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# SERVIR GLOBAL

## SERVIR and ECOSYSTEMS

**Ecosystems.** Changes can already be observed in species distribution and interaction, and continued climate change and human pressures are expected to increase stresses on ecosystems. Only through understanding and monitoring these changes, do we have a hope of adapting to safeguard important ecosystem services and biodiversity.

**SERVIR connects** space to village by making geospatial information, including Earth observation data from satellites, Geographic Information Systems, and predictive models useful to developing countries. SERVIR is a joint development initiative of NASA and USAID, working in partnership with leading regional organizations around the globe. SERVIR helps those most in need of tools for managing climate risks and land use.

SERVIR global hubs include:

- SERVIR-Eastern and Southern Africa, hosted by the Regional Centre for Mapping of Resources for Development (RCMRD)
- SERVIR-Himalaya, hosted by the International Centre for Integrated Mountain Development (ICIMOD)
- SERVIR-Mekong, hosted by the Asian Disaster Preparedness Center (ADPC). Launched October 2014.



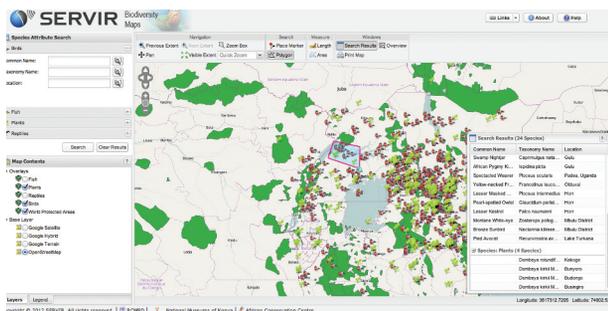
UFRED HOOGERVORST

**SERVIR places** science in the service of society by building the technical capacities of regional organizations with an established track record of working with governments and communities to apply geospatial tools at the local and regional levels. Through the SERVIR network, experts at SERVIR regional hubs partner with local decision-makers and local and US-based scientists to create new datasets, maps, and decision-support tools that answer critical development questions. SERVIR hubs also provide training to build capacity in local institutions for evidence-based decision-making to meet societal needs.

### Safeguarding Ecosystems

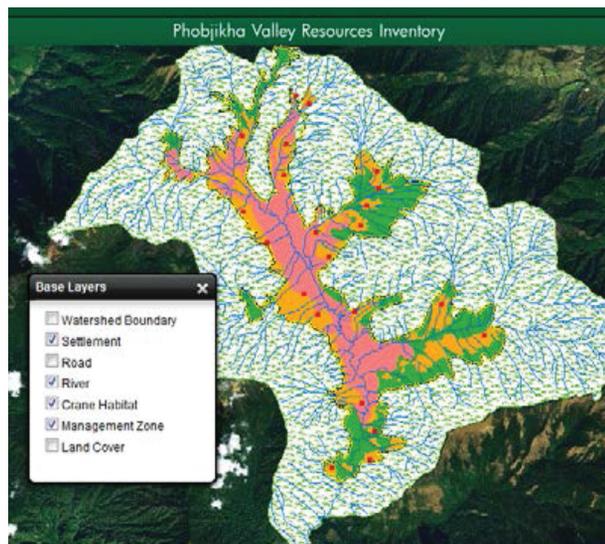
#### Protecting Biodiversity

Climate change can affect biodiversity by shifting suitable habitat areas, resulting in shifting distribution patterns of many species of flora and fauna. In collaboration with non-governmental agencies and government ministries, SERVIR is linking the likely impacts of climate change to biodiversity and ecosystems in SERVIR-Himalaya and SERVIR-Eastern and Southern Africa. For example, Bhutan's Phobjikha wetlands ecosystem has long served as a stopping



Biodiversity map of eastern Africa as seen on the SERVIR web portal.

place on the Black-Necked Crane's migratory path. There are only about 5,000-6,000 of these graceful birds left in the world, and over 300 spend winters in the Phobjikha Valley. In the past 20 years the Valley has seen great changes in land use, including farming and permanent settlements. A collaboration among SERVIR, ICIMOD, and Bhutan agencies produced an analysis of land cover changes for the Phobjikha wetlands ecosystem. The project integrates satellite data with field measurements to develop geospatial databases on historical changes in land use, fodder, fuel resources, and crops. It also uses historical data to map potential crane habitats and support the zoning of Bhutan's Phobjikha Valley to help manage conservation efforts in the face of climate change.



Map showing conservation management zones in Bhutan's Phobjikha Valley.

### Monitoring Land Cover and Use

Bhutan is experiencing developmental pressures, urban expansion, and increased demand for agricultural land. At Bhutan's request, SERVIR-Himalaya is working closely with local technicians to assess changes in land cover and land use, help conserve biodiversity, manage natural resources, and protect the environment. SERVIR-Himalaya offers Bhutan an integrated database and maps showing land cover changes over the past 30 years. These tools help guide environmental decision-making and policies in Bhutan, supporting more effective forest management and land use practices.

### Mapping Biodiversity and Ecosystems

East Africa is a globally important center of biodiversity. As climate change affects the region's animals and plants it could also threaten its ecosystems, national parks, and tourism revenues. National Museums of Kenya collaborated with SERVIR-Eastern and Southern Africa to incorporate ground and satellite data to develop maps for selected flora and fauna as a baseline for assessing the potential impact of climate change on their ecosystems. The biodiversity visualization tool maps the region's spatial distribution of plants, fish, reptiles, and birds to produce a web-based biodiversity atlas and integrate future climate projections to help protect ecosystems and manage future land use. Efforts are also underway to expand this project to neighboring countries.

### Producing a Regional Atlas

During CATHALAC's partnership with SERVIR, they worked with the United Nations Environment Programme on a regional atlas to help analyze environmental changes as a tool for sustainable development. *The Latin America and Caribbean Atlas of Our Changing Environment* highlights the region's diverse environments, ecosystems, and species. It also shows how this natural wealth is under strong pressure from economic development, producing significant social and environmental changes. The Atlas uses more than 200 satellite images, maps, and graphs to raise awareness among policymakers and resource managers about the impact of rapid urbanization, climate change, deforestation, mining, and the loss of biodiversity.

**SERVIR strengthens** the ability of governments and other development stakeholders to incorporate Earth observations and geospatial technologies to respond to natural disasters, improve food security, safeguard human health, manage water and natural resources. Improved management of natural resources also helps to identify opportunities to improve economic growth while lowering greenhouse gas emissions and building resilience to climate change.

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