# SilvaCarbon

# Building capacity worldwide in measuring and monitoring forest and terrestrial carbon

Greenhouse gas (GHG) emissions from the agriculture, forestry, and other land use (AFOLU) sector represent almost a quarter of total GHG emissions – more than the transportation sector and almost as much as the electricity and heat production sector, the leading source of anthropogenic GHG emissions (**IPCC 2014**). A large portion of global AFOLU emissions come from tropical deforestation and forest degradation. There are tremendous opportunities to mitigate global climate change by assisting tropical countries to curb deforestation, cultivate new forests, restore degraded forests, and improve forest management. These activities not only reduce carbon emissions but also bring important co-benefits such as sustainable livelihoods, resilient economic development, and biodiversity conservation.

However, in many tropical countries there is little existing information about forest and terrestrial carbon stocks and fluxes to guide mitigation strategies. Many governments are working to close this knowledge gap by developing landscape monitoring systems and terrestrial GHG inventories, but they face significant challenges overcoming domestic capacity limitations and funding constraints. International collaboration is needed to support their efforts. Given recent advancements in the science of forest and terrestrial carbon measuring and monitoring, including improvements in both remote sensing and ground-based methods, international support is particularly critical now for identifying and implementing cost-effective approaches that are appropriate to countries' individual circumstances.



Gabonese field inventory staff take measurements as part of the Gabon Forest Carbon Assessment supported by SilvaCarbon

With this in mind, US federal agencies have joined together to create the **SilvaCarbon** program.

## What is SilvaCarbon?

**SilvaCarbon is a US technical cooperation program to enhance the capacity of selected tropical countries to generate and effectively use improved information about forest and terrestrial carbon.**

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SilvaCarbon helps advance **REDD+** and other **climate change mitigation** and **low-emission development** initiatives by working with technical teams at government agencies in partner countries to design and implement credible, comparable, and transparent **landscape monitoring systems** and **terrestrial GHG inventories** that can provide input into the United Nations Framework Convention on Climate Change (**UNFCCC**).

The program functions as a **science delivery tool**, helping countries meet their individual capacity needs by channeling expertise and resources from eight US technical agencies, the **Global Forest Observations Initiative (GFOI)**, and diverse partners worldwide. Capacity building activities include technical assistance, hands-on training, workshops, study tours, South-South cooperation, and applied research.

**Cooperation and coordination** are central to the program. SilvaCarbon works closely with nearly 50 organizations around the world, including governments, universities, NGOs, and international institutions such as the Food and Agriculture Organization of the United Nations (**FAO**) and the United Nations REDD Program (**UN-REDD**).

## Where Does SilvaCarbon Work?

SilvaCarbon is global in geographic scope with a focus on high priority tropical forests. The program has engaged 25 countries to date through a combination of bilateral and regional activities, research partnerships, and support for in-country-technical advisors.



**Americas**
Belize
Brazil
Colombia
Costa Rica
Ecuador
El Salvador
Guatemala
Honduras
Mexico
Nicaragua
Panama
Peru

**Africa**
Cameroon
DR of Congo
Gabon
R of Congo
Zambia

**Asia**
Bangladesh
Cambodia
Indonesia
Lao PDR
Nepal
Philippines
Thailand
Vietnam

1) Demonstrate and compare forest and terrestrial carbon measurement and monitoring methodologies;

2) Build the capacity of selected developing countries to use forest and terrestrial carbon monitoring and management methodologies and technologies;

3) Facilitate the coordinated collection and dissemination of Earth observation data related to forest and terrestrial carbon monitoring and management, in cooperation with the Global Forest Observations Initiative (GFOI);

4) Strengthen the community of forest and terrestrial carbon technical experts; and

5) Enhance interagency cooperation and collaboration.

## Achievements

Countries are at different stages in the development of their landscape monitoring systems and seek SilvaCarbon support for different reasons. Some are building foundational capacity, while others are working to integrate different approaches or overcome specific technical challenges. SilvaCarbon has achieved a number of notable successes across a variety of contexts. Recent examples include:

➢ Helping **Peru** produce its first multi-temporal map of forest change, which can be used to estimate forest cover and deforestation rates and support Measurement, Reporting, and Verification (MRV) activities for REDD+;

➢ Providing training to **Vietnam** on GHG inventory tools that the country now uses to generate reports to the UNFCCC and inform its Nationally Determined Contributions;

➢ Working with a wide range of stakeholders in **Bangladesh** to determine the country's national forest inventory objectives, and collaborating to produce a draft inventory design;

➢ Supporting the design and analysis of **Ecuador's** national forest inventory by delivering training in open-source tools and facilitating technical exchanges with experts from FAO and counterparts in Colombia and Peru;

➢ Assisting the **Republic of Congo** to produce its first national-scale, multi-strata forest/non-forest map for sustainable forest management;

➢ Supporting **Gabon's** first nationwide forest carbon assessment, which included the establishment of a network of forest inventory plots that has been adopted as the National Natural Resource Inventory;



A SilvaCarbon study tour in Utah on forest carbon measurement

➢ Co-conducting nine regional workshops in **South and Southeast Asia** that brought together forestry departments, mapping authorities, and space data agencies from eight countries to identify forest monitoring needs, assess different monitoring approaches, and share lessons learned;

➢ Organizing a series of study tours for **Central American** forest practitioners to learn alongside US experts about below-ground carbon measurement and forest inventory information systems;

➢ With **GFOI**, disseminating needed Landsat Earth observation data to 21 countries and supporting national data acquisition strategies; and

➢ Funding eleven innovative **research grants** addressing critical carbon measurement challenges.

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SilvaCarbon agencies include the US Agency for International Development (USAID), US Department of State, US Forest Service (USFS), US Geological Survey (USGS), Environmental Protection Agency (EPA), National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), and Smithsonian Institution. Funding is provided primarily by USAID and the US Department of State, with additional support from other agencies and partners. SilvaCarbon is a US contribution to the Global Forest Observations Initiative (GFOI), leading its capacity building component.