acres), and to replant 1,000 hectares (nearly 2,500 acres) of illegally logged forest—increasing populations of fish, reducing erosion and other pollutants, and stabilizing water supply.
- In Colombia, CI and partners reforested 560,000 hectares (more than one million acres) and improved agricultural production sustainability with Clean Development Mechanism financing in the San Rafael watershed—providing mitigation and adaptation benefits by securing urban water supplies, extending hydropower generation, increasing resilience of water sources, and sequestering carbon.
- In Madagascar, the government, CI and partners conducted climate vulnerability assessments resulting in recommendations for watershed management, restoring riverine forests and improving connectivity between rainforest fragments . Preliminary analysis indicate that over 4 million people benefit from water sources coming from protected natural habitats in these watersheds. Ongoing analysis is assessing the role of forests and wetlands in providing water access for agriculture and direct consumption.

OUR VISION

We imagine a healthy, prosperous world in which societies are forever committed to caring for and valuing nature, our global biodiversity, for the long-term benefit of people and all life on Earth.

OUR MISSION

Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity.

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Local village in Cardamon mountains, Cambodia