



# SilvaCarbon

## FY20-25 STRATEGY

### Interagency Program Strategy for Fiscal Years 2020-2025

Prepared by the USDA Forest Service  
and the US Geological Survey



## Contents

Contents .....	2
Acronyms and Abbreviations .....	4
Introduction .....	7
SilvaCarbon Overview .....	7
Background .....	7
Programmatic Approach .....	10
Pathways for Achieving Results .....	14
Country Engagement.....	15
Illustrative Results .....	18
Africa Strategy.....	19
Background .....	19
Vision for 2025 .....	22
Strategic Priorities and Expected Milestones .....	23
Strategy Development Process .....	27
Summary of Africa Country Engagement.....	28
Asia Strategy.....	29
Background .....	29
Vision for 2025 .....	32
Strategic Priorities and Expected Milestones .....	32
Strategy Development Process .....	34
Summary of Asia Country Engagement .....	35
Latin America and Caribbean Strategy.....	36
Background .....	36
Vision for 2025 .....	38
Strategic Priorities and Expected Milestones .....	39
Strategy Development Process .....	41
Summary of LAC Country Engagement.....	42
Global Program Strategy .....	43
Background .....	43
Global Context.....	45
Vision for 2025 .....	47
Strategic Priorities and Expected Milestones .....	48
Annex 1: SilvaCarbon Country Context .....	55
Africa Focal Countries .....	55

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Asia Focal Countries .....	62
Latin America and Caribbean Focal Countries .....	66
Annex 2: COVID-19 Considerations.....	69
Africa .....	69
Asia .....	69
Latin America and the Caribbean .....	70
Global .....	70

## Acronyms and Abbreviations

ADPC	Asian Disaster Preparedness Center (SERVIR-Mekong Hub)
AFOLU	Agriculture, Forests, and Other Land Use
ALU	Agriculture and Land Use National Greenhouse Gas Inventory Software tool
BFD	Bangladesh Forest Department
BU	Boston University
BUR	Biennial Update Report (to the UNFCCC)
CENIGA	National Center for Geo-environmental Information (Costa Rica)
CEO	Collect Earth Online
CIFOR	Center for International Forestry Research
CNIAF	Centre National d'Inventaires et d'Amménagement Forestiers (ROC)
CN-REDD+	Coordination Nationale REDD+ (DRC)
COMIFAC	Commission des Forêts d'Afrique Centrale
CONAFOR	National Forestry Commission (Mexico)
COP	Conference of Parties (of the UNFCCC)
CRESA	Centre Regional D'Enseignement Specialise en Agriculture Foret-Bois (Cameroon)
DFRS	Department of Forest Research and Survey (Nepal)
DIAF	Direction des Inventaires et Aménagements Forestiers de la RD Congo (DRC)
DMHCC	Department of Meteorology, Hydrology and Climate Change (Vietnam)
DOS	US Department of State
DRC	Democratic Republic of the Congo
EC-JRC	European Commission Joint Research Centre
EROS	Earth Resources Observation and Science Center, US Geological Survey
ERPD	Emissions Reductions Program Document
ER-PIN	Emission Reductions Program Idea Note
ETF	Enhanced Transparency Framework
FACET	Forêts d'Afrique Centrale Evaluées par Télédétection
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FIA	Forest Inventory and Analysis
FIP	Forest Investment Program
FIPI	Forest Inventory and Planning Institute (Vietnam)
FLINT	Full Lands Integration Tool
FLR	Forest Landscape Restoration
FONAFIFO	National Forestry Financing Fund (Costa Rica)
FREL	Forest Reference Emission Level
FRL	Forest Reference Level
FRTC	Forest Research and Training Centre (Nepal, formerly DFRS)
FY	Fiscal Year
GCF	Green Climate Fund
GDANCP	General Directorate for Nature Conservation and Protection (Cambodia)
GEE	Google Earth Engine
GEO	Group on Earth Observations
GFOI	Global Forest Observations Initiative
GHG	Greenhouse Gas
GIMBUT	Inter-institutional Mapping Group (Guatemala)
GIS	Geographic Information Systems

GISTDA	Space Technology Development Agency (Thailand)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (Germany development agency)
GLAD	Global Land Analysis and Discovery group of the University of Maryland
GOFC-GOLD	Global Observation of Forest and Land Cover Dynamics
GTAC	Geospatial Service and Technology Center (of the US Forest Service – formerly RSAC)
HVC	High-Value Conservation
IAA	Interagency Agreement
ICF	Instituto de Conservación Forestal (Honduras)
ICIMOD	International Centre for Integrated Mountain Development (SERVIR-Hindu Kush Himalayan Hub)
IDEAM	Institute of Hydrology, Meteorology, and Environmental Studies (Colombia)
IGN	French Geographical Institute
IIAP	Instituto de Investigaciones de la Amazonía Peruana (Peru)
IIASA	International Institute for Applied Systems Analysis
IMN	National Meteorological Institute (Costa Rica)
INFONA	National Forest Institute (Paraguay)
IPCC	Intergovernmental Panel on Climate Change
ISFL	BioCarbon Fund Initiative for Sustainable Forest Landscapes
ISSI	International Space Science Institute
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KfW	German government-owned development bank (formerly KfW Bankengruppe)
LAC	Latin America and the Caribbean region
LULUCF	Land Use, Land-Use Change, and Forestry
MAE	Ministry of Environment (Ecuador)
MARD	Ministry of Agriculture and Rural Development (Vietnam)
MARN	Ministry of Environment and Natural Resources (El Salvador)
MEDD	Ministry of Environment and Sustainable Development (DRC)
MINAM	Ministry of Environment (Peru)
MINEPAT	Ministry of Economy, Planning, and Regional Development (Cameroon)
MOE	Ministry of Environment
MOEF	Ministry of Environment and Forests (Bangladesh)
MONRE	Ministry of Natural Resources and the Environment (Vietnam)
MRV	Measurement, Reporting, and Verification
NAMA	Nationally Appropriate Mitigation Action
NASA	US National Aeronautics and Space Administration
NC	National Communication (to the UNFCCC)
NDC	Nationally Determined Contribution
NFI	National Forest Inventory
NFI5	Fifth National Forest Inventory Cycle (Vietnam)
NFMS	National Forest Monitoring System
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NCB	Non-carbon benefits
NRSD	National Remote Sensing Department (Vietnam)
NTFP	Non-Timber Forest Products
ONACC	National Office of Climate Change (Cameroon)

OSFAC	Observatoire Spatial des Forêts d'Afrique Centrale
PDR	Personal Data Recorder
PEER	Partnerships for Enhanced Engagement in Research
PFES	Payment for Forest Ecosystem Services program (Vietnam)
QA/QC	Quality Assurance/Quality Control
RECOFTC	Center for People and Forests
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RIL	Reduced-impact logging
RLCMS	Regional Land Cover Monitoring System
ROC	Republic of the Congo
SAR	Synthetic Aperture Radar
SDIAF	Department of Forest Inventory and Management (Cameroon)
SEAM	Environment Secretariat (Paraguay)
SEPAL	System for Earth Observations, Data Access, Processing and Analysis for Land Monitoring
SIMOCUTE	National Land Use, Land Cover and Ecosystems Monitoring System (Costa Rica)
SINAC	National System of Conservation Areas (Costa Rica)
ST REDD+	REDD+ Technical Secretariat (Cameroon)
UMD	University of Maryland
UNFCCC	United Nations Framework Convention on Climate Change
UNREDD	United Nations REDD+ Program
US EPA	US Environmental Protection Agency
USAID	US Agency for International Development
USCF	Remote Sensing and Statistical Operational Unit (Cameroon)
USDA	US Department of Agriculture
USFS	US Forest Service
USG	US Government
USGS	US Geological Survey
WCS	Wildlife Conservation Society
WRI	World Resources Institute

## Introduction

### SilvaCarbon Overview

SilvaCarbon is an interagency technical cooperation program of the US Government (USG) to enhance tropical forested countries' capacity to monitor, measure, and report on carbon in their forests and other lands. SilvaCarbon draws on the strengths of multiple USG agencies and partners to advance the generation and use of improved information related to forest and terrestrial carbon. The program was initiated in 2011 and has since collaborated with 25 tropical forested countries across Africa, Asia, and Latin America.

USG agencies that have contributed to SilvaCarbon include the US Agency for International Development (USAID), US Department of State (DOS), US Forest Service (USFS) under the US Department of Agriculture (USDA), US Geological Survey (USGS), US Environmental Protection Agency (EPA), National Aeronautics and Space Administration (NASA), US Foreign Agricultural Service (FAS) under USDA, National Oceanic and Atmospheric Administration (NOAA), and the Smithsonian Institution. Program funding is provided by USAID and DOS and program implementation is led by USFS and USGS.

SilvaCarbon is the USG contribution to the Global Forest Observations Initiative (GFOI) and currently co-manages the GFOI Capacity Building Component and the GFOI Data Component. GFOI is an informal partnership to help coordinate international support to developing countries on forest monitoring and related activities. GFOI is led by the governments of Australia, Germany, Norway, the United Kingdom, and the US as well as the international Committee on Earth Observation Satellites (CEOS), the European Space Agency (ESA), the Food and Agriculture Organization of the United Nations (FAO), and the World Bank.

Following nearly a decade of successful collaboration, SilvaCarbon is beginning a new five-year phase for fiscal years 2020-2025 (FY20-25). The strategy outlined in this document provides a roadmap to guide the program through the next phase and inform the development of annual work plans to be implemented during that period. The strategy reflects the current priorities and ambitions of the USG agencies that contribute to SilvaCarbon and the countries and other partners with which it works. The strategy is subject to change based on evolving factors such as funding availability and country needs.

### Background

Tropical forest loss remains a critical challenge globally. Ongoing deforestation and forest degradation adversely impact people, economies, and biodiversity throughout the tropics while contributing up to 20 percent of global greenhouse gas (GHG) emissions. In 2019 the tropics lost 11.9 million hectares of tree cover, representing at least 1.8 gigatonnes of carbon.<sup>1</sup> Tropical forest loss reached the highest level recorded in 2016, and in 2018 the tropics lost over 12 million hectares of tree cover including 3.6 million hectares of primary rainforest, or an area the size of Belgium. The unprecedented and widely publicized fires impacting the Amazon in recent years exemplify the many growing threats to tropical forests and demonstrate the need for strategic, long-term intervention to conserve and sustainably manage critical forest landscapes.

In order to reduce tropical forest loss and associated GHG emissions, decision makers, stakeholders, and the public must have access to transparent, accurate information about when and where forest loss is occurring and how it impacts carbon stocks and emissions. Forest and landscape monitoring is essential for developing

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<sup>1</sup> [Global Forest Watch](#), 2020.

evidence-based conservation policies and strategies, strengthening land use management and planning, unlocking sustainable development financing through REDD+ and other mechanisms, and demonstrating and reporting commitments and progress and under multilateral frameworks and agreements. Forest monitoring data can also support and enhance forest restoration and reforestation, particularly as global interest and investment in large-scale restoration and reforestation increases (e.g. the Trillion Trees Initiative).

Despite global trends, a number of individual countries have seen recent reductions in forest loss. These successes are largely due to improved conservation policies, strategies, and actions implemented in tandem with improved forest and landscape monitoring. Many tropical forested countries have committed to establishing National Forest Monitoring Systems (NFMS) that include Measurement, Reporting, and Verification (MRV) components, as is required for participation in REDD+ and other performance-based conservation and development initiatives. MRV systems integrate remote sensing data with ground-based forest inventory data to generate national GHG inventories for the land sector. National GHG inventories for the land sector serve multiple objectives, including enabling countries to participate in REDD+, meet international reporting requirements, and inform current and future efforts to curb forest loss and GHG emissions.

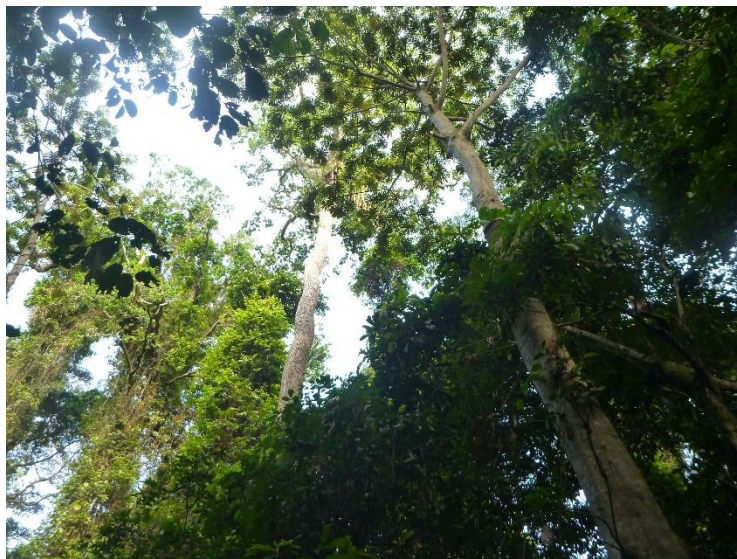


Figure 1: Forest canopy in the Republic of the Congo

Developing countries seeking results-based payments under REDD+ and similar programs must meet strict program requirements for data transparency, accuracy, consistency, and other metrics. Many countries need international support to achieve their goals. The process of collecting, analyzing, and integrating monitoring and MRV data as required is complex and difficult, and the process can be further complicated when different monitoring and MRV functions fall under different government ministries or when clear, robust institutional arrangements are lacking.

While emerging remote sensing technologies and satellite data present tremendous opportunities for forest and landscape monitoring and MRV, they require significant technical capacity to use effectively. Developing countries face challenges identifying and adopting technologies appropriate to their national circumstances, establishing effective data-sharing mechanisms, and tailoring their monitoring and MRV approaches to meet the reporting requirements and technical guidelines established by the international community, which are continuously updated. SilvaCarbon collaborates with selected tropical forested countries to help overcome these and other challenges by providing targeted technical support based on national needs.

Over the past decade SilvaCarbon country partners have made impressive progress in developing NFMS and MRV systems. All SilvaCarbon countries are now able to track large-scale deforestation and generate forest carbon data consistent with minimum standards required for international reporting. A number of SilvaCarbon countries, such as Colombia, have become regional leaders in forest monitoring and are increasingly sharing their expertise and experience with regional counterparts. Other countries, such as Vietnam, are poised to begin receiving results-based payments for REDD+ as they continue to improve their NFMS and MRV systems.

Yet significant challenges remain, and further support is needed to help countries accelerate progress and achieve self-reliance. Continued support from SilvaCarbon over the next five years will assist countries to fully operationalize their NFMS and MRV systems, develop the in-house capacity to independently improve their capabilities over time, and secure the technical and financial resources needed to sustain their efforts with reduced reliance on external donor support.

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At the same time, the metrics for success are changing and country ambitions are rising. For example, many SilvaCarbon partner countries have successfully established processes for monitoring large-scale deforestation and have since moved on to the more difficult task of monitoring forest degradation. Some countries are now starting to explore options for monitoring large-scale forest restoration, an even more complex but important task. These increasing efforts are laudable and should continue to be supported by the international community, particularly as countries must also take into account continuously updated reporting requirements and emerging technologies. SilvaCarbon partner countries have shown significant adaptability and perseverance in the face of shifting milestones and are well-positioned to leverage SilvaCarbon support to achieve even greater success in coming years.

A key focus for SilvaCarbon over the next five years is to support partner countries to improve the quality and availability of forest data for decision-making, and to use existing data that was initially generated for reporting purposes to inform decision-making processes. As countries increase their reporting capabilities through the production of more and better data, new opportunities are emerging to apply this data toward other objectives. Forest monitoring data can directly inform a variety of natural resource management and conservation decision-making processes, including, for example, the identification of priority areas for forest restoration and reforestation. In its next phase SilvaCarbon will work strategically to develop country capacities to produce and use forest monitoring data to improve resource management and reduce forest loss, in addition to improving forest reporting.

**Box 1. From Reporting to Decision-Making**

SilvaCarbon countries have made impressive progress in generating forest monitoring data required for international reporting purposes. The next step is to further integrate these data in national decision-making processes to improve resource management and reduce forest loss.

Country partners are at different stages of NFMS and MRV development, have different needs and objectives, and may be working with a variety of different international donors. SilvaCarbon is well-positioned to help identify and address priority needs and capacity gaps. In addition, in FY21 the program is adopting a systematic approach to country needs assessment that will allow for enhanced tracking of countries' progress over time. As country partners continue to make NFMS improvements with support from SilvaCarbon and others, SilvaCarbon will monitor progress using a practical framework and provide targeted, coordinated programming to ensure country partners follow a strategic, cost-efficient trajectory for NFMS and MRV development.

## Programmatic Approach

### Collaboration and Coordination

SilvaCarbon works closely with a wide variety of national, regional, and international partners to achieve results. Key program partners include:

- USG Agencies: SilvaCarbon is jointly led by USAID, DOS, USFS, and USGS. Other USG contributors include EPA, NASA, and FAS. NOAA and Smithsonian Institution have contributed in the past and may re-engage in the future. SilvaCarbon also maintains a strong ongoing partnership with SERVIR, a joint NASA-USAID initiative.
- Country Partners: SilvaCarbon supports institutions in partner countries that are responsible for national-level forest and landscape monitoring. These primarily include government entities such as forestry departments, mapping authorities, space data agencies, and REDD+ units, in addition to national universities and NGOs engaged in national monitoring efforts.
- Academia: SilvaCarbon partners with a number of academic institutions at the cutting edge of forest monitoring research, technology, and training. These include the University of Maryland (UMD), Boston University (BU), Wageningen University, the University of California-Los Angeles (UCLA), Colorado State University (CSU), McGill University, and Oregon University, as well as numerous local universities in SilvaCarbon partner countries.
- Global Forest Observations Initiative (GFOI): As the USG contribution to GFOI, SilvaCarbon is represented in GFOI leadership, co-manages the GFOI Capacity Building and Space Data components, and regularly coordinates with GFOI partners and the GFOI Office in work planning and activity implementation.
- Donors and Multilaterals: SilvaCarbon coordinates and collaborates with a variety of international organizations to achieve shared goals. These include FAO, UN-REDD, United Nations Framework Convention on Climate Change (UNFCCC), World Bank, and German development agency (GIZ). Much of this coordination and collaboration takes place through SilvaCarbon's participation in GFOI.
- NGOs: SilvaCarbon partners with organizations such as the World Resources Institute (WRI), Center for International Forestry Research (CIFOR), and Tropical Agricultural Research and Higher Education Center (CATIE), and Coalition of Rainforest Nations to better support individual countries and strengthen forest monitoring globally.
- Private Companies: SilvaCarbon maintains a strong technical partnership with Google Earth Engine, and works with other key companies such as space data providers (e.g. Planet) and tool developers (e.g. Spatial Informatics Group, the Mullion Group) to help countries meet their specific monitoring needs.

### Targeted Technical Support

SilvaCarbon provides targeted technical support to assist partner countries in the development and implementation of NFMS and related processes, with particular emphasis on MRV. MRV systems are comprised of three main components: Remote Sensing, Forest Inventory, and GHG Inventory. SilvaCarbon works with countries to build capacities across all three components and to integrate each in holistic, sustainable NFMS that support multiple objectives (Figure 2).



Figure 2: SilvaCarbon primary technical support areas

- Remote Sensing:** Remote sensing is the process of detecting and monitoring the physical characteristics of an area at a distance, typically from satellite or aircraft. New remote sensing technologies and satellite data provide powerful, cost-effective tools for tracking forest cover and land use change such as deforestation, particularly over large and inaccessible areas. By providing remote sensing expertise from USGS, USFS, NASA, and other partners, SilvaCarbon helps countries adopt cutting-edge remote sensing tools and data to increase monitoring capabilities and reduce costs. SilvaCarbon also works with GFOI partners to increase the availability and use of Earth observation data globally.
- Forest Inventory:** Forest inventory is the systematic collection of data on the forest resources within a given area at a specified point in time. Regular forest inventories are essential for determining forest carbon stocks, “ground-truthing” remotely sensed data with ground-based measurements, and assessing other vital ecological and resource values necessary for sustainable forest management. SilvaCarbon draws on the forestry expertise of the USFS and other partners to build country capacities to design and implement robust National Forest Inventories (NFI) that can support a variety of country priorities, including both carbon and non-carbon objectives.
- GHG Inventory:** GHG inventories identify the major sources and sinks of GHG and estimate the amount of GHG emitted or removed. In tropical developing countries, deforestation and forest degradation often represent the largest source of overall emissions. Many tropical developing countries are committed to transparency and accountability through the tracking and reporting of GHG emissions from the Agriculture, Forestry, and Other Land Use (AFOLU) sector. Through SilvaCarbon, US and international GHG inventory experts assist countries to develop credible AFOLU GHG inventories consistent with the latest methods and international reporting requirements.

Programming in these three areas is designed to address technical needs and gaps that evolve as countries progress in the NFMS and MRV development process, from basic monitoring to robust monitoring to full country ownership and sustainability, i.e., self-reliance (Figure 3).

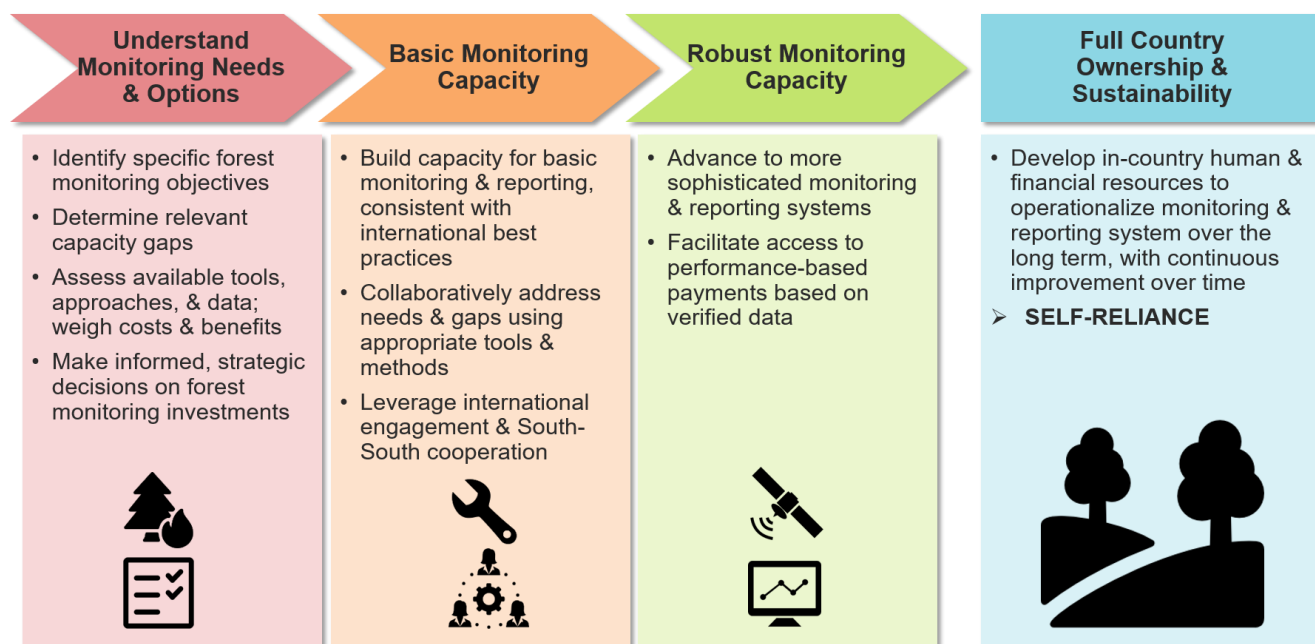


Figure 3: SilvaCarbon capacity-building process

## Core Principles

SilvaCarbon is grounded in four core principles central to all aspects of its work:



**Transparency.** Governments work with SilvaCarbon with full understanding that the forest monitoring data generated through their collaboration is to be made publicly available. Data transparency in the forestry and land use sector builds trust; levels the international playing field for trade and investment, particularly with respect to illegal logging and timber trafficking; and supports civil society to hold government accountable.



**Sustainability.** SilvaCarbon fosters sustainability through self-reliance. Program activities are designed to assist partner governments to build their own in-house technical capacity, minimize dependence on donor support and repeat consultancies for routine monitoring tasks, and establish permanent institutional arrangements for resilient monitoring systems that can endure government turnover and temporary funding shortfalls. SilvaCarbon also supports sustainability through South-South technical exchange across countries and regions. As countries gain forest monitoring experience and expertise they become technical resources in their own right, and through SilvaCarbon are able to serve as partners for technology transfer with other countries facing similar technical challenges. In addition, SilvaCarbon helps countries develop effective and sustainable expertise in forest monitoring by focusing on gender integration and supporting the professional development and engagement of women in NFMS processes.



**Cost-Effectiveness.** SilvaCarbon has contributed to a significant amount of leveraged funding and continues to prioritize responsible stewardship of program resources. Program partners note that SilvaCarbon has achieved an outsized impact relative to its modest funding levels. This is due in part to its emphasis on joint activity implementation, in-kind contributions of staff time from USG agencies, and long-standing relationships of mutual trust with diverse partners. Cost-effectiveness is also a

priority for SilvaCarbon country partners who operate in developing economies and have limited access to financial resources for forest monitoring. SilvaCarbon technical support and guidance focuses explicitly on reducing long-term monitoring costs and encourages the use of free and open-source tools and methods over costly proprietary options whenever feasible.



**Coordination.** SilvaCarbon was designed as a USG coordination mechanism to synergize efforts and resources across multiple USG agencies. This built-in coordination enables SilvaCarbon to efficiently channel USG capabilities to respond to country needs, avoid duplicated efforts, and provide consistent USG guidance and messaging to international partners. Strong coordination has been cited as a key strength of the program, and according to a mid-term program evaluation it contributes to a positive, user-friendly approach on the part of program beneficiaries. Coordination has improved as the program has matured, and SilvaCarbon agencies have established formal and informal processes to ensure coordination as reflected in joint work plans, integrated program reporting, and close, regular communication among program partners. Coordination with USAID Mission programming and DOS global programming ensures linkages and complementarity with other USG efforts in partner countries and will remain a priority in SilvaCarbon’s next phase. In addition to USG coordination, SilvaCarbon coordinates closely with GFOI and its constituent partners to harmonize capacity-building and communication efforts internationally.

## Organizational Structure

SilvaCarbon is led by an interagency Steering Committee comprised of representatives from USG SilvaCarbon agencies. Current active Steering Committee members include USAID, DOS, USFS, USGS, NASA, and EPA. Other USG agencies contribute to SilvaCarbon leadership through technical and strategic input and participate in selected program activities. SilvaCarbon is funded by USAID and DOS and implemented by USFS and USGS.

SilvaCarbon activities are planned, coordinated, and conducted through dedicated sub-programs for the Africa region, the Asia-Pacific region, the Latin America and Caribbean (LAC) region, and the Global Program (Figure 4). Regional sub-programs are managed by dedicated USG program managers who work closely with counterparts in each region to identify and address country-specific needs. USAID Missions may “buy in” to SilvaCarbon by allocating Mission funding to implement SilvaCarbon programming in individual countries and regions, working directly with SilvaCarbon regional program managers to develop work plans focusing on shared priorities. The Global Program provides direction and support to regional teams, serves as a centralized secretariat for the program as a whole, and conducts international activities that complement and enhance regional and bilateral activities.

In the three regions SilvaCarbon benefits from locally-based USFS staff, including in-country program coordinators and technical advisors. In-country staff ensure coordination and linkages with other initiatives (including USAID Mission programming and DOS global programming), maintain productive working relationships with local partners, and provide on-the-ground perspective and logistical support for activity implementation. This allows SilvaCarbon to maintain a strong presence around the globe and enables Regional Programs to flexibly respond to evolving country conditions. In-country support is particularly valuable during the COVID-19 pandemic as it allows locally-based programming to continue despite international travel restrictions.

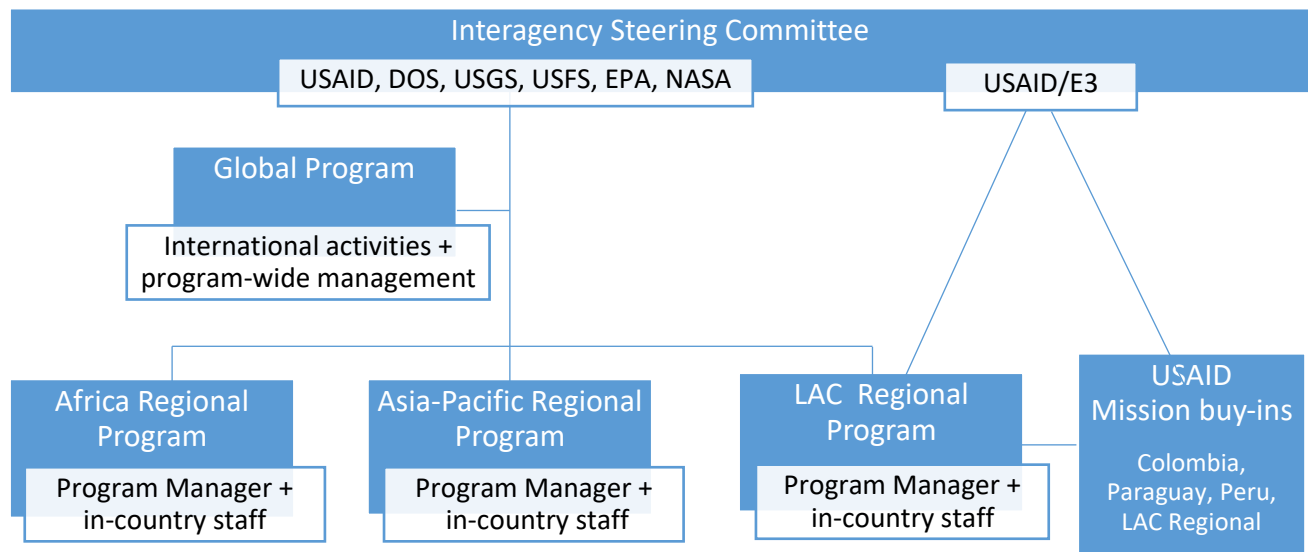


Figure 4: SilvaCarbon organizational structure

## Pathways for Achieving Results

SilvaCarbon strives to achieve the results and impact described in the SilvaCarbon Results Chain (Figure 5). The Results Chain articulates the program’s short-term Outputs, medium-term Outcomes, and desired long-term Impact.

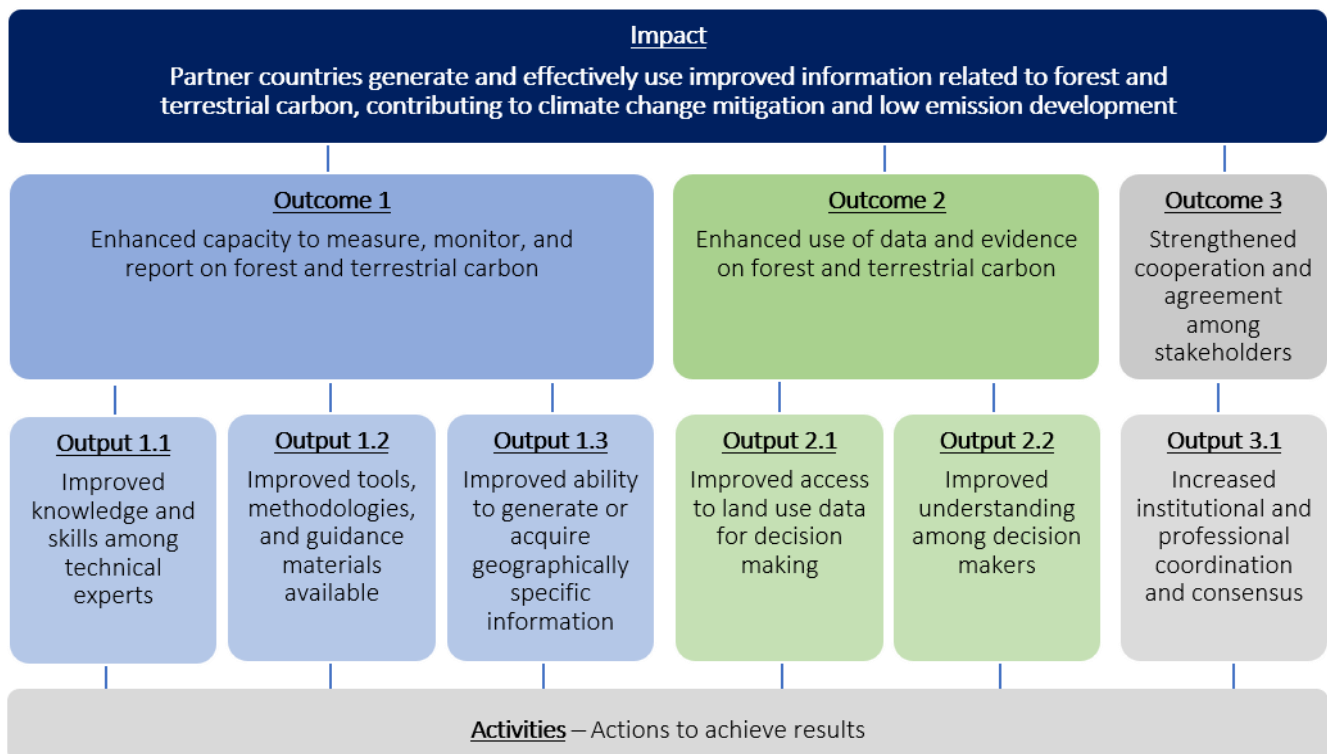
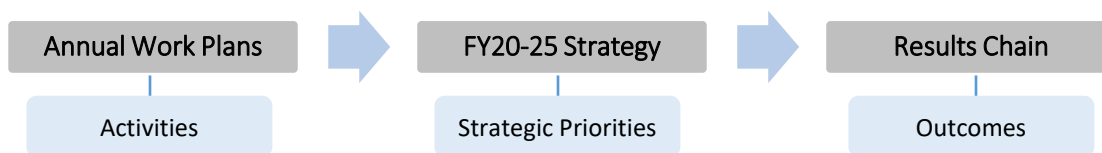


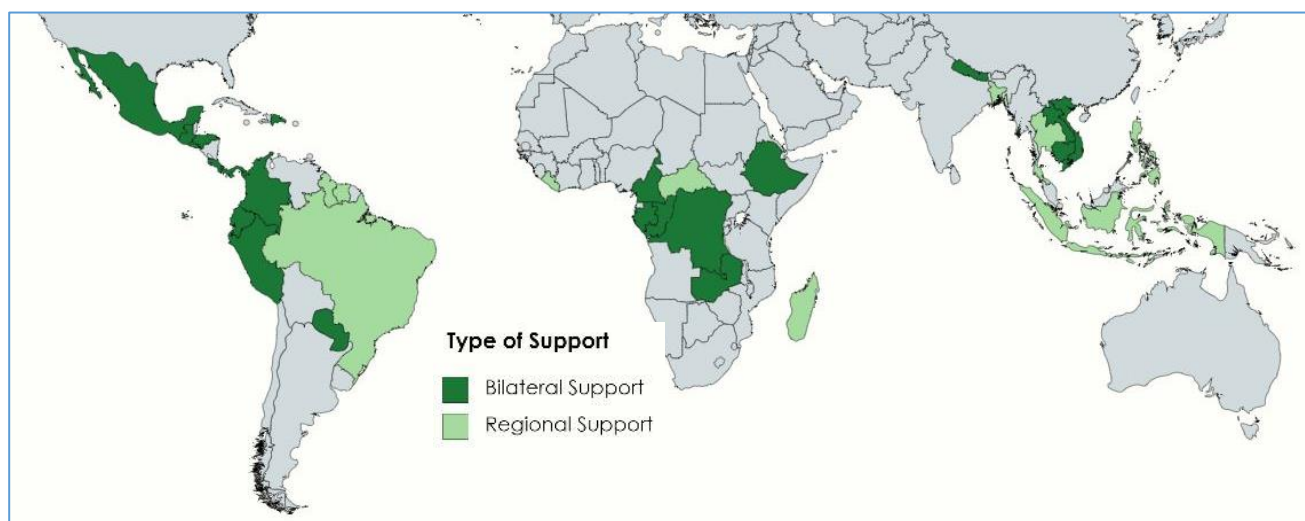
Figure 5: SilvaCarbon Results Chain

This FY20-25 Strategy establishes region-specific Strategic Priorities pursuant to the Outcomes in the Results Chain. During the FY20-25 period, annual Work Plans will be developed with activities pursuant to each Strategic Priority. The relationship between annual Work Plans, the FY20-25 Strategy, and the Results Chain can be summarized as follows:



## Country Engagement

SilvaCarbon anticipates engaging 30 tropical forested countries in the FY20-25 strategy period. Country engagement will consist of a combination of bilateral and regional support and additional collaborative support with key partners (e.g. SERVIR).



*Figure 6: Anticipated geographic scope of SilvaCarbon programming in FY20-25*

The below table provides a snapshot of anticipated SilvaCarbon support at the country level. The table includes additional information about country participation in related programs and initiatives, key SilvaCarbon partners in each country, and the primary SilvaCarbon Outcomes to be addressed in each country. Further details are described in subsequent regional sections of this document.

### Anticipated SilvaCarbon Support by Country in FY20-25

Country	(B)ilateral / (R)egional Support	USAID Mission Buy-In <sup>2</sup>	FCPF <sup>3</sup> country	ISFL <sup>4</sup> country	FREL <sup>5</sup> submitted	Key Partners	Outcomes to be addressed (from Results Chain)		
							1	2	3
AFRICA									
Cameroon	B, R		Y			ONACC; MINFOF: SDIAF; ST REDD+; CARPE	Y	Y	Y
Central African Rep.	R		Y			University of Bangui; MEDD; Ministry of Water and Forest			Y
Dem. Rep. of Congo	B, R		Y		Y	MEDD: DIAF; DDD; FONAREDD; FAO; UMD; CARPE; CRfN; UNIKIN; UNIKIS; ERIAFT; Uni of Lubumbashi	Y	Y	Y
Ethiopia	B, R		Y	Y	Y	EFCCC; OFLP; MoA; CSA; LFSDP; World Bank; Unique Forestry and Landuse	Y	Y	Y
Gabon	B, R		Y			AGEOS; Ministry of Water and Forests	Y		
Liberia	R		Y		Y	FDA; LFSP			Y
Madagascar	R		Y		Y	BN-CCCREDD+; Uni Antananarivo			Y
Rep. of Congo	B, R		Y		Y	CNIAF; MoE; FAO; CRfN; Marien Ngouabi University; REDD+ Coordination; CARPE; UMD	Y	Y	Y
Zambia	B, R			Y	Y	Forestry Department; ZEMA; Dept of Livestock; Dept of Agriculture; ZamStat; USAID; World Bank/BioCF	Y	Y	Y
ASIA									
Bangladesh	R				Y	SERVIR-HKH, COMPASS, Bangladesh Forest Department			Y
Cambodia	B, R		Y (ending in FY21)		Y	Ministry of Environment, Ministry of Agriculture Forestry and Fisheries, SERVIR-Mekong, FCPF, FAO, Royal University of Agriculture	Y	Y	Y

<sup>2</sup> “Y” denotes USAID Missions that have formalized SilvaCarbon agreements as of November 2020; other Mission buy-ins may be implemented at a later date

<sup>3</sup> Forest Carbon Partnership Facility (FCPF); “Y” denotes country participation in FCPF as of November 2020

<sup>4</sup> Biocarbon Fund Initiative for Sustainable Forest Landscapes (ISFL); “Y” denotes country participation in ISFL as of November 2020

<sup>5</sup> Forest Reference Emission Level (FREL); “Y” denotes country has submitted its national FREL as of November 2020

Fiji	R		Y		Y	Ministry of Forestry, GiZ, JICA	Y		Y
Indonesia	R		Y	Y	Y	Ministry of Environment and Forestry, ISFL Jambi, FAO	Y		Y
Lao PDR	B, R		Y		Y	Ministry of Agriculture and Forestry, National University of Laos, JICA, EC-JRC, GiZ, RECOFTC	Y	Y	Y
Nepal	B, R		Y		Y	Ministry of Forests and Environment, SERVIR-HKH	Y	Y	Y
Philippines	R					Forest Management Bureau, Central Mapping Agency		Y	Y
Thailand	R		Y			Ministry of Natural Resources and Environment, FAO			Y
Vietnam	B, R		Y		Y	Forest Inventory and Planning Institute, Ministry of Natural Resources and Environment, SERVIR-Mekong, Vietnam Forestry University	Y	Y	Y
LATIN AMERICA AND THE CARIBBEAN									
Brazil	R				Y	SERVIR			
Colombia	B, R	Y	Y	Y	Y	Institute of Hydrology, Environmental Sciences, and Meteorology (IDEAM)	Y	Y	Y
Costa Rica	B, R		Y		Y	REDD+ Secretariat; CENIGA; National Forestry Financing Fund (FONAFIFO); National Meteorological Institute (IMN); National System of Conservation Areas (SINAC)	Y		Y
Dominican Rep.	R		Y		Y	Ministerio de Medio Ambiente y Recursos Naturales (MARN)			Y
Ecuador	B, R	Y			Y	Ministry of the Environment (MAE)	Y	Y	Y
El Salvador	B, R		Y			Ministry of Natural Resources (MARN); Ministry of Agriculture (MAG)	Y	Y	
Guatemala	B, R		Y			Inter-institutional Mapping Group (GIMBUT)	Y	Y	Y
Guyana	R		Y		Y	SERVIR			
Honduras	B, R		Y		Y	Forestry Conservation Institute (ICF)	Y	Y	Y
Mexico	B, R		Y	Y	Y	Forest Service (CONAFOR)		Y	Y
Panama	B, R		Y		Y	MiAmbiente	Y		Y
Paraguay	B, R	Y	Y		Y	Forest Service (INFONA); Ministerio del Ambiente y Desarrollo Sostenible (MADES)	Y	Y	Y
Peru	B, R	Y	Y		Y	Forest Service (SERFOR); Ministerio del Ambiente (MINAM); Instituto de Investigaciones de la Amazonia Peruana (IIAP)	Y	Y	Y
Suriname	R		Y		Y	SERVIR			

## Illustrative Results

The following are selected examples of past results achieved through SilvaCarbon support. These results are provided for context to help illustrate the types of support SilvaCarbon offers. Additional results are described in subsequent sections of this document.

### Global Level Results – Illustrative Examples

- 25 countries with accurate and sustainable National Forest Inventory (NFI) methods
- 21 countries with upgraded, cost-efficient remote sensing tools
- 13 countries with enhanced international GHG reporting capabilities (improved from IPCC Tier 1 to Tier 2)
- 14 countries developed and submitted Forest Reference Emission Levels (FRELs) for assessing REDD+ performance
- 24 countries received complete archives of Landsat Earth observation data (2011-2019)
- Collect Earth Online, a free, user-friendly platform for collecting and analyzing satellite data for forest monitoring applications, was developed in collaboration with partners and is now widely used globally (2019)

### Country Level Results – Illustrative Examples

- Vietnam compiled its national GHG inventory for the land sector using freely available tools (2015-2019), implemented an enhanced NFI (2018-2019), and is now ready to receive results-based payments for REDD+ activities (2020)
- Bangladesh established its first NFI (2014-2019)
- Nepal produced high quality annual forest cover change maps for the 2000-2016 period (2018-2019)
- Peru developed an early alert system for detecting deforestation by building on SilvaCarbon technical support provided since 2012 (2019)
- Peru completed its first large-area forest change map and first phase of its NFI (2014)
- Colombia generated its first annual estimates of forest cover change and first NFI design (2015)
- The Democratic Republic of the Congo incorporated peatlands in its NFI (2018)
- The Republic of the Congo produced a high quality forest cover change map for the period of 2000-2014 (2014)

## Africa Strategy

### Background

SilvaCarbon programming in Africa was initiated in 2011 with activities concentrated in the Central Africa region. During the previous strategy period (FY17-FY19) this support primarily focused on the Congo Basin region, namely Cameroon, the Democratic Republic of the Congo (DRC), Gabon, and the Republic of the Congo (RoC), due to the region's global significance hosting the second largest tropical forest in the world. The Congo Basin forest provides numerous environmental services, including climate regulation; harbors tremendous biodiversity; and supports the livelihoods of local communities across the continent. Increasing population density, expansion of shifting cultivation, illegal logging and mining, agriculture concessions, and woodfuel production are some of the many threats that contribute to deforestation and degradation in the region. In FY19 SilvaCarbon began implementing programming in Ethiopia and Zambia specifically focused on supporting engagement with the BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL).

FY20 is the first year there has been an Africa Program Manager for the SilvaCarbon program. While programming across the region was naturally consolidating with similar activities being implemented in each of the countries, the addition of this new position, in conjunction with the new FY20-25 Strategy, will further streamline and harmonize SilvaCarbon efforts in Africa for greater impact.

The aim of the FY20-25 Strategy is to build upon past SilvaCarbon programming, expanding the scope to better address some of the key systemic challenges countries face in building technical capacities and moving towards self-reliance (Box 2). SilvaCarbon programming will continue to play a complementary role to other programs and technical partners in the region (Box 3), leveraging USG expertise to address specific technical needs and gaps in broader national processes.

The SilvaCarbon Africa program greatly benefits from in-country USFS Country Coordinators and embedded technical advisors. These positions allow for increased engagement with partners in the field and active representation and participation in national processes. Currently there are Country Coordinators placed in Cameroon, DRC and RoC; a Department of State Climate Fellow in RoC; and two USAID-supported technical embedded advisors in the Zambia Environmental Management Agency and the Zambia Forestry Department (Figure 7).

#### Box 2. Approaches to move towards self-reliance

1. Draw on local experts and promote south-south exchanges where possible
2. Improved data management and storage systems for increased transparency
3. Strengthening of institutional arrangements, including development of Standard Operating Procedures
4. Increase pool of experts in the region with a focus on women; support mentorship where appropriate
5. Establish methodology to better track country advancement in technical capacity resulting from SilvaCarbon technical assistance

### Box 3. Complementary Programming and Partners\*

BioCarbon Fund Initiative for Sustainable Forest Landscapes	Japan International Cooperation Agency
Boston University	McGill University
CCAFS/Unique Forestry and Land Use	Oregon State University
Central Africa Forests Commission (COMIFAC)	Satellite Observatory for the Forests of Central Africa (OSFAC)
Central Africa Forest Initiative	SERVIR hubs
Coalition for Rainforest Nations	Spatial Informatics Group
Colorado State University	The Carbon Institute
DOS Climate Fellows program	United Nations Environment Programme
EPA Transparency Accelerator program	University of Maryland
Food and Agriculture Organization of the United Nations	UN REDD Programme
Forest Carbon Partnership Facility	USAID CARPE program
French Development Agency Afd	USAID Zambia embedded advisors
GEF 7 Congo Basin Sustainable Landscapes (CBSL)	Wildlife Conservation Society
German Agency for International Cooperation GIZ/KfW	World Bank
Global Forest Observations Initiative (GFOI)	World Resources Institute
Global Peatland Initiative	World Wildlife Fund for Nature
Google Earth Engine (GEE)	

\*Does not include program country Government or national/local University Partners; may not be a comprehensive list

## Focal Countries

For the FY20-FY25 period SilvaCarbon programming in Africa will focus on the following countries:

### Country-Specific Programming:

- **Cameroon**
- **Democratic Republic of the Congo (DRC)**
- **Ethiopia – ISFL support**
- **Gabon**
- **Republic of the Congo (RoC)**
- **Zambia – ISFL support**

### Regional Programming Only:

- **Central African Republic (CAR)**
- **Liberia**
- **Madagascar**

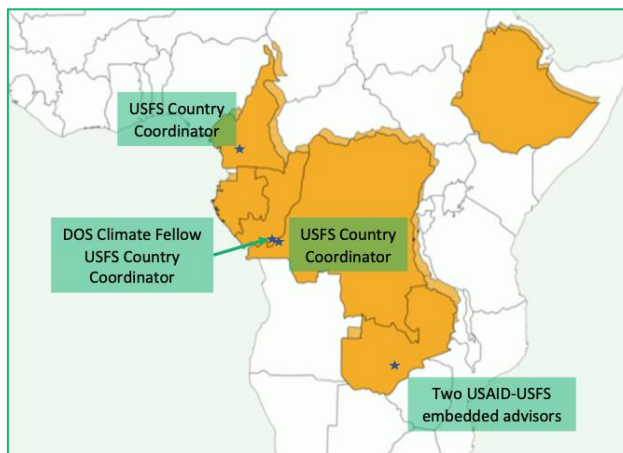


Figure 7. Coordinators and technical advisors based in the core SilvaCarbon Africa countries.

## Support to Date

The SilvaCarbon Africa program has been working primarily with national governments in Central Africa to support the establishment and operationalization of their NFMS including support to national forest inventories (NFIs), remote sensing capabilities and analysis, and national GHG inventories. In all countries SilvaCarbon support has played a complementary role to other technical partners and programs, providing targeted technical assistance to address key gaps and increase overall impact (see Box 2).

Capacity development has been a key component in all SilvaCarbon activities. To date, support in Africa has primarily addressed Outcomes 1 and 3 in the SilvaCarbon results chain, with greater emphasis on Outcome 1: *Enhanced capacity of partner countries to measure, monitor, and report on forest and terrestrial carbon, contributing to sustainable, Intergovernmental Panel on Climate Change (IPCC) compliant forest and landscape monitoring and reporting systems and GHG inventories*<sup>6</sup>.

This support has focused predominately in the following areas:

1. Enhancing NFI design, implementation and data analysis, including a focus on peatland and mangrove forests;
2. Reinforcing national forest monitoring through trainings and mentoring on creating land use and cover change maps, detecting forest cover change, and estimating forest degradation;
3. Preparing and collecting data to compile national GHG inventories and analyzing emissions and sinks;
4. Capacity development on terrestrial carbon accounting; and
5. Supporting the ISFL program to meet emission reduction requirements in Ethiopia and Zambia.



Figure 8. Carbon accounting training in the Congo



Figure 9. Measuring peat carbon in the Congo



Figure 10. SilvaCarbon Africa partners and program staff in Washington, DC

<sup>6</sup> SilvaCarbon M&E Plan and Framework, 2017.

A number of notable successes have been achieved through SilvaCarbon's collaboration with other partners and programs in Africa (Box 4). In the FY17-FY19 period these included:

- Over 200 government officials, university professors, and technical partners trained in terrestrial carbon accounting, forest inventory methodologies, and forest monitoring throughout the region.
- Teams of remote sensing technicians across the region trained on estimating land cover change and forest cover change in partnership with USGS, USFS, University of Maryland and other technical partners (FAO, JICA, WWF, etc).
- Technical support and training for the establishment of the national FRELS in Cameroon, DRC and RoC.
- Technical support and trainings for the establishment of the NFMS in Cameroon.
- RoC MRV taskforce established and is currently being mentored and trained by the Department of State's Climate Fellow in RoC in place since 2018.
- A series of trainings with the Carbon Institute has trained 88 professors, ministry officials and technical experts in the region on the basics terrestrial carbon accounting.
- NFI data collection and analysis support has informed NFI methodology and analysis with south-south trainings in the two Congos on integration of wetlands (peatland and mangrove) forests into NFIs.
- In Cameroon support to new NFI preparation phase including: developing NFI roadmap and budget, elaborating methodologies and facilitating trainings.
- Currently all three Central African SilvaCarbon countries are receiving SilvaCarbon support to include forest degradation in forest cover change estimates and to update their national FRELS.
- South-South exchange between six francophone African countries to share experiences and lessons learned on establishing and operationalizing their monitoring reporting and verification systems.
- Tier 2 compliant activity data collected and emission factors developed for the forestry sector in Zambia.

#### Box 4. Partner Success Stories – Africa

**Impact Report 2016-2019: SilvaCarbon Africa Program** - Summary of achievements in Africa during the FY17-FY19 period

##### Carbon accounting trainings

- [https://usfscentralafrica.org/wp-content/uploads/2019/02/SS\\_Carbon-Institute.pdf](https://usfscentralafrica.org/wp-content/uploads/2019/02/SS_Carbon-Institute.pdf)
- <https://youtu.be/OnwKgM9Ilys>
- <https://carboninstitute.org/africa-carbon-accounting/>

##### Inclusion of peatland in NFIs

- [https://usfscentralafrica.org/wp-content/uploads/2018/04/SS\\_Peatland\\_Final.pdf](https://usfscentralafrica.org/wp-content/uploads/2018/04/SS_Peatland_Final.pdf)
- <https://youtu.be/WFkvppkXxhM>
- <https://youtu.be/rukp8JFRwGE>

##### Forest cover mapping

- <https://youtu.be/V507qyRNtZI>

## Vision for 2025

Based on opportunities and challenges identified to date, the SilvaCarbon Africa Program will work toward the following Vision for 2025, pursuant to the overarching impact from the SilvaCarbon Results Chain.

- ❖ **SilvaCarbon partner countries in Africa will have established institutional arrangements, national systems, and a cadre of local experts in the region to track and report on land cover change and resulting GHG emissions**
- ❖ **SilvaCarbon partner countries in Africa will have enhanced data, data management, and information communication for improved decision making, transparency, and policy processes**

## Strategic Priorities and Expected Milestones

To realize this Vision, the Africa Program will focus on the following Strategic Priorities and Expected Milestones during the FY20-25 period in accordance with the Outcomes and Outputs from the SilvaCarbon Results Chain.

### **Outcome 1**

#### ➤ **Africa Strategic Priority 1.A: Improve compliance of national reporting with UNFCCC requirements by continuing to strengthen and operationalize NFMS and improve national GHG inventories.**

SilvaCarbon will continue to build the capacity of national governments to measure, monitor, and report on terrestrial carbon. Continuation of previous SilvaCarbon support to governments will proceed in partnership with other technical programs and partners. This work includes but is not limited to:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>- Mapping forest and land cover change and forest degradation;</li> <li>- Updating and submission of FRELs;</li> <li>- Technical input to NFI design, methodology, data collection and data analysis, including analytical tools;</li> <li>- Strengthening arrangements and improving quality of GHG inventories included in current reports (Biennial Update Reports and National Communications) with an aim to prepare for future reporting under the Enhanced Transparency Framework (ETF)</li> <li>- Supporting the operationalization of NFMS/MRV including strengthening institutional arrangements (see Africa Regional Priority 2);</li> <li>- Assessment and upgrading of data management systems and protocols;</li> <li>- capacity building and technology transfer on specific monitoring and measuring tools and methods/techniques;</li> <li>- Piloting community-based monitoring methods; and</li> <li>- Estimating GHG emissions/removals for results-based payments for Emission Reduction Programs.</li> </ul> | <p style="text-align: center;"><b>Beneficiaries</b></p> <ul style="list-style-type: none"> <li>- National government technical units, e.g. inventory and geomatic units</li> <li>- University professors and students</li> <li>- National and regional technical-subject matter experts</li> <li>- Local communities (community-based monitoring)</li> <li>- Emission reduction programs</li> </ul> |
|---|---|

Technical support in these areas will help to ensure continuous improvement in data generation, management and analysis to meet UNFCCC reporting requirements. Where relevant and possible, local experts will be drawn upon and mentored, playing an active role in training and capacity development activities. South-south exchanges will also help to further regional sharing of best practices and lessons learned. For example, AGEOS has well-equipped labs to host regional exchanges, technical and scientific workshops. SilvaCarbon plans to work with AGEOS to facilitate a common platform for the countries of the Congo Basin forests, to create a scientific committee on common issues related to forest change, and to provide regional training on other priorities of SilvaCarbon such as GHG inventory techniques.

#### ➤ **Africa Strategic Priority 1.B: Strengthen monitoring and MRV institutions and support the development of standard operating procedures with a focus on data management and access.**

Although each country in the Congo Basin countries has its own specific national circumstances, the reporting challenges are quite similar. Most of the countries lack clear institutional arrangements with

autonomous operating units and legal frameworks to ensure continuous GHG emission/removal monitoring, measuring, and reporting. Existing reporting frameworks are mostly project-based and dissolve after the compilation of the inventory, which creates difficulties in ensuring continuity in the processes. Furthermore, key institutions that generate or compile information and data related to GHG emissions and removals are not fully integrated into national monitoring and reporting processes. Lastly, there are challenges related to data access and data sharing, pointing to the need for the establishment of robust database management systems. This effort is also key to increasing transparency with respect to international reporting.

#### **Beneficiaries**

- National and provincial government agencies and units
- Technical partners and stakeholders (through increased data transparency)
- Other countries in the region (adoption of SOPs and south-south exchange)

Strong institutional arrangements provide the foundation for sustainable, operational MRV systems. SilvaCarbon aims to further strengthen institutional arrangements in the AFOLU sector by:

- Facilitating institutional need/gap assessments;
- Organizing targeted trainings/stakeholder consultations to address identified needs/gaps;
- Promoting south-south exchanges to learn from other countries' experiences and approaches;
- Developing standard operating procedures; and
- Strengthening data management and access (transparency).

These activities will be implemented within the frameworks of strengthening reporting to the UNFCCC as well as improving NFMS and MRV systems. This will include a focus on institutional arrangements for specific AFOLU sectors as well as MRV integration between local (community-based MRV), provincial/jurisdictional, and national levels.

Mentorship of specific institutions may also be warranted. For example, Cameroon's National Observatory of Climate Change (ONACC) has recently taken the lead on government efforts focused on climate change and related issues (e.g., NDC implementation under the UNFCCC, GHG inventory, UNFCCC communications) following the recent closure of the REDD+ Technical Secretariat. Given its new role, ONACC could greatly benefit from targeted mentoring and support in fulfilling its mandate.

### **Expected Milestones Under Outcome 1**

#### Output 1.1

- Submission of revised FRL/FREs with the inclusion of forest degradation in Cameroon and RoC.

#### Output 1.2

- Submission of national GHG inventory reports in Biennial Update Reports and National Communications that apply 2006 IPCC Guidelines and include improvements to help prepare for reporting under ETF in DRC and RoC. In addition, where applicable, assist countries with applying the 2013 Wetlands Supplement.

#### Output 1.3

- Development of region, country, and/or province-specific emission factors for AFOLU sectors in Ethiopia and Zambia.

### **Outcome 2**

➤ **Africa Strategic Priority 2.A: Enhance the communication of information and data for decision makers for more informed and better management decisions.**

SilvaCarbon will work with other technical partners in the region to establish better practices for communicating and distributing information and data produced through forest monitoring/MRV and GHG inventory efforts. Through effective communication to a wider range of targeted stakeholders, this information and data can inform management decisions and strategy and policy development processes, as well as facilitate increased transparency. Approaches to address this priority include, but are not limited to:

**Beneficiaries**

- National and provincial government agencies and units
- Technical partners, universities and stakeholders (through increased data transparency and availability)

- Facilitating information and data storage and distribution assessments to be able to identify and address needs/gaps;
- Mentoring government teams to establish robust frameworks for the analysis, application, and communication of information;
- Developing effective communication materials so stakeholders involved in sustainable forest management have greater access to relevant data and information;
- Organizing workshops and meetings with decision makers and key stakeholders to increase understanding of the available data and information and its utility for different policy requirements and decision making processes; and
- Participating in policy discussions and mentoring government partners for participation in such discussions.

➤ **Africa Strategic Priority 2.B: Support ISFL countries (Ethiopia and Zambia) in meeting the program requirements for achieving performance-based payments for AFOLU emissions reductions.**

The BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) is a multilateral fund supported by donor governments and managed by the World Bank. The fund promotes reducing GHG emissions from the land sector (deforestation, forest degradation, and agriculture) in developing countries at the subnational level as well as smarter land-use planning, policies, and practices. ISFL was designed to demonstrate how countries can move towards a full AFOLU approach to achieve emission reductions and receive performance-based payments for those efforts. ISFL has a geographically diverse portfolio of large-scale jurisdictional programs that can have significant impact and transform rural areas by protecting forests, restoring degraded lands, enhancing agricultural productivity, and improving livelihoods and local environments. In Africa, ISFL supports programs in Ethiopia and Zambia. The fund provides technical assistance to support the design of programs that impact multiple sectors of the economy and results-based payments to incentivize and sustain program activities. The SilvaCarbon program plays a technical backstopping role in supporting countries in meeting the specific [ISFL emission reduction requirements](#) and strengthening MRV systems at both regional and national levels.

**Beneficiaries**

- National and provincial government agencies and units
- Technical partners, universities and stakeholders (through increased data transparency and availability)
- Communities (indirectly through receiving results-based payments)

SilvaCarbon will continue to support and reinforce MRV systems for Ethiopia's Oromia Forest and Landscapes Program and Zambia's Integrated Forest Landscape Program in the Eastern Province. This work

will include strengthening capacities to collect national and jurisdiction-specific data for agricultural and forestry sectors (including livestock and forest degradation) to develop Tier 2 emission factors. Where appropriate, institutional arrangements may also be examined and improved for strengthened MRV systems by integrating jurisdictional and national levels. The overall aim is to enhance GHG emission reporting for AFOLU sectors to meet ISFL emission reduction reporting and results-based payment requirements. A focus will be placed on addressing specific gaps in the existing MRV frameworks prioritized by the highest emitting categories. Where possible, standard operating procedures will be developed, documented, and adopted by relevant government agencies. SilvaCarbon's support to the ISFL program will be defined by consultation and coordination with government and technical partners to ensure targeted, additional assistance.

## **Expected Milestones Under Outcome 2**

### Output 2.1

- Development of SOPs to support improved compliance in national reporting to the UNFCCC (NFMS, NFI, GHG inventory, etc.); improved data management and accessibility; and enhanced communication of information and data for decision making.

### Output 2.2

- Increased use of information and data by managers and policy makers, contributing to more evidence-based decision making and policy development.

## **Outcome 3**

- **Africa Strategic Priority 3: Build the pool of experts at national and provincial levels to support decentralized MRV and jurisdictional REDD+ programming with a specific focus on working with existing institutions and the promotion and development of women experts and technicians.**

A notable challenge in the region is the absence of a broader group of experts, and in particular, women experts. Ministry teams in the region are of limited size with varying levels of capacity and motivation and are predominantly comprised of men. Promising individuals who have been trained often leave government employment to work for NGOs or other international organizations requiring continual reinvestment in capacity development. We propose facilitating a wider training effort on terrestrial carbon accounting to reduce the impact of turnover by investing in a

broader pool of experts within the region with a specific focus on inclusion of women. Three key characteristics of these trainings are: 1) inclusion of universities and ministries; 2) inclusion and support of women; and 3) mentorship/professional internship/externships where possible.

### **Beneficiaries**

- Next generation of environmental leaders
- Students, University professors
- National and provincial government agencies and units
- National and regional technical-subject matter experts

This approach will focus at both national and sub-national levels, where possible, for example, focusing at the provincial level to train those in charge of overseeing the implementation and monitoring of jurisdictional REDD+ programs. A standardized training program will draw on regional experts as much as possible from Universities, Ministries and other local technical institutions to train up a new cadre of technical professionals. Such approaches also aim to further strengthen collaborations between academia and government.

The trainings will address a wide range of issues from more generic subjects related to GHG inventory, tracking indicators in NDC, establishing FREL, and REDD+ results-based accounting to more specific technical training courses related to Activity Data assessment (monitoring and measuring deforestation and forest degradation), Emission Factor estimation (analyzing NFI data), estimating uncertainties associated with GHG accounting, etc.

### **Expected Milestones Under Outcome 3**

#### Output 3.1

- Analysis and identification of the roles and responsibilities of different government agencies in communicating and collaborating on nested provincial and national MRV systems, including identification of gaps and recommendations for improvement.
- Expanded pool of experts, including women, at national and provincial levels to support decentralized MRV and jurisdictional REDD+ programming.

### **Strategy Development Process**

The SilvaCarbon FY20-25 strategy for Africa was developed through a series of consultations with a wide range of national representatives and international partners and was informed by SilvaCarbon's previous nine years of experience collaborating in Africa. Partners consulted include government officials, technical partners, NGOs, donors, UN Agencies, and SilvaCarbon experts. The strategy also draws on policy and strategy documents and recommendations coming out of past SilvaCarbon activities, for example the South-South exchange on MRV development organized in Brazzaville in October 2019. Country coordinators and in-country technical advisors have played a key role in the strategy development process. The country context and consultative processes for each of the SilvaCarbon Africa focal countries are described in more detail in Annex 1.

## Summary of Africa Country Engagement

Country	(B)ilateral / (R)egional Support	USAID Mission Buy-In	FCPF country	ISFL country	FREL submitted	Key Partners	Outcomes to be addressed (from Results Chain)		
							1	2	3
AFRICA									
Cameroon	B, R		Y			ONACC; MINFOF: SDIAF; ST REDD+; CARPE	Y	Y	Y
Central African Republic	R		Y			University of Bangui; MEDD; Ministry of Water and Forest			Y
Dem. Rep. of Congo	B, R		Y		Y	MEDD: DIAF; DDD; FONAREDD; FAO; UMD; CARPE; CRfN; UNIKIN; UNIKIS; ERIAFT; Uni of Lubumbashi	Y	Y	Y
Ethiopia	B, R		Y	Y	Y	EFCCC; OFLP; MoA; CSA; LFSDP; World Bank; Unique Forestry and Landuse	Y	Y	Y
Gabon	B, R		Y			AGEOS; Ministry of Water and Forests	Y		
Liberia	R		Y		Y	FDA; LFSP			Y
Madagascar	R		Y		Y	BN-CCCREDD+; Uni Antananarivo			Y
Rep. of Congo	B, R		Y		Y	CNIAF; MoE; FAO; CRfN; Marien Ngouabi University; REDD+ Coordination; CARPE; UMD	Y	Y	Y
Zambia	B, R			Y	Y	Forestry Department; ZEMA; Dept of Livestock; Dept of Agriculture; ZamStat; USAID; World Bank/BioCF	Y	Y	Y

## Asia Strategy

### Background

Despite a strong trend towards urbanization in Asia and the Pacific, forests continue to make significant contributions to people's welfare in the region. While forest area in the Asia-Pacific region has been steadily increasing, this is largely due to large-scale forest restoration and reforestation. Primary forest area continues to decline and forest degradation remains a serious problem.

At the same time, countries participating in the SilvaCarbon Asia Regional Program are moving from the REDD+ readiness phase to implementing REDD+ policies, actions, and result-based demonstration activities. As part of this transition, the mandate and responsibilities assigned to SilvaCarbon partner agencies has significantly broadened.

Access to reliable information plays an important role in accessing and implementing result-based payments and meeting reporting commitments. Currently, countries are working on updating their Nationally Determined Contribution and harmonizing the reporting from all Agriculture Forestry and Other Land Use (AFOLU) categories.

Land cover change monitoring is becoming increasingly important for tracking emissions reduction progress and monitoring the impact of policies and measures. This has prompted significant interest in topics related to the use of remote sensing in real-time monitoring and early warning, and forest restoration

monitoring. Efforts to mainstream and enhance national-level forest restoration efforts have particularly intensified within the framework of UNFCCC and Party's Nationally Determined Contributions under the Paris Agreement, and with the launch of global initiatives such as the Bonn Challenge and the Global Partnership on Forest Landscape Restoration (GPFLR), and regional efforts such as APEC 2020 Forest Cover Goal and the Regional Strategy and Action Plan for Forest and Landscape Restoration in Asia-Pacific.

In order to better use the large quantity of information collected through NFMS development, as well as other related initiatives, several countries have started working on consolidating different databases and improving access to environmental information.

Looking forward, SilvaCarbon Asia has the opportunity to continue collaborating with the different stakeholders, champion the work done in some of the countries in the area of land cover change monitoring, and expand assistance to meet emerging requirements.



*Figure 11: Forest cover in Khao Yai National Park, Thailand*

## Focal Countries

SilvaCarbon Asia Program will adopt a tiered approach to program delivery in South and Southeast Asia, as in the previous strategy period, and expand engagement in the Pacific region (Figure 12). This approach will entail:

- Engaging with the eight current SilvaCarbon countries in Asia through higher-level GFOI support and regional capacity building. These countries include:
  - **Bangladesh, Cambodia, Indonesia, Lao PDR, Nepal, the Philippines, Thailand, and Vietnam.**
- Providing targeted, country-level support to four focal countries, including:
  - **Cambodia, Indonesia (Jambi provincial level), Lao PDR, and Nepal.**
- Implementing a dedicated country-specific program for **Vietnam**.
- Seeking to expand engagement with countries in the Pacific region in order to dovetail with the anticipated Climate Fellow to be posted in **Fiji**.
  - Countries in the Pacific include the **Federated States of Micronesia, Kiribati, Marshall Island, Nauru, Palau, Samoa, and the Solomon Island.**
  - SilvaCarbon will also complement FCPF efforts in **Fiji, Papua New Guinea, and Vanuatu.**

## Support to Date

The Asia Regional Program was initiated in 2013 with an initial focus on convening thematic regional workshops to help countries identify data needs and gaps for monitoring forest and terrestrial carbon<sup>7</sup>. Through these workshops, countries were exposed to different methods and approaches and were able to discuss common challenges related to MRV for REDD+.

As the program established partnerships with different national agencies, projects, and development partners, the

focus shifted towards developing tailored trainings for selected countries in response to specific technical needs and challenges. Particular emphasis was placed on working under the umbrella of nationally led processes and in close collaboration with other initiatives and projects. This approach enabled the program to make important contributions to address technical gaps and priorities and helped to create a reputation as a practical capacity building program, despite the relatively limited funding available per country.

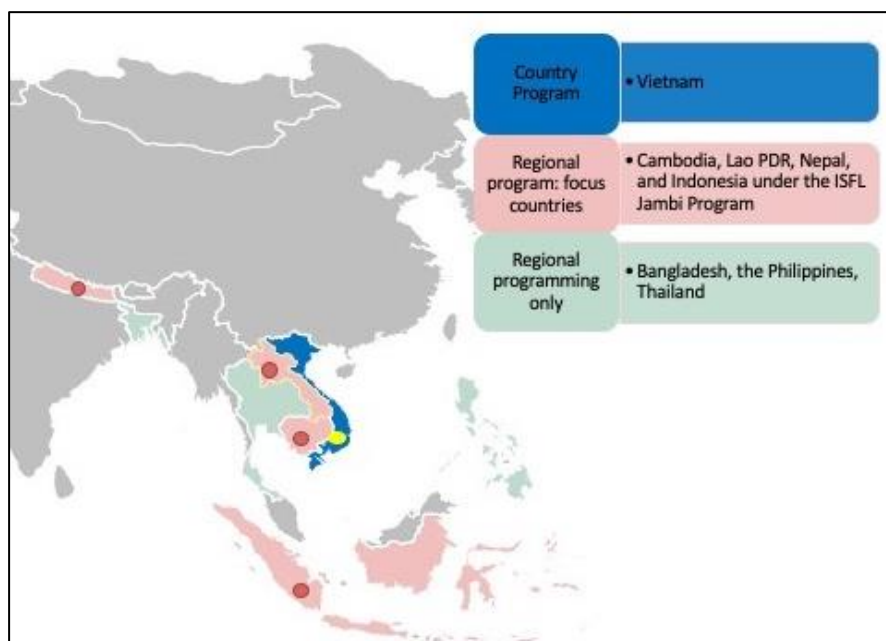


Figure 12: Current SilvaCarbon Programming in Asia (as of 2020)

<sup>7</sup> The series of workshops conducted from 2013-2015 include regional GFOI workshops, collaborative stock-taking workshops implemented with the UN-REDD program, and workshops implemented under the AFOLU working group umbrella.

Since 2016, the program has been implemented through a two-tiered approach that included: (1) targeted, country-level activities in several focal countries (Cambodia, Lao PDR, and Nepal), and (2) regional-level capacity building and South-South collaboration focused on common issues and challenges. The two-tiered approach has proven as a cost-effective way to ensure strong country presence, provide timely support to important national priorities, and contribute to broader initiatives such as the BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL).

From the start of SilvaCarbon involvement in Asia in 2013, a dedicated country-specific program was established for Vietnam in response to country requests for in-depth technical support. Since then, Vietnam has been recognized as a leader in REDD+ MRV in Asia. With the signing of the Emissions Reduction Payment Agreement with the World Bank at the end of 2020, Vietnam progressed from REDD+ readiness to implementation of REDD+ policies and measures. The Government of Vietnam is aware of the importance of transparent and accurate data for securing result-based payments and continues to be a strong partner of the SilvaCarbon program.

### Reflections on Program Progress to Date

- Significant improvement in technical capacity of main partner agencies. Since the start of the project, SilvaCarbon Asia has witnessed technical counterparts moving from being recipients of technical support to becoming co-developers, co-trainers, and co-authors of peer reviewed papers.
- Continued focus on addressing national priorities, resulting in direct contribution to important processes such as FREL development, improving current and future (ETF) reporting under the UNFCCC, NFI, etc.
- Trusted relationships built over several years working with the same teams contributed to increased understanding of how best to work together.
- Close partnerships with SERVIR Hubs and FAO and effective collaboration with FCPF, JICA, EC-JRC and other donors.

#### Box 5. Partner Success Stories - Asia

For details visit:

<https://sites.google.com/view/silvacarbon-asia/home>

- Technical support to Nepal resulting with improved forest cover maps required for accessing climate funding
- Long-term partnerships in Vietnam contribute to improved forest monitoring
- Donor collaboration in Lao PDR to tackle challenging issues with monitoring shifting cultivation and selective logging
- Focal counties are successfully integrating number of open source tools and platforms such as Google Earth Engine, SEPAL, Regional Land Cover Monitoring System cost-efficient land cover monitoring

### Milestones Achieved to Date

- All focal countries have improved their forest cover change mapping
- Lao PDR and Nepal Emissions Reduction Programs Approvals. SilvaCarbon supported forest cover change maps were used for developing the baseline for both countries
- First Biennial Update Report for Cambodia
- Helping Vietnam move from Tier 1 to Tier 2 reporting in the AFOLU sector
- Integrating QA/QC in Vietnam's NFI
- Supporting improvements of NFI in Bangladesh and Nepal
- Collaboration on harmonized Land Cover Classification in Nepal and improved land cover classification in Cambodia

## Vision for 2025

The Asia Program will work to achieve the following Vision for 2025, pursuant to the overarching impact from the SilvaCarbon Results Chain.

❖ **All participating countries in Asia should have national systems in place to efficiently track and monitor land-cover changes for a variety of purposes:**

- **Access sustainable forestry financing, including result-based payments**
- **Inform policy development and land use planning**
- **Foster research and knowledge exchange at national and regional levels**

## Strategic Priorities and Expected Milestones

To realize this Vision, the Asia Program will focus on the following Strategic Priorities and Expected Milestones during the FY20-25 period in accordance with the Outcomes and Outputs from the SilvaCarbon Results Chain.

### Outcome 1

- **Asia Strategic Priority 1: Support countries to access sustainable forest financing, including implementation of result-based payments initiatives.**

Countries participating in the SilvaCarbon Asia Regional Program have moved from the REDD+ readiness phase to implementing REDD+ policies and actions, and result-based demonstration activities. To date, Indonesia is the only country in this group that has received result-based payments for REDD+. Indonesia is also participating in the BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) implemented in the Jambi Province. Lao PDR has already approved GCF mitigation project, Nepal's cross-cutting projects focused on Churia region was recently approved, and Cambodia and Vietnam are discussing the submission of REDD+ result-based proposals.

#### **Box 6. Sustainability and Self-Reliance**

In its next phase SilvaCarbon will work with national counterparts to consolidate and institutionalize knowledge and products created in the previous years.

A focus will be to develop guidelines and protocols and provide opportunities for national counterparts to share their work in relevant scientific journals and global events. In addition to building confidence, documentation and sharing will lead to increased transparency of forestry and land cover data.

The program will also facilitate different TOT and mentorship approaches, which will be driven by the technical specialist in the region, with backstopping support from SilvaCarbon experts. This will include transfer of knowledge from central to sub-national level, as well as exchange among the countries.

Reliable and transparent information will play pivotal role in implementing result-based payments. SilvaCarbon partner agencies will require support to align national and jurisdictional MRV approaches, track land cover changes at the landscape level in a timely manner, and capture emissions from agriculture sectors and from different carbon pools. To address this need, SilvaCarbon will provide technical support

for improved crop mapping and land cover data harmonization and will expand ongoing NFI work to build capacity for developing Tier 3 models of forest growth, debris, and soil carbon.

Beyond carbon funding, there is a strong interest in the Mekong region to increase private sector investments in the forestry sector. For the SilvaCarbon program and its partners this is particularly relevant with regard to attracting sustainable investments for restoring degraded forests. SilvaCarbon will continue working with partners to develop and apply spatial tools that will inform the planning of forest restoration initiatives, and will decrease the cost of long-term monitoring of impacts.

### **Expected Milestones Under Outcome 1**

#### Output 1.1

- Consistent and improved National Determined Contributions.
- Biennial Update Reports and future reports under the ETF.
- Updated FRELs for national reporting under the UNFCCC and for accessing climate finance.

### **Outcome 2**

#### ➤ **Asia Strategic Priority 2: Strengthen AFOLU data management and sharing at the national level in support of policy formulation and sustainable land use planning.**

Standardizing access to environmental data has been identified as an important long-term objective across the Asia region. Discussions with SilvaCarbon partners point to the following challenges: (1) data is not in a shareable form (e.g. spread across several laptops or hard drives), (2) there is a lack of capacity and resources to produce periodic reports on the state of forests that are easy accessible to non-technical decision-makers or the general public, and (3) data collected from different projects have inconsistent quality and are thus difficult to compare and use for policy formulation at the national level.

Despite the significant increase in confidence of national data sets as a result of continuous capacity building and the use of open source tools and platforms, there are still major challenges with compiling, storing, and sharing forest and land cover data with multiple users. These challenges have been prioritized by several focal countries including Cambodia, Nepal, and Vietnam, which are already taking steps to improve data management. SilvaCarbon support will be geared towards improving the overall transparency and consistency of the forestry and land cover data and will include collaboration on topics such as ensuring QA/QC, protocol development, and database management. SilvaCarbon will also work with partner countries to develop reports and communication materials that will summarize findings from mapping and/or forest inventory work.

Improved management of AFOLU sector data is particularly relevant for the process of developing and implementing the Nationally Determined Contributions, and for supporting the effectiveness of future GHG Inventories and national reports, including reports under the ETF.

Another area of interest currently prioritized by countries in the Mekong region is to better use satellite data for detecting illegal logging activities and informing adequate responses. This requires development of a robust and transparent system for data analysis and data sharing. SilvaCarbon will work with countries in the Mekong region to support their efforts focused on real-time monitoring and forest alerts. As an initial activity, SilvaCarbon is planning a regional GFOI workshop to take stock of different needs and developments and share existing approaches that can be adapted to the Asia region.

## Expected Milestones Under Outcome 2

### Output 2.1

- Countries are demonstrating ability to meet the MRV requirements for accessing and implementing result-based payments.
- Improved access to other types of sustainable forest finance (including private sector investment).
- Forest Landscape Restoration Monitoring Plans at sub-national and national level.
- Consolidated forestry and environmental database.

### Output 2.2

- Improved NFI reporting.

## Outcome 3

- **Asia Strategic Priority 3: Increase South-South collaboration among government agencies, academia, and civil society to foster innovative research on forest and land-cover monitoring.**

During the past seven years SilvaCarbon has witnessed significant improvements in MRV capacity of national land use agencies. This is due to the continuous technical support and guidance available through donor support, dedicated technical teams, and supportive leadership.

In its next phase, SilvaCarbon aims to capitalize on the work done in the focal countries and engage in: (1) transferring knowledge at the regional level, (2) working with US and national researchers to publish peer-reviewed papers and contribute to the global scientific community, and (3) collaborating with civil society to improve the flow of information (e.g. crowd sourcing, projects and private sector involvement, etc.).

## Expected Milestones Under Outcome 3

### Output 3.1

- Increased evidence of South-South collaboration.
- Increased number of joint publications and research projects.

## Strategy Development Process

The initial discussions around the next phase of the SilvaCarbon support started towards the end of 2019, with a series of meeting with Government partners in Cambodia, Lao PDR, Nepal, and Vietnam. In addition, the following meetings were organized with different stakeholders and partners:

- Meetings with USAID Missions in Nepal and Lao PDR, and with RDMA to inform them about the Strategy Planning and to learn about ongoing and planned priorities for each Mission
- Meetings with other USAID funded projects in the Mekong region to discuss potentials for collaboration and exchange of information, including the Greening Prey Long Project, Cambodia, and Green Invest Asia  
Meetings and follow-up consultations with SERVIR-Mekong and SERVIR-HKH, as our main implementing partners for number of activities
- Meetings and follow-up consultations with FAO, JICA, GiZ, and EC-JRC, and GEF (CIBIT)

- Conference calls with ISFL Jambi Program to discuss specific inputs that SilvaCarbon can provide to the pre-investment grant
- Consultations with USFS Program Managers for Bangladesh, the Philippines and the Pacific region
- Consultations with key technical experts engaged in the program

Partner agencies continued to be consulted throughout the Strategy planning and were given a chance to review and provide inputs on the different drafts.

## Summary of Asia Country Engagement

Country	(B)ilateral / (R)egional Support	USAID Mission Buy-In	FCPF country	ISFL country	FREL submitted	Key Partners	Outcomes to be addressed (from Results Chain)		
ASIA									
Bangladesh	R				Y	SERVIR-HKH, COMPASS, Bangladesh Forest Department			Y
Cambodia	B, R		Y (ending in FY21)		Y	Ministry of Environment, Ministry of Agriculture Forestry and Fisheries, SERVIR-Mekong, FCPF, FAO, Royal University of Agriculture	Y	Y	Y
Fiji	R		Y		Y	Ministry of Forestry, GiZ, JICA	Y		Y
Indonesia	R		Y	Y	Y	Ministry of Environment and Forestry, ISFL Jambi, FAO	Y		Y
Lao PDR	B, R		Y		Y	Ministry of Agriculture and Forestry, National University of Laos, JICA, EC-JRC, GiZ, RECOFTC	Y	Y	Y
Nepal	B, R		Y		Y	Ministry of Forests and Environment, SERVIR-HKH	Y	Y	Y
Philippines	R					Forest Management Bureau, Central Mapping Agency		Y	Y
Thailand	R		Y			Ministry of Natural Resources and Environment, FAO			Y
Vietnam	B, R		Y		Y	Forest Inventory and Planning Institute, Ministry of Natural Resources and Environment, SERVIR- Mekong, Vietnam Forestry University	Y	Y	Y

## Latin America and Caribbean Strategy

### Background

SilvaCarbon advances REDD+ and other climate change mitigation and low-emission development initiatives in Latin America and the Caribbean (LAC) by supporting the design and implementation of robust and transparent national forest and landscape monitoring systems and terrestrial GHG inventories that can provide input to the UNFCCC and other international reporting frameworks. The program provides targeted technical assistance to improve the quantification of both above- and below-ground carbon based on the needs and priorities of partner countries in both Central and South America.



Figure 13: Measuring below-ground carbon in Mexico

Of the 18 Latin American countries participating in FCPF program, forest cover ranges from 4 percent (Uruguay) to more than 90 percent (Suriname) of the country's total surface area. However, forests represent from 35 to 60 percent of the total surface area for most countries in the region. Throughout the region, forests remain under pressure, to varying degrees, from conversion to agricultural lands, mining, and other economic activities. GHG emissions from forest loss generally represent a large percentage of overall emissions in LAC, and countries' respective emissions reduction strategies rely heavily on slowing forest loss through various means, as discussed in their NDCs. There are notable differences in forest trends at the sub-regional level. For example, countries in Central America tend to have higher rates of deforestation (>1 percent) than countries in South America (~0.5 percent), possibly due to differences in population density. The only country in the region to show forest cover gains recently is Costa Rica, though emissions from forest degradation remain a concern there.

Throughout the region, many international donors have established programs to assist governments in advancing the development of methods to measure and monitor forest emissions. REDD+ donors include USAID and DOS (via different programs including SilvaCarbon), Moore Foundation, GIZ, Norway, JICA, UN-REDD, and FAO, among others. While these various forms of support have assisted several countries in the region advance in the use of remote sensing products and the implementation of forest inventories, there is still a need for technical assistance in two key areas: (1) reporting, including UNFCCC reporting and reporting under results-based programs such as GCF and FCPF, and (2) most importantly, tracking progress toward mitigation, including mitigation activities outlined in country NDCs as well as any Nationally Appropriate Mitigation Actions (NAMAs) countries may implement in the forest sector.

A common challenge in the LAC region is the high turnover of in-country staff involved in REDD+. Because some of these positions were initially supported by international donors, they can be difficult for governments to absorb over the long term and can potentially cause delays or shift the focus of key efforts. SilvaCarbon will work to address the challenge of sustainability to enhance the countries' pathways towards permanent, robust monitoring and reporting systems.

### Focal Countries

SilvaCarbon FY20-25 partner countries in Central America include:

- **Mexico, Guatemala, Honduras, El Salvador, Costa Rica, Dominican Republic, and Panama.**

SilvaCarbon FY20-25 partner countries in South America include:

- **Colombia, Ecuador, Peru, and Paraguay.**

In addition, the SilvaCarbon LAC program may also collaborate with SERVIR in providing additional support to the following countries:

- **Brazil, Guyana, and Suriname.**

### Support to Date

SilvaCarbon seeks to build on the successes of its existing programs in the Andean Amazon and Central America regions by facilitating knowledge exchange, collaboration, and information sharing among countries throughout the LAC region on the theme of national-level forest carbon monitoring and MRV. The SilvaCarbon Andean Amazon program, established in 2011, has supported both regional and country-specific capacity-building activities primarily focused on Colombia, Ecuador, and Peru. The SilvaCarbon Central America program, established in 2014, has worked with eight countries on a regional basis and is currently focusing on country-specific engagement with Mexico, Honduras, Guatemala, El Salvador, Costa Rica, Panama, and the Dominican Republic. Additional collaboration has included work with Guyana, Suriname, and Brazil through regional collaboration with SERVIR. The shared language, depth of experiences, and ongoing communication and technical support across LAC contribute to excellent opportunities for South-South collaboration.

In 2017, SilvaCarbon finalized the work plans for the buy-ins with the USAID Missions in Colombia and Peru, along with the environmental ministries and agencies in the two countries. These buy-ins were the result of a successful five-year SilvaCarbon program in the Andean Amazon that provided ongoing capacity-building assistance for the development of their forest monitoring systems. Expected in 2020 are additional regional buy-ins to increase capacity building efforts in Ecuador and Paraguay.

SilvaCarbon also continues to provide support in the development and implementation of national forest inventories in El Salvador, Honduras and Ecuador. Honduras, through ongoing direct technical assistance from USFS inventory experts, has re-designed their inventory and are currently implementing their third cycle of measurement. They are also one of the first countries to fully adopt the use of digital data recorders for their inventory, greatly improving accuracy and efficiency in their monitoring system. Additionally, SilvaCarbon provided targeted trainings in the Dominican Republic on estimating emissions from wildfires, and to Honduras on measuring and reporting on degradation.

Specifically, SilvaCarbon-LAC provided targeted technical support to countries in South and Central America focused on:

- Improving estimates of GHG emissions and removals resulting from changes in land use, forest cover, and forest degradation, based on partner country needs and priorities, including REDD+ and international reporting.
- Enhancing NFIs to make them more statistically robust as required for MRV systems, and to integrate both national and regional information needs.
- Improving remotely sensed data for forest monitoring and creating national data and mapping products to be integrated in NFMS.

Colombia and Mexico are ISFL countries, and almost all SilvaCarbon-LACC countries are FCPF countries (Mexico has indicated their intention to step away from the partnership).

### Box 7. Partner Success Stories – LAC

#### South America

- Peru finalized its first forest change map and is completing the first phase of its NFI.
- Ecuador completed its NFI and first forest change map for an area typically covered by clouds.
- Colombia generated estimates of forest cover change annually for the first time and developed a NFI plan.
- Intensive carbon monitoring sites were installed in all three countries to increase understanding of forest-climate dynamics, build capacities for new carbon monitoring techniques, and provide research opportunities for scientists and students.

#### Central America

- SilvaCarbon regional exchanges helped specialists tackle key monitoring challenges such as NFI planning and design, forest attributes and sampling, allometric equations, statistical methods for generating biomass and carbon estimates, and integration of remote sensing and field data.
- SilvaCarbon exchanges have significantly strengthened the regional community of forest monitoring experts, contributing to inter-regional learning, networking, and self-reliance.
- Honduras re-designed the NFI and will now incorporate portable data recorders to capture forest data more accurately and efficiently.

## Vision for 2025

The LAC program will work to achieve the following Vision for 2025, pursuant to the overarching impact from the SilvaCarbon Results Chain. The Vision emphasizes capacity-building and direct, targeted technical assistance for countries across the REDD+ readiness spectrum.

#### ❖ **SilvaCarbon LAC countries will have:**

- **Linked forest MRV data to national GHG inventories;**
- **Strengthened capacities beyond basic forest monitoring;**
- **Enhanced capacities to report on forest degradation;**
- **Increased in-country capacities to improve FRELs; and**
- **Well-coordinated support from SilvaCarbon and the international donor community.**

**Linking forest MRV data to national GHG inventories.** Currently, the data produced by forest MRV systems are not yet fully linked to the national GHG inventory process. Furthermore, data produced are slow to be adopted by policymakers for use in estimating national references levels and REDD+ scenarios due to national capacity limitations, both technical and financial. Forestry-sector data produced under forest monitoring systems are still not used in BURs and National Communications to the UNFCCC, as these systems are based on 1996 IPCC guidelines that do not require the necessary level of detail in the AFOLU sector. Use of the IPCC 2006 Guidelines will be a requirement under the forthcoming ETF.

**Developing capacities beyond basic forest monitoring.** Countries in the region have advanced in the past years and have expressed an interest in receiving assistance in the areas of NFI implementation and land use mapping. Two key priorities for SilvaCarbon are (1) implementing NFI that are consistent and can be integrated with remote sensing products generated to estimate the change area, and (2) mapping other IPCC classes beyond forests consistently with a replicable methodology.

**Supporting Degradation Reporting.** SilvaCarbon will provide targeted support so that countries in LAC can begin to report on degradation, as well as put systems in place to track the last three REDD+ activities. This means moving beyond just forest gain/loss detection into producing estimates for areas of forest land remaining forest land (FLFL). A study from Mexico, with participation and support from SilvaCarbon scientists, shows that reporting only on forest gain/loss produces estimates that shows a country is a net emitter, while incorporating estimates from human-impacted FLFL shows that a country's forests may, in fact, be a strong sink. Countries in LAC currently have little data and limited technical capacity to produce these estimates.

**Building in-country capacity to improve FRELs.** SilvaCarbon will develop the capacity within partner governments to explore, through cost effective methods, future emissions scenarios. Much of the work done to generate reference levels in some LAC countries is the result of consultancies with private firms or international donors. There is a desire throughout the region to generate capacity within the government to meet current and future needs in-house, so as to be more responsive to the changing needs of government policymakers.

**Coordinating with other donors.** A key priority for the LAC regional strategy is to identify and coordinate the contributions of those programs involved in the region such as UN-REDD, SERVIR, FAO, World Bank, etc.

## Strategic Priorities and Expected Milestones

To realize this Vision, the LAC Program will focus on the following Strategic Priorities and Expected Milestones during the FY20-25 period in accordance with the Outcomes and Outputs from the SilvaCarbon Results Chain.

### Outcome 1

- **LAC Strategic Priority 1.A: Build capacity and provide guidance through the process of designing and implementing an NFI to provide accurate estimates of carbon stock and other forest resource data.**

Countries in South and Central America have recently begun to work with SilvaCarbon experts to re-design their inventories to make them more cost efficient and fulfill the carbon-oriented component needed for their MRV systems. Since 2008, Colombia has been relying on field data collected in different plots throughout the country, however plots are managed by different institutions and collected using different methods. Peru is in the process of finishing the first phase of its NFI with SilvaCarbon and FAO assistance. Ecuador requires assistance in merging its old NFI design with a new one capable of monitoring over time. Costa Rica, Guatemala, and Panama require assistance in merging their old NFI designs with new designs capable of monitoring over time.

- **LAC Strategic Priority 1.B: Build technical capacity to develop consistent products over time that are necessary for improving GHG inventories, FRELs, and NDCs in-country.**

GHG emissions inventories are conducted by governments to quantify the influence of anthropogenic activity on emissions and removals of several gases, including CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub>, which are of particular relevance to forestry and agriculture. Emissions occur due to activities related to energy use, industrial production, waste management, agricultural production, and land use and forestry management. Developing a GHG inventory that quantifies anthropogenic GHG emissions and removals at a national scale is a challenge for most countries. SilvaCarbon has been working with Colombia, Peru, and Ecuador since

2011 and with Central American countries since 2016 to develop the datasets necessary for a GHG inventory and manage the information.

### **Expected Milestones Under Outcome 1**

#### Output 1.1

- Strengthened country capacities for integrating REDD+ forest mapping estimates into GHG inventory reporting in line with the 2006 IPCC Guidelines.
- Increased understanding on how to define, measure, and classify degradation within their monitoring systems and incorporate emissions from degraded areas into their reporting.

#### Output 1.2

- Countries will have an NFI design or redesign in place, with at least one cycle completed.

#### Output 1.3

- Improved country capacities, including improved institutional arrangements, in developing and sustaining datasets necessary for GHG inventory preparation on biennial basis (at minimum).

### **Outcome 2**

- **LAC Strategic Priority 2.A: Build capacity in the use of remotely sensed data to create national products that will be integrated with a NFMS and allow land managers to make better informed decisions.**

LAC countries have been advancing in the production of forest change maps and the testing of different methodologies in collaboration with multiple donors. Colombia has been able to integrate different methodologies into one they called their own; the Institute of Hydrology, Meteorology, and Environmental Studies (IDEAM) has been able to establish a systematic process to detect forest cover change with support from SilvaCarbon, GIZ, the Brazilian National Institute For Space Research (INPE), and Moore Foundation. Peru, Paraguay, and Ecuador are using external methodologies adapted to local conditions. In Central American countries there is a strong need to establish a systematic process to detect forest cover change.

- **LAC Strategic Priority 2.B: Promote the development of standard operating procedures focusing on MRV processes and data management.**

MRV technical capacity has significantly increased among government agencies in LAC, but there is a need develop SOPs to document the improved workflows and promote sustainability and consistency over time. Most countries have developed documents that describe policy and design decisions (e.g. forest definitions, tiers, land use classification systems), but the existing documents do not provide sufficient practical information on the methodological approaches used (e.g. tools and data, step-by-step processes). The lack of adequate SOPs has made it difficult to replicate the work when technical officers change positions. SilvaCarbon began collaborating with Central American countries several years after South American countries, and although technical capacity in Central America has been developing rapidly, lessons learned from Andean Amazon partners are valuable for Central American counterparts. SilvaCarbon LAC will provide support to assist with the development of SOPs in both regions.

### **Expected Milestones Under Outcome 2**

#### Output 2.1

- Increased country capacities to integrate ground-based data from NFI or other sources with remote sensing change area estimators, as well as to generate consistent land cover products with systematic and replicable methods
- Increased use of forest monitoring data in land management decisions in countries, contributing to improved national climate change mitigation and development strategies.

#### Output 2.2

- Increased application of existing in-house technical capacity to produce data to influence policy, and increased use of existing baselines to support decision making processes.

### **Outcome 3**

#### ➤ **LAC Strategic Priority 3.A: Strengthen the community of forest and terrestrial carbon technical experts.**

Continued assistance is needed to support countries in developing their own research capacity. Countries in LAC have many research institutions and universities working to develop and test methodologies for forest carbon monitoring, but more work is needed to increase the capacity of these institutions to be able to provide input at a national level. SilvaCarbon has supported peer-to-peer collaboration and research capacity-building activities, including work with the intensive monitoring sites in Colombia, Peru, and Ecuador, and will continue these efforts in its next phase to increase research capacity and collaboration among research institutions.

### **Expected Milestones Under Outcome 3**

#### Output 3.1

- Improved coordination among international partners working in LAC as result of SilvaCarbon-LAC's prioritization approach, which tailors support to each country's circumstances and leverages other efforts in the region.
- Strengthened and expanded peer-to-peer, academic, and institutional relationships in the region to better provide country-specific support.

### **Strategy Development Process**

The development of this document was done with constant communication with partner agencies and academia in each country. Many international donors were also included in the design (FAO and World Bank in particular). In South America, USAID Missions were particularly involved in outlining priorities through the process of developing the buy-in documentation. The new SERVIR hub in Colombia and the Central Office in NASA play a key role in developing the strategy based on areas they can be supporting.

## Summary of LAC Country Engagement

Country	(B)ilateral / (R)egional Support	USAID Mission Buy-In	FCPF country	ISFL country	FREL submitted	Key Partners	Outcomes to be addressed (from Results Chain)		
							1	2	3
LATIN AMERICA AND THE CARIBBEAN									
Brazil	R				Y	SERVIR			
Colombia	B, R	Y	Y	Y	Y	Institute of Hydrology, Environmental Sciences, and Meteorology (IDEAM)	Y	Y	Y
Costa Rica	B, R		Y		Y	REDD+ Secretariat; CENIGA; National Forestry Financing Fund (FONAFIFO); National Meteorological Institute (IMN); National System of Conservation Areas (SINAC)	Y		Y
Dominican Republic	R		Y		Y	Ministerio de Medio Ambiente y Recursos Naturales (MARN)			Y
Ecuador	B, R	Y			Y	Ministry of the Environment (MAE)	Y	Y	Y
El Salvador	B, R		Y			Ministry of Natural Resources (MARN); Ministry of Agriculture (MAG)	Y	Y	
Guatemala	B, R		Y			Inter-institutional Mapping Group (GIMBUT)	Y	Y	Y
Guyana	R		Y		Y	SERVIR			
Honduras	B, R		Y		Y	Forestry Conservation Institute (ICF)	Y	Y	Y
Mexico	B, R		Y	Y	Y	Forest Service (CONAFOR)		Y	Y
Panama	B, R		Y		Y	MiAmbiente	Y		Y
Paraguay	B, R	Y	Y		Y	Forest Service (INFONA); Ministerio del Ambiente y Desarrollo Sostenible (MADES)	Y	Y	Y
Peru	B, R	Y	Y		Y	Forest Service (SERFOR); Ministerio del Ambiente (MINAM); Instituto de Investigaciones de la Amazonia Peruana (IIAP)	Y	Y	Y
Suriname	R		Y		Y	SERVIR			

## Global Program Strategy

### Background

The next five years represents a crucial period for forest conservation and sustainable forest management globally, as tropical forested countries and the international community have together laid the foundation for potentially great gains. Forest carbon monitoring will play an increasingly important role in realizing this potential. The SilvaCarbon Global program will bring to bear the diverse strengths of USG technical agencies, a broad network of international partners, and a collaborative, flexible approach to capacity-building that distinguishes SilvaCarbon from other programs.

The Global Program provides leadership and direction to SilvaCarbon regional teams, serves as a centralized secretariat for SilvaCarbon as a whole, and implements global-level capacity-building activities. Key functions of the Global Program include facilitating coordination and collaboration among USG and international partners; developing and disseminating technical tools, methods, and guidance; and supporting South-South exchange and learning across countries and regions.

In its next phase the Global Program will continue its core functions and work to address additional priority topics in collaboration with partners. Key partners expected to play a significant role include GFOI, the World Bank (FCPF and ISFL), FAO (UN-REDD), SERVIR, and the UNFCCC. Key international initiatives include the Trillion Trees Initiative, the Sustainable Development Goals, and updates to the UNFCCC reporting guidelines.

### Support to Date

Illustrative SilvaCarbon results supported by the Global Program include:

#### Improved Tools and Methods

- Collect Earth Online:** The Global Program supported the collaborative development of Collect Earth Online (CEO) and associated CEO training materials. CEO is a custom built, open-source, high resolution satellite image viewing and interpretation system developed in response to the expressed needs of SilvaCarbon country partners. CEO builds on the Collect Earth desktop application created by FAO and is now being widely used for a variety of forest monitoring applications around the world.
- Early Warning Systems:** Through partnership with WRI and its partners at Wageningen University, the Global Program supported the development of a radar-based early warning system for detecting forest loss using freely-available Sentinel-1 data. The system is now operational in Peru, will soon be implemented in Central Africa, and is currently being scaled to eventually cover the entire pantropical region. SilvaCarbon's early investment in the system helped mobilize an additional \$1.29 million in private sector funding from companies operating in Indonesia and Malaysia.
- Continuous Degradation Detection on the Google Earth Engine:** The Global Program worked with Boston University to develop a suite of open source tools and software applications that use statistically sound methodologies to assess the accuracy of maps and estimate areas of land cover and



Figure 14: CEO screenshot

land cover change, and provided hands-on training to partners in SilvaCarbon countries on how to use the tools. Google Earth Engine has also partnered in this initiative and is now helping to develop capacity to detect forest degradation using remote sensing and create land cover maps using the Continuous Change Detection and Classification (CCDC) algorithm.

- Decision Support: The Global Program has provided expertise and resources to support country-led decisions regarding the selection of forest monitoring tools and methods. This includes, for example, supporting a USFS expert to work with IDEAM in Colombia to assess the cost-effectiveness of using LiDAR data to enhance forest carbon estimates; supporting a comparison of different mapping methodologies used in Peru; and initiating development of an annotated menu of available tools.
- Applied Research: The Global Program implemented a grants program in 2014 that supported eleven applied research projects addressing key technical challenges identified by SilvaCarbon country partners. These projects resulted in numerous peer-reviewed publications which served to improve the scientific basis for forest monitoring and continue to inform the capacity-building work of SilvaCarbon and its partners. Research topics included methods for monitoring forest degradation, the interoperability of different remote sensing systems and sensors, and the integration of different carbon estimation methodologies.

#### *Enhanced Coordination and Collaboration*

- Increased USG Engagement Internationally: Support from the Global Program has enabled USG experts to contribute to and benefit from international scientific fora focused on key forest monitoring topics. This has included active participation by USFS experts in UNFCCC technical deliberations and in various international efforts on issues such as forest carbon uncertainty analysis and the integration of remote sensing and NFI data for carbon estimation.
- Strengthened Expert Community: The Global Program has played a significant role in developing and expanding the international network of experts, practitioners, and researchers in the field of forest and carbon monitoring, and has leveraged this network to provide capacity-building opportunities for SilvaCarbon country partners. This has included supporting the participation of SilvaCarbon experts and country partners at key global forums (e.g. AGU, ForestSat, NASA Carbon Monitoring Group, GFOC GOLD) and facilitating a variety of technical consultations, events, and meetings to share information and updates, build consensus on approaches, and exchange experiences (e.g. monthly SilvaCarbon Technical Team Meetings, 2017 Expert Consultation on Forest Landscape Restoration, USFS FIA Science Stakeholder Symposium).
- Increased GFOI Engagement: The Global Program has increased SilvaCarbon's role and engagement in GFOI to enhance international coordination for forest monitoring. SilvaCarbon representatives now serve on the Leads Group and as co-managers of the GFOI Data component and Capacity Building component, and the Global Program has co-led the organization of two GFOI Capacity Building Summits, assisted GFOI to develop approaches for using sample-based area estimation methods, and contributed to the development of the GFOI communication strategy.
- Improved Program Communications: The Global Program has worked to develop improved internal and external communication channels and products to facilitate the flow of information among program partners and stakeholders. These efforts have included development of an enhanced program reporting framework, a range of targeted information products (e.g. fact sheets, blog posts,

newsletters, presentations, summaries, impact reports, etc.), a redesigned website, an enhanced social media presence, and a system of regularly scheduled meetings and consultations with staff and partners.

### *Increased South-South Exchange*

- UMD GLAD Global Exchange: An international exchange was held at the USGS headquarters for SilvaCarbon country partners to share lessons and approaches for implementing the UMD GLAD forest cover mapping methodology. Representatives from Cameroon, Colombia, Peru, Guatemala, Nepal, and Vietnam participated, as well as UMD and other partners.
- Peru-Indonesia Exchange: A university professor from Peru that has been involved in SilvaCarbon joined in a 10-day masters-level training course on forest monitoring and MRV for REDD+ organized for the Indonesia Environment Ministry by GFOI in collaboration with the University of Melbourne in Australia. GFOI is planning to offer the course in other countries and regions and is discussing the possibility of implementing the course as part of master's program on Forestry Management at the National University of the Peruvian Amazon.
- USFS FIA Stakeholder Science Symposium: Eleven SilvaCarbon countries benefited from focused international exchange at the USFS FIA Stakeholder Science Stakeholder Symposium, a biennial event bringing together forest inventory experts to share and foster innovation related to forest inventory tools, methods, and technologies.
- AGU Global Exchange: Together with SERVIR, SilvaCarbon co-developed technical sessions at the AGU annual conference in 2019 (San Francisco) and 2020 (virtual). The sessions engaged SilvaCarbon-sponsored participants from different countries, providing a valuable mechanism to create networking opportunities, offer exposure to new science and technology, and build skills and experience in developing and presenting research to improve national forest monitoring efforts.
- GEO for GOOD: SilvaCarbon supported the participation of country partners in the annual GEO for GOOD summit, hosted by the Google Earth Outreach team, in 2018 (Ireland), 2019 (California), and 2020 (virtual). This summit is designed for mapping and technology specialists actively working on projects related to mapping, providing a valuable avenue to acquire new skills needed to improve and troubleshoot NFMS technical components.

## Global Context

In consultation with partners, in-country staff, and other program stakeholders, the Global Program has identified a number of key challenges and related opportunities that must be addressed at the global level in order to fully realize the potential for forest monitoring in tropical forested countries over the next five years. These include:

**Donor coordination.** Coordination among forest monitoring support providers has significantly improved in recent years, however the donor space has also become more crowded and the risk of competing, conflicting, or duplicative efforts persists. There remains a need for continuous coordination and communication among support providers and beneficiaries alike, as well as practical mechanisms to ensure the harmonization of capacity-building activities being conducted by different groups. GFOI will play an increasingly important role in improving donor coordination, and the Global Program can both contribute to and benefit from these efforts through increased engagement with GFOI.

**New technical tools and methods.** Continuous scientific and technical advancement is essential for strengthening forest monitoring globally. At the same time, the rapid proliferation and promotion of new tools and methods – many of which are untested, costly, or competing – creates an abundance of options that can overwhelm country teams seeking practical, cost-effective solutions. All tools come with inherent tradeoffs and not all tools are appropriate to all countries. The Global Program can address this issue by providing unbiased decision support to assist in the selection of country-appropriate tools and methods. This may include comparing the strengths and weaknesses of different tools and approaches, assessing their cost-effectiveness, and/or developing user-friendly guidance to inform tool selection and investment. The Global Program can also support the refinement of existing tools and methods based on country needs and in some cases develop new tools to address identified gaps.

**South-South technical exchange.** All tropical forested countries face similar technical challenges in the development of national forest and landscape monitoring systems, yet to date there has been relatively limited exchange among technical counterparts from different countries. There are tremendous opportunities to advance forest monitoring progress through focused South-South exchange. Based on past exchanges supported by the Global Program, developing countries can significantly benefit from sharing approaches, lessons learned, and challenges and opportunities with regional and international counterparts. South-South technical exchange also plays a key role in fostering self-reliance, as it provides opportunities for country teams to form new partnerships and serve as technical resources to one another with reduced reliance on donor support.

**Gender integration.** The Global Program has identified a significant gender imbalance among individuals receiving and providing SilvaCarbon support. In fiscal year 2019, women participated in 5,017 of 16,715 total person-hours of SilvaCarbon training provided by USFS and USGS combined. While there are no formal indicators to capture gender representation among support providers, anecdotal evidence suggests the majority of SilvaCarbon technical experts are men. SilvaCarbon is committed to addressing this imbalance across all its activities and will seek to diversify its pool of technical experts (USG and academic) and promote gender diversity within the partner country institutions with which it works. As part of this effort, the Global Program is developing a two-part gender initiative that will (1) identify the barriers and other factors that influence women’s engagement in the field of forest and carbon monitoring, and (2) provide targeted professional development, mentoring, and networking opportunities to selected women currently working or studying in this field.

**Support delivery methods.** The COVID-19 pandemic has necessitated a shift in the way international support is delivered, as health risks and travel restrictions limit opportunities for in-person interaction. SilvaCarbon is embracing the use of virtual tools and innovative approaches to overcome this challenge. For example, the Global Program is collaborating with university partners to implement a series of E-learning modules and developing “train-the-trainer” (TOT) protocols. The repository of E-learning materials will provide partners free-access to relevant and useful content focused on specific forest monitoring tasks and associated technical challenges, such as working with algorithms in GEE. The TOT protocols will equip technical officers located in the same country or region to train local institutions using country-specific materials. If successful, these approaches may be adopted more widely and could lead to a reduced carbon footprint and cost savings to be invested in other SilvaCarbon activities. SilvaCarbon recognizes the fundamental importance of in-person interaction, however, and will continue to provide in-person programming once it is safe to do so. In-person interaction is crucial for facilitating technology transfer across language barriers and in locations with limited internet availability.

**Tracking and communicating country progress.** SilvaCarbon countries have made considerable progress in forest monitoring, but the way in which their progress is tracked and communicated can be improved. Tracking and communicating country progress in a clear and systematic manner is important for informing future programming, facilitating coordination with other donor programs, and demonstrating the value of SilvaCarbon support. The Global Program will reassess its monitoring and evaluation and communication strategies and seek to develop a practical approach for systematically tracking and communicating country progress. This may entail exploring different approaches for different partners and stakeholders (e.g. USAID Missions, country partners, and USG partners).

## Vision for 2025

Based on identified challenges and opportunities, the Global Program will work to achieve the following Vision for 2025, pursuant to the overarching impact from the SilvaCarbon Results Chain.

- ❖ **Support provided by SilvaCarbon is well-coordinated and responds flexibly to the evolving needs of SilvaCarbon countries.**
- ❖ **Technical teams in SilvaCarbon countries are integrated in a global community of experts and practitioners they can draw on for further support.**
- ❖ **SilvaCarbon countries have increased access to appropriate tools and methods and practical technical guidance for transparent, cost-effective forest carbon monitoring that supports international reporting requirements and contributes to improved natural resource management.**
- ❖ **SilvaCarbon has increased the engagement of women in program activities and contributed to tangible progress toward gender equity in the field of forest carbon monitoring.**
- ❖ **SilvaCarbon countries can use information generated for REDD+ reporting to improve natural resource management and address other priorities, such as implementing strategies for reducing deforestation.**

In working toward the Vision for 2025, the Global Program's approach builds on successes and lessons learned over the past decade of SilvaCarbon support. The approach is designed to support the on-the-ground activities of the Regional Programs and strives to be responsive to the identified needs and priorities of SilvaCarbon partner countries. Key aspects of the approach include:

- **Collaborative.** The Global Program leverages SilvaCarbon's interagency structure to promote meaningful collaboration between US and international partners across government, academia, NGOs, and industry. The Global Program will continue this work by facilitating regular interaction and consultation with program partners, supporting the participation of US experts in key international fora, and developing and disseminating US science and technology to meet country needs. This collaboration benefits country partners by strengthening the technical basis for forest monitoring, and it benefits the United States by expanding its international influence and bringing home new approaches and insights.

- **Practical.** The Global Program will work with regional programs and partners to provide practical, cost-effective solutions to real-world challenges encountered by technical teams in their daily work. This will be complemented by decision support, such as neutral expertise and/or user-friendly guidance materials, to aid in country-led decision-making processes regarding the selection of appropriate tools and methods.
- **Innovative.** The Global Program will also work with international academic and technical partners to foster forest and carbon monitoring innovation, and to help translate cutting-edge technologies to the developing country context. Investment in innovation advances the scientific basis for forest monitoring and creates more powerful tools that can be adopted by countries over time as their capabilities increase.
- **Supportive.** The Global Program will support regional programs in their on-the-ground work with country partners by identifying subject matter experts and technical resources; establishing connections with other programs and potential partners; supporting networking opportunities and cross-regional exchange; introducing tools and technologies; providing program management tools and resources, and facilitating core program functions such as reporting, work planning, and communications.
- **Flexible.** The Global Program will strive to maintain a high level of programmatic flexibility. SilvaCarbon's demonstrated ability to respond to changing circumstances allows it to effectively target and address the evolving needs and capacity of country partners (e.g. updated reporting requirements, shifting institutional arrangements, emerging national priorities, etc.).

## Strategic Priorities and Expected Milestones

To realize the Vision for 2025, the Global Program will focus on the following Strategic Priorities and Expected Milestones during the FY20-25 period in accordance with the Outcomes and Outputs from the SilvaCarbon Results Chain.

Global Milestones differ from regional Milestones due to the nature of global-level work, which focuses on supporting regional teams in achieving country- and region-specific milestones. The Global Program works to identify challenges and opportunities across regions and to develop responsive approaches that are implemented at a regional or country level. Global Milestones are thus broader and may be more qualitative than regional Milestones.

### Outcome 1

- **Global Program Strategic Priority 1: Develop, refine, and disseminate forest monitoring tools and guidance.**

The Global Program will work with Regional Programs and technical experts to identify opportunities to develop, refine, and disseminate forest monitoring tools and guidance to better support the needs of SilvaCarbon countries. SilvaCarbon tools will be demand-driven and practical to ensure successful uptake and support self-reliance. SilvaCarbon will remain agnostic regarding tool selection, recognizing that all tools have benefits and drawbacks and must be selected based on a thorough understanding of the country context in which they will be used. The Global Program will work to make information about tools readily available and will present the information in a clear, unbiased way to help countries determine their own path. Emphasis will continue to be placed on free and open-source tools and methods and cost-

effective approaches commensurate with the human and financial resources available in partner countries. Key topics to consider for potential tools and guidance include:

- Transparency
- Monitoring and communicating country progress
- Virtual tools, platforms, and protocols for delivering training and technical assistance
- Institutional arrangements
- Integration of optical data and radar data
- Satellite-based emission factors and integration with activity data
- Area accuracy assessment
- FRELs
- Application of forest monitoring data for resource management
- Self-monitoring for the private forestry sector
- Data management and sharing
- Training of Trainers
- Detecting illegal logging and informing appropriate responses
- National GHG reporting requirements (e.g. ETF, REDD+, etc.) and good practices

#### Box 8. Tools for Monitoring Country Progress

SilvaCarbon will develop a practical approach for systematically tracking and communicating country progress in measuring, monitoring, and reporting forest and terrestrial carbon.

The Global Program will seek regular feedback from USAID, DOS, regional programs, technical experts, GFOI, in-country partners, and others to identify and discuss relevant considerations for potential new tools and will collaborate with other partners on tool development.

#### ➤ **Global Program Strategic Priority 1.B: Support the integration of forest monitoring data in strategies for reducing forest loss.**

The Global Program will help further incorporate the data developed through forest monitoring systems into strategies for reducing forest loss. Previous support has emphasized assisting countries to meet their needs for monitoring and reporting deforestation and forest degradation, and as countries have progressed new opportunities are emerging for SilvaCarbon to assist with the incorporation of forest monitoring data in practical strategies for curbing forest loss. Global-level work in this area may include linking data created for a monitoring system into restoration efforts, Trillion Trees campaigns, transferring capacity on best practices for reforestation, and supporting forest health sustainability efforts. By using baseline data, SilvaCarbon can help partners map where forest loss is occurring and identify priority areas for restoration and reforestation.

#### **Expected Milestones Under Outcome 1**

##### Output 1.1

- Increased use of previously-generated NFMS data on deforestation and forest degradation to support planning and decision-making related to reforestation and restoration activities.
- Increased access to SOPs that document step-by-step methodologies used to monitor forest change.

##### Output 1.2

- Increased availability and quality of demand-driven tools and guidance to promote transparency and self-reliance with respect to national forest monitoring and MRV; increased international collaboration the development and dissemination of tools and guidance; increased access to unbiased decision support for tool selection and investment; increased innovation on forest monitoring tools and methods through partnerships with academic, government, and private companies.

## **Outcome 2**

### **➤ Global Program Strategic Priority 2: Identify and address new applications for forest monitoring data.**

The Global Program will work with country partners and SilvaCarbon regional programs to increase the utility and adoption of forest monitoring information in other sectors. Information and data generated through SilvaCarbon-related efforts has significant value beyond carbon reporting and can directly inform country-led decisions related to public health, livelihoods, and other aspects of natural resource management. The Global Program will work with partners to incorporate other consequences of deforestation and land use change. Work in this area will respond to country needs and will be coordinated with partners. Examples of potential collaboration include:

- *Impact of Fires on Livelihoods in Paraguay:* Collaboration with SERVIR-Amazonia, Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), AMERIGEOS, and Global Forest Watch
- *Biodiversity Loss to Small Scale Mining in Peru:* Collaboration with SERVIR Amazonia and Peru's National Agrarian University, building on previous community-based monitoring and early warning system work in Peru through SilvaCarbon.
- *Impacts of Deforestation on Ecosystem Balance in South America:* Collaboration with SERVIR-Amazonia focusing on the spread of mosquito-borne disease.

Possibilities for additional applications of forest monitoring information will be further developed with regional partners in Asia-Pacific and Africa and may include reforestation planning, management, and monitoring, and the impact of deforestation on flooding and droughts.

### **Expected Milestones Under Outcome 2**

#### **Output 2.1**

- Increased sharing of data and records among different institutions in countries, using common access platforms provided by the country or outside repositories such as the WB MRV Time or SERVIR platforms.

#### **Output 2.2**

- Increased, open dialogue between stakeholders with decision making power and stakeholders who produce technical reports and official data.

## **Outcome 3**

### **➤ Global Program Strategic Priority 3.A: Support opportunities for South-South exchange.**

The experience of SilvaCarbon countries working with other developing countries on shared forest monitoring challenges has significantly enhanced their capacities and provided valuable opportunities to strengthen their knowledge and skills with reduced donor support. Recognizing this, the Global Program will increase its efforts to identify and facilitate opportunities for productive South-South technical exchange among SilvaCarbon countries. Examples of potential support for South-South exchange includes establishing regional centers of excellence for forest monitoring, organizing international study tours focused on common technical challenges, coordinating global meetings and consultations on topics of mutual interest, and fostering networking and collaboration by supporting country participation in key events. This approach increases self-reliance among SilvaCarbon countries and strengthens the global community of forest monitoring experts and practitioners.

➤ **Global Program Strategic Priority 3.B: Implement effective coordination and communication.**

Through effective coordination and communication SilvaCarbon helps avoid duplicated efforts, increases cost-effectiveness, and achieves a greater impact. The Global Program will actively seek out new opportunities for meaningful coordination with other partners during the FY20-25 period. Engagement with GFOI and GFOI partners was emphasized in the previous strategy and will remain a priority in the FY20-25 strategy, with a broadened focus to include other additional partners.

- **USG:** SilvaCarbon's interagency structure allows the program to draw on the expertise of multiple USG agencies to provide integrated programming tailored to country needs. The Global Program will build on this asset in its next phase by pursuing deeper engagement with other USG partners. The Global Program also serves as a centralized secretariat for SilvaCarbon and is responsible for oversight of the work done by USG program managers and technical specialists at country and regional levels. Global Program objectives in this area include:
  - **USAID Mission Engagement:** Work with USAID Missions and US Embassies in SilvaCarbon countries to explore opportunities for joint implementation of activities.
  - **Work Planning:** Provide guidance and recommendations on the design and implementation of work plans and program activities to ensure appropriate consideration of cross-cutting themes and topics and raised by partners and stakeholders at the global level. Topics may include, for example, data transparency, gender integration, supporting access to sustainable financing, strengthening institutional arrangements for MRV, e-Learning approaches, and tracking and communicating country progress.
  - **Program Management and Monitoring:** Develop and share tools and strategies for improved program management and monitoring. A key objective is to implement a practical, globally-applicable tool for assessing country needs and tracking progress in NFMS and MRV development. Other examples may include development or refinement of the SilvaCarbon Results Chain, performance monitoring plan, or reporting templates.
  - **Improved Communications:** Provide guidance and support to ensure effective program communication both internally and externally, and work with regional teams and program partners to develop and disseminate targeted communications strategies, tools, approaches, and products for different audiences.

- **GFOI:** GFOI seeks to provide strategic assistance to developing countries working to establish NFMS and MRV systems for REDD+. SilvaCarbon represents the primary USG contribution to GFOI and has maintained a strong partnership with GFOI since its inception. Work with GFOI will include:
  - MGD and REDDcompass Support: Continue to work with GFOI and other partners to (1) increase awareness and uptake of the Methods and Guidance Document (MGD), complementary REDDcompass platform, and potentially other GFOI tools; (2) further incorporate the MDG and REDDcompass in SilvaCarbon capacity-building activities; and (3) provide expert input and facilitate country feedback to strengthen and refine the tools. The Global Program collaborated with GFOI to develop the MGD and REDDcompass, which together serve as a practical basis for capacity development in MRV for REDD+.
  - Component Management: Contribute to shared goals with GFOI as component leads for the GFOI Data Management component and the GFOI Capacity Building component. In the Data Management component, SilvaCarbon experts will collaborate to improve the integration of ground data with remotely sensed data and advise space and data agencies on the data needs and requirements of SilvaCarbon countries to improve data acquisition and distribution. SilvaCarbon's contribution to the Capacity Building component will be reflected in its ongoing capacity building work with country partners, one of SilvaCarbon's primary objectives.
  - Technical Expertise: The Global Program will provide SilvaCarbon technical expertise to build consensus forest monitoring approaches and advance ongoing work in key technical areas such as area estimation and uncertainty analysis.
  - Engagement with Leads: The Global Program will seek to strengthen global coordination and collaboration through engagement with GFOI, and will specifically work with GFOI Leads to support country-led efforts related to: data transparency and consistency; data sharing; data application for more informed decision-making and improved resource management; and development of sustainable financing opportunities for avoiding deforestation and degradation.
- **World Bank:** The BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) is a World Bank-led initiative that supports programs in Colombia, Ethiopia, Indonesia, Mexico, and Zambia to reduce GHG emissions from the land sector, including agriculture. The Forest Carbon Partnership Facility (FCPF) is a larger, complementary World Bank initiative currently supporting 47 countries to reduce GHG emissions from the forestry sector. SilvaCarbon recently began working with the World Bank to assist countries in meeting ISFL objectives and has previously worked with the World Bank to advance FCPF objectives. The Global Program will continue engaging in ISFL and FCPF efforts by providing targeted technical support and coordinating activities with relevant partners. This work will focus on assisting ISFL and FCPF countries to develop and implement national monitoring systems that produce transparent, reliable data to access results-based payments through the respective programs. The Global Program will facilitate collaboration at the global level and work with regional programs to coordinate partner input at national and regional levels.
- **SERVIR:** SilvaCarbon maintains a close partnership with SERVIR at both global and regional levels. The Global Program will seek opportunities to work together with SERVIR on key tools and methods, such as building on previous collaboration in the development of Collect Earth Online and the Synthetic

Aperture Radar (SAR) Toolbox. SERVIR will also continue to serve on the SilvaCarbon Steering Committee.

- **Academia:** US academia has been one of SilvaCarbon’s primary partners in the delivery of technical capacity-building support since 2011. SilvaCarbon is tasked with providing tropical forested countries with scientific and technical innovations in the use of data to monitor forest changes across time. Partnering with academic institutions allows the program to access science-based tools and applications and cutting edge technologies. Through the Global Program, SilvaCarbon has partnered with University of Maryland, Boston University, Wageningen University, Syracuse University, Oregon State University and others to achieve results in 25 countries. The Global Program will continue this collaboration in its next phase and work to identify new opportunities to increase impact together with country partners.
- **Google:** SilvaCarbon has partnered with Google Earth Engine (GEE) since 2017. GEE is an open-source platform that allows for the manipulation and analysis of satellite images and geospatial datasets for a variety of forest and landscape monitoring applications. Developing country partners with limited capacity to store large amounts of satellite data on dedicated hardware servers benefit from GEE’s cloud-based approach to data storage, but need specialized training to perform analyses and create satellite-based products. SilvaCarbon, GEE, and SilvaCarbon country partners have established a mutually beneficial public-private partnership that allows countries to take advantage of GEE’s advanced functionality while reducing program costs associated with training. A technical team from GEE provides targeted on-site training to SilvaCarbon country partners working with GEE, and in turn SilvaCarbon provides GEE with the key points of contact in countries that use GEE to create national products. To date, GEE and SilvaCarbon have delivered twelve week-long trainings in Central African and Latin American countries.

➤ **Global Program Strategic Priority 3.C: Address gender integration**

SilvaCarbon is committed to increasing women’s engagement across all program activities and seeks to improve gender integration in the broader field of forest and carbon monitoring. As a first step, the Global Program will pilot a gender integration activity, the SilvaCarbon Women in Forest Carbon Initiative. The initiative consists of two complementary components led by the USFS and USGS, respectively:

- **Research Study:** USGS will implement a research project to identify barriers and other factors that influence women’s engagement in the field of forest and carbon monitoring. The study will be oriented to inform future programming by SilvaCarbon and its partners.
- **Mentorship Program:** USFS will implement an international mentorship program to increase the level of engagement, experience, and credibility of women in the field of forest and carbon monitoring. The program will provide women with targeted professional development opportunities and establish an informal network of early- to mid-career women engaged in SilvaCarbon and SilvaCarbon-related work and study.

**Expected Milestones Under Outcome 3**

Output 3.1

- Improved coordination of global-level forest monitoring capacity-building activities (support is flexible, responsive, and complementary to other donor support); increased interaction and

collaboration with other USG agencies and international partners under GEO and GFOI; increased leveraged and/or mobilized funding by third parties; and responsible stewardship of US taxpayer dollars and government resources.

- Increased international engagement among technical specialists in SilvaCarbon countries, including ongoing exchange of knowledge and experiences between SilvaCarbon countries; reduced reliance on USG assistance for forest monitoring support.
- Increased and more meaningful engagement of women in SilvaCarbon capacity-building efforts; increased understanding of the drivers of gender disparity in SilvaCarbon countries; development of programmatic approaches to address gender disparities.
- Increased opportunities for feedback and input from SilvaCarbon country partners (decision makers and technical/scientific stakeholders) in GFOI initiatives, including GFOI Research and Development and Capacity Building priorities.

## Annex 1: SilvaCarbon Country Context

### Africa Focal Countries

#### Cameroon

Cameroon is situated in the heart of the Congo Basin with a high diversity of agroecological zones and approximately 19 million ha of remaining forest<sup>8</sup>. The forestry and agricultural sectors are high priorities for the Cameroon government as they generate more than 69% of GHG emissions through deforestation and forest degradation. To address these issues, Cameroon joined the Forest Carbon Partnership Facility (FCPF) in 2005 and submitted its Readiness Preparation Proposal in January 2013. In 2015, Cameroon has prioritized sustainable development in the AFOLU sector, energy security and poverty reduction in its new Climate Action Plan to the UNFCCC and its vision for long-term development<sup>9</sup>. At the same time, a commitment of reducing GHG emissions by 32% was formally made by the Cameroon government as a contribution to the international efforts to contribute to climate change mitigation. These efforts and commitments require the improvement of technical capacity and skills as well as the establishment of a series of instruments such as the NFMS and REDD+ institutional arrangements.

Since 2015, SilvaCarbon has been providing technical assistance to the REDD+ Technical Secretariat (ST REDD+)<sup>10</sup> and other key members of the MRV framework to address capacity building issues in the design and implementation of a NFMS. With the delivery of the National Strategy in 2018 and the Readiness package in March 2019, ST REDD+ was dissolved. Following the presidential decree of October 2019, the National Observatory of Climate Change (ONACC), which is an operational institution under the technical supervision of the Ministry in charge of Environment (MINEPDED), has taken the lead on conducting all activities related climate monitoring and climate change impact assessment including: monitoring and evaluation of GHG; co-benefits and communication; and cooperation and partnership.

Despite the cancellation of FCPF funds, the country is finalizing discussions with the Central Africa Forest Initiative (CAFI), FAO, and other partners to submit its Third National Communication, and update its first Biennial Report (BUR) in 2021, finalize the FREL, and launch jurisdictional REDD+ initiatives in the East and the Center Regions, with the support the German Development Bank (KfW) and the Japanese International Cooperation Agency (JICA).

#### Cameroon Strategy Consultation

The strategic priorities are in line with the Cameroon self needs assessment conducted in March 2019 and submitted to FCPF together with the REDD+ Strategy and other technical reports included in the Readiness package. The reports clearly identify areas to address the policy and legal gaps and barriers to reducing deforestation and forest degradation and enhancing carbon stocks. Partners involved in the REDD+ and climate change network (World Bank, FAO, GIZ, CIFOR, JICA, Transparency International, Rainforest Alliance) were consulted during this process. The SilvaCarbon program is responding to these identified needs in collaboration with other technical partners. Additional consultations were facilitated with key governmental

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<sup>8</sup> FAO. 2016. State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities. FAO, Rome available at <http://www.fao.org/3/a-i5588e.pdf>.

<sup>9</sup> MINEPAT, 2005: Cameroon's vision 2035. A roadmap for Cameroon's economic take-off: A work document. 65pp.

<sup>10</sup> ST REDD+ was the technical operational body of the government multisectoral steering committee which was in charge of conducting the FCPF Readiness phase and design the Country REDD+ Strategy.

institutions such as ONACC in the Ministry of Environment and Sustainable Development, the Department of Forest Inventory and Management (SDIAF) in the Ministry of Forest and Wildlife, the Department of Land Use Management and Zoning in the Ministry of Planning and the University of Yaoundé to ensure that the proposed SilvaCarbon strategy is in line with the REDD+ process and the country priorities and international commitments.

## Democratic Republic of the Congo

The Democratic Republic of the Congo (DRC) hosts 60% of the Congo Basin forest while being one of the world's least developed countries. Drivers of deforestation include shifting agriculture practices, woodfuel production, artisanal logging and mining, among others. Recognizing the significance of its vast forests, the DRC was one of the first countries to sign onto the REDD+ process in 2009. Since then it has advanced with meeting several key milestones outlined below:

- 2000: National Communications 1 submission
- 2008: USFS Technical Advisor embedded in DRC Government
- 2009: Launched REDD+ process
- 2009: National Communications 2 submission
- 2011: Establishment of NFMS
- 2012: [National REDD+ Framework Strategy](#)
- 2012: REDD+ National Fund established ([FONAREDD](#))
- 2015: [National REDD+ Investment Plan 2015-2020](#)
- 2015: Moved from readiness to investment phase
- 2015: National Communications 3 submission
- 2017-2020: Central Africa Forest Initiative NFMS program
- 2018: FREL submission

In DRC, SilvaCarbon has been providing technical assistance to the DRC's Ministry of Environment and Sustainable Development (MEDD) primarily focused on forest inventory and monitoring since 2011, following the placement of in-country staff in the Department of Forest Inventory and Zoning (DIAF) in 2008. This assistance has included a range of different activities, such as contributing expertise as a member of the forest inventory technical working group initiated in 2013, developing a pre-inventory soil sampling methodology, conducting field trainings on soil sampling techniques, assessing the capacity of national and university soil laboratories to process soil samples, and organizing field trainings on identification and inventory methods for bamboo and raffia species. SilvaCarbon has also supported national REDD+ efforts in DRC by working closely with the REDD+ National Coordination (CNREDD) office to assess the state of in-country and regional knowledge related to allometric equations, which are used to help calculate tree biomass and estimate carbon storage.

In 2016, the government of the DRC partnered with the [Central Africa Forest Initiative](#) (CAFI) to launch a four-year, \$200 million-dollar program to help countries protect and preserve their forests. Under the umbrella of this initiative, the DRC aims to strengthen and operationalize the NFMS. From FY17-FY19, SilvaCarbon has supported the NFMS stream led by the Food and Agriculture Organization of the United Nations (FAO) and implemented with MEDD's Department of Sustainable Development (DDD) and DIAF. Both DIAF and DDD play critical roles in the establishment of the NFMS. DDD leads inter-ministerial coordination efforts and manages the GHG inventory. In addition, DDD is responsible for meeting international reporting requirements such as the UNFCCC and Bonn Challenge. SilvaCarbon serves as a member of the NFMS technical working group and has provided technical input to the NFI methodology. SilvaCarbon has also organized trainings for DIAF focused

on forest inventory field methods for peatland forests, forest cover change analysis including estimating forest degradation and statistical analysis of NFI data.

Given the success of the NFMS program, CAFI is planning to launch a second phase to start in FY21. FONAREDD, the steering committee of the National REDD+ fund, has already requested continued SilvaCarbon support in the second phase of the program acknowledging the value of the technical assistance provided in the first phase. Additionally, there has been a need recognized to better integrate provincial-level REDD+ programs with national MRV efforts. Capacity development of additional experts in the region could help safeguard the NFMS at the national level against the draining of trained people to other organizations as well as provide part of the basis for establishing expertise at the provincial level to facilitate MRV activities for the provincial REDD programs. Currently capacity at the provincial levels are low to non-existent where capacity at the national level varies across and between teams. Low and varying capacities along with high turnover of competent staff and limited government resources are major challenges in the DRC. SilvaCarbon plans to further draw upon existing experts found within Universities and elsewhere as part of its strategy to address this capacity gap.

### *DRC Strategy Consultation*

Several partners who are members of the NFMS technical group were consulted including key government partners such as DIAF and DDD as well as FAO, FONAREDD, Norway/CAFI and University of Maryland (UMD). Technical experts and U.S. Forest Service SilvaCarbon detailers who have been engaged with programming in Central Africa were also consulted to help identify programming priorities. In addition, this strategy considers large investments by CAFI who, as previously described, plans to launch a second phase of NFMS in 2021.

### *Gabon*

More than 80% of Gabon is covered in forest hosting unique and endemic species including forest elephants and western lowland gorillas. Currently there is strong political support for conservation and sustainable forest management within the country. From 2011-2016 the Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) program provided support to the Gabonese government through the SilvaCarbon program to enhance the country's capacity to monitor and manage forest and terrestrial carbon. This program supported the government to: design and establish a nationwide carbon inventory; train Gabonese field teams in the collection of forest and soil measurements; assist in the analysis of field data to quantify forest biomass and carbon stocks; and initiate the development of a forest carbon calculator. Since the closure of the EC-LEDS program, continued SilvaCarbon support has included USGS training support to the Agence Gabonaise d'Etudes et d'Observations Spaciales (AGEOS).

In 2011, the Government of Gabon started a process for quantifying biomass and forest carbon combining field data and remote sensing data. Using satellite information in Gabon at that time was challenging due to the lack of time series optical data, and radar data. The government of Gabon relied on the technical support of the SilvaCarbon Program, the University of California in Los Angeles, Duke University, and Leeds University.

By 2013 they had collected 104 plots and the analysis showed an average carbon stocks of 136.9 Mg / ha across the country. An additional network of 400 to 600 plots was developed that included biomass in National Parks, where carbon stocks are higher. AGEOS was tasked with combining these plot data with remote sensing data estimates to create national carbon accounting estimations. AGEOS has been able to map forest cover in Gabon for 2015 to show a net deforestation rate of about 0.05 per cent per year between 2010 and 2015. As part of this work, the SilvaCarbon program supported AGEOS develop a semi-automatic methodology to analyze satellite images, including overlapping Landsat images to remove cloud cover, and annually update

maps and statistics on forest-cover change. Additional work with WRI and the University of Maryland could be combined with field data to produce reliable forest statistics at the national level. Their methodology makes it possible to produce a map of forest cover at five-year intervals. USGS, through SilvaCarbon, since 2015 has been providing technical support to AGEOS to improve these 5 years processes by introducing techniques for combining sensors and training on open source platforms.

AGEOS analyses show that Gabon have relatively low rates of deforestation, and the predominant REDD+ activity is forest degradation. The deforestation rates are low due to their strong forest governance. However, in Gabon the drivers of deforestation and degradation are not well known, but the visible deforestation appears to be caused by development of agricultural activities and population settlements, and development of mining activities and infrastructure, while illegal logging for timber is the main cause of degradation. Our vision for the next five years is to assist AGEOS to evaluate the significance of these drivers when they rely on accurate data, and to help them to strategize the involvement of the communities in monitoring land use changes. In addition, AGEOS has strong technical capacity in place and can be a leader in capacity transfer in the region. Key areas on the strategy will include:

- Strengthen the technical capacity to use earth observations to monitor forest disturbance and include monitoring degradation into the operational NFMS and MRV.
- Facilitate the transfer of community-based monitoring methods to Gabon that has been proven successful in other countries.
- Strengthen their technical capacity to lead regional exchanges and serve as a backstop for other Central African countries.

### *Gabon Strategy Consultation*

A visit to the country was conducted earlier in 2019. During this visit AGEOS convoked members for the Ministry of Forest Economy, Waters, Fisheries, and Aquaculture, Ministry of Environment, WWF, the US Fish and Wildlife Service working with the CARPE Program. During these meetings, needs across all these institutions were identified. In addition, consultations with technical partners including USAID, Norway, CAFI, AfD, World Bank, FAO and GFOI have identified initial technical needs. Consultations with the Gabonese government and a broader set of technical partners is ongoing to further identify the specific role each partner can play in supporting the government. In these initial consultations, partners were interested and supportive of SilvaCarbon technical engagement. Additional consultations with former IP colleagues who worked on the previous EC-LEDS programming in Gabon and/or have worked with select Gabonese partners in the past have also been held to further understand historical context, key actors and technical gaps.

### *Republic of the Congo*

The Republic of Congo is covered by an estimated 22,334,000 hectares<sup>11</sup> of forests representing approximately 65% of the national territory. Historic rates of gross deforestation and forest degradation are relatively low but there is enough evidence that these rates will increase in the near future due to agricultural expansion, timber exploitation, mineral extraction and settlement and infrastructure development. In November 2000 the country adopted a law on the sustainable management of forests, built on the sustainable production of forest resources, while ensuring the conservation of forest ecosystems with a focus on biodiversity.

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<sup>11</sup> FAO. 2015. Global Forest Resource Assessment 2015. <http://www.fao.org/forest-resources-assessment/past-assessments/fra-2015/en/>.

Since 2008, the country has had several initiatives with the aim to reduce deforestation and forest degradation within the framework of the REDD+ process. This has included the elaboration of a national REDD+ strategy, a forest investment plan and an investment framework. It has also launched an Emission Reduction Program, which has been introduced into the pipeline of the FCPF Carbon Fund.

To support sustainable forest management objectives, the government has made several international commitments. Within the framework of the Bonn Challenge, RoC has committed to reforesting two million hectares of land. This initiative is managed by the National Program for Afforestation and Reforestation (PRONAR). The country has also ratified the Paris Agreement and efforts are under way to revise the Nationally Determined Contribution (NDC). Furthermore, efforts to strengthen the institutional arrangements and build human resource capacity for reporting under the transparency framework of the Paris Agreement are ongoing in the scope of the preparation of the Third National GHG Communication.

The country has been building its NFMS with an MRV component to monitor and measure changes in forest cover, ascertain the efficacy of measures to reduce deforestation and forest degradation, and access results-based payments. This responsibility has been given to the National Center for Inventory and Management of Forest and Wildlife resources (CNIAF).

The government has been accompanied in its efforts to sustainably manage landscapes and contribute to the stabilization of GHGs by various technical and financial partners: the World Bank in the scope of the Forest Carbon Partnership Facility (FCPF), FAO through the UN-REDD program, the French Development Agency through GEOFORAFRI/OSFACO projects, the European Space Agency through the Global Monitoring of Environment and Security - Forest Monitoring Service, World Resources Institute (WRI), Department of State / USFS Climate Fellows Program, etc. These initiatives are at varying levels of execution with the majority completed.

The SilvaCarbon program has since 2013 been supporting the government of RoC's efforts to build the NFMS. Key achievements in the last three years include:

- Setting up an MRV Cell with the attribution of roles and responsibilities;
- Elaborating a national plan for the development of the NFMS/MRV;
- Strengthening the capacity of members of the MRV Cell through targeted training on specific technical issues;
- Developing and providing monitoring and measuring tools for forest cover change assessment;
- Developing database infrastructure to facilitate data access and sharing.

The establishment of the MRV Cell within CNIAF has created the institutional framework to ensure uptake of technical assistance support and guarantee long-term sustainability. Going forward, it is important to increase the number of staff within the Cell to: ensure that there is sufficient expertise to cover main thematic areas in the NFMS development and functioning; consolidate key technical design decisions related to the NFMS; continue to strengthen the capacity of MRV practitioners on key technical issues; establish a suitable work environment to facilitate data access, analyses and sharing (provision of hardware, software, office equipment, internet, etc.); reinforce the collaboration with other institutions especially academia and research; enhance the involvement of women and other key stakeholders of sustainable management of forests in the monitoring, measuring and verification processes; and enhance the communication and dissemination of data and information (technical results) to enable informed decision making.

### *ROC Strategy Consultation*

The strategy is based on an exhaustive analysis of the progress in the development of the NFMS carried out by members of the MRV Cell (CNIAF). The analysis was carried out with the GFOI REDDCompass tool and all strategic documents elaborated in the scope of the REDD+ process, in particular, and climate change, in

general. These include, the national REDD+ strategy document, the Forest Investment Program, the National Investment Framework, the FREL submitted to the UNFCCC, the Second National GHG Communication (SNC) and the Self-Assessment of the SNC etc. On this basis, gaps in the system development were identified and an exhaustive work program elaborated. Further consultations were carried out with other national MRV practitioners from the Ministry of Forest Economy; Marien Ngouabi University and National Institute for Forestry Research. To ensure the proposed strategy is line with requirements of the National GHG Communication and the REDD+ Process, coordinators of the both initiatives were also consulted.

## Ethiopia

The SilvaCarbon program in Ethiopia was launched in FY19 to support the BioCarbon Fund's Initiative for Sustainable Forest Landscapes (ISFL) which is being implemented in the Oromia Region of Ethiopia. SilvaCarbon expertise will support agriculture, livestock and forestry sectors, in coordination with the USDA Foreign Agricultural Service, FAO, other World Bank initiatives in Ethiopia, the Norwegian Government, a suite of international institutions including UNDP, UNIQUE Forestry, CGIAR facilities (CCAFS, ILRI, ICRAF), Global Research Alliance (GRA), and local partners including the Environment, Forests and Climate Change Commission (EFCCC), the Oromia Forest and Landscapes Program (OFLP), Oromia Bureau of Agriculture, the Central Statistics Agency and local NGOs to ensure technical assistance is well coordinated and not redundant. Following on consultations with partners, SilvaCarbon priorities for FY20 were outlined as part of ten work packages to be implemented collaboratively with EFCCC, OFLP and FAO with support from ISFL, FCPF, and Norway. In addition, potential tools and methodologies to improve land use mapping were introduced to the five ISFL countries during an introductory ISFL workshop. The first stage of the Ethiopia workplan was to build the capacity to fully satisfy needs for bi-annual land cover change information through innovative use of the Landsat archive.

SilvaCarbon, in collaboration Google Earth Engine, delivered a technical exchange with the technical team from the Oromia region and the National REDD+ Program. The technical team learned about the use of Google Earth Engine platform to perform analysis of remote sensing data and the LandTrendr and CCDC mapping algorithms to map land cover change. The second technical exchange (postponed) aims to provide technical assistance at a jurisdictional level to integrate regional land use mapping into the full scope of the GHG inventory.

Throughout the five-year strategy period SilvaCarbon will continue to support and re-enforce the MRV system for the Oromia Forest and Landscapes Program. This may include technical support at both national and regional levels with a focus on institutional arrangements, enhancing mapping capacities, and strengthening GHG estimations through development of emission factors and improving data management, analysis and quality. Specific areas of SilvaCarbon support will be identified in partnership with government and other technical partners. This support will be complementary to the broader Oromia Forest and Landscapes Program, the multiple livestock MRV programs, and the national REDD+ MRV programming supported by Norway being implemented by the EFCCC National REDD+ Secretariat and FAO. The aim is support the diversification of the emission reductions that qualify to be sold under the ISFL program by meeting the emission reduction program IPCC tier 2 requirements.

## Ethiopia Strategy Consultation

The strategic priorities are in line with the Ethiopia Emission Reduction Program Document (ERPD). Additional partners were consulted in this process including the EFCCC, FAO, CCAFS/Unique Forestry, Colorado State University, the World Bank and IP detailers.

## Zambia

An ISFL country, Zambia is currently implementing an AFOLU jurisdictional emission reduction project in Eastern Province known as the Zambia Integrated Forest Landscape Project ([ZIFL-P](#)). Further, the country is finalizing its GHG inventory for its Third National Communication and Biennial Update Report (BUR) for submission to the UNFCCC. As part of the GHG inventory, the AFOLU sector was estimated to represent approximately 95% of Zambia's emissions.

IPCC requirements of the national GHG inventory and ZIFL-P includes MRV of emissions across all of the AFOLU sectors. While ZIFL-P only includes the Eastern Province, effectively establishing an MRV system would provide a model that can be upscaled and integrated into the national MRV framework which the Zambia Environment Management Agency plans to develop. Strengthened MRV will also assist in tracking progress in meeting Zambia's updated NDCs.

Forestry is currently the only AFOLU sector with existing country-specific activity data (AD) and emission factors (EFs) meeting BioCarbon Fund's Tier 2 emission estimation requirements for potential emission reduction purchases. Currently, agriculture, including livestock, emission estimates rely on default values and expert knowledge. Better capacity, AD and the development of EFs are required to generate potential emission reduction purchase incentives under the ISFL program for the agriculture sectors.

Zambia has the unique situation of having two USG-funded embedded technical advisors placed in the Zambia Environment Management Agency (ZEMA) and the Forestry Department, respectively. These technical advisors are instrumental in supporting the implementation of SilvaCarbon activities. Key achievements to date include:

- New forestry sector Activity Data collected and forestry sector Emission Factors developed in collaboration with FAO, USFS, the Forestry Department and ISFL.
- Land cover (change) maps for Zambia are currently under development through collaboration with Boston University.
- Enhanced AD collection and EF development for the most viable Tier 2 compliant subcategories for the Agriculture and Livestock sectors are currently under development.

### *Zambia Strategy Consultation*

The above content is based on knowledge gathered by embedded advisors in ZEMA and the Forestry Department, in close consultation with colleagues and senior management of the Forestry Department, ZEMA, Department of Agriculture, Department of Livestock, FAO, SilvaCarbon and the World Bank/ISFL.

Specifically, a gap analysis of the Zambian NFMS was carried out with the GFOI REDD-Compass tool with participation of the Forestry Department and ZEMA staff, ZIFL-P leadership and World Bank representation. Numerous meetings and interactions with representation of FAO, World Bank and SilvaCarbon have taken place to discuss approaches related to activity data collection and emission factor development. Further, there has been valuable interaction with partners such as Boston University related to activity data collection and land cover mapping. Lastly, field missions in the ISFL project area, Zambia's Eastern Province, were instrumental in understanding the reality on the ground.

## Asia Focal Countries

### Cambodia

The Government of Cambodia is committed to long-term forest monitoring in accordance to UNFCCC Good Practice Guidance that follows the principles of transparency, accuracy, consistency, completeness, and comparability. The relevance of the AFOLU sector for Cambodia is clearly depicted in the first NDC, which proposed increase of forest cover to 60% by 2030. Since the NDC submission in 2015, the Government of Cambodia demonstrated strong commitment towards the REDD+ processes, completing the main requirements for accessing result-based payments including: National REDD+ Strategy, FREL, NFMS, First Biennial Update Report<sup>12</sup>, and Safeguard Information System.

In early 2020, Cambodia with technical support from FAO officially started implementing the GEF CBIT funded project for “Strengthening capacity in the agriculture and land use sectors for enhanced transparency in implementation and monitoring of Cambodia’s Nationally Determined Contribution (NDC)”. The project will run until 2022. Under the FCPF umbrella, Ministry of Environment is currently finalizing the revised FREL<sup>13</sup> in an effort to increase the accuracy and transparency of forest and land cover mapping.

In an effort to further streamline the national MRV capacity, the Ministry of Environment (MOE) recently completed an internal re-organization, assigning the Department of GIS at MOE as the key technical department for providing and managing all forestry and land cover data. Technical MRV capacity at MOE has been built systematically in the past eight years, resulting with a very strong core team that has demonstrated ability to adapt number of methods in their mapping protocol, and willingness to collaborate with other departments. This includes work on improved mapping of main agricultural crops and improved management of environmental data.

SilvaCarbon support to Cambodia is currently limited to finalizing activities initiated in 2018<sup>14</sup>, and this has enabled the program to somewhat keep engaged. However, in order to capitalize on the past achievements and apply the MRV technical skills beyond REDD+ reporting and GHG-inventory, it is recommended to allocate new SilvaCarbon funding to work in Cambodia.

Contingent on funding decisions, SilvaCarbon aims to collaborate with the core team at MOE and with other government partners such as the Forest Administration and the Department of Agricultural Land Resources Management under the Ministry of Agriculture, Forestry, and Fisheries (MAFF). The nexus between agriculture and forestry sector is very important for Cambodia, as reflected in the country’s GCF portfolio (approved and pipeline). Main areas proposed for collaboration are: 1) Forest Landscape Restoration – identifying suitable FLR sites and supporting long term monitoring, 2) Strengthening capacity of DALRM to provide updated and improved maps of crops and cropping pattern changes as an input to AFOLU sector GHG-Inventory data, agricultural policy planning, and agricultural sector investment, and 3) Improved management and sharing of AFOLU data.

In addition to working closely with the relevant government agencies, in Cambodia, SilvaCarbon activities are implemented as an integrated part of the FCPF program, and in close collaboration with FAO and SERVIR-

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<sup>12</sup> Currently in final stages of approval before official submission to UNFCCC.

<sup>13</sup> The new FREL should be ready for internal review in July, 2020.

<sup>14</sup> FY19 and FY20 funds are not available for Cambodia activities.

Mekong. For the FLR activities it is also anticipated to have a very close collaboration with the USAID- Greening Prey Lang project. Collaboration with Universities is also expected to strengthen.

### Lao People's Democratic Republic

The importance of forest resources and their sustainable management is well recognized in the Lao PDR's policies, including the 8th National Socio-Economic Development Plan (8th NSEDP, 2016-2020), the Green Growth Strategy (endorsed in 2019), the Central Party Resolution on Land (2017), and the Forestry Strategy 2020. Lao PDR's NDC place significant weight on the forestry sector, establishing a forest cover target of 70%, and highlighting the need for regeneration of degraded forests.

Currently, Lao PDR is drafting the Forestry Strategy 2030 and is preparing for the submission of the second NDC. In December, 2019, the Department of Forestry, FAO, and the Green Climate Funds organized a stakeholders consultation meeting that reviews the progress in the past decade and outlined the main focal areas for the next one: i) social inclusion, ii) good governance, iii) market- orientation and green growth, and iv) restoration.

Building on the existing collaboration with the forest Inventory and Planning Division, the National University of Laos, and the JICA funded F-REDD Program, SilvaCarbon support to Lao PDR will focus on building national capacity to better monitor changes at landscape level, including better monitoring of forest degradation and regrowth. The support will be geared towards implementing the ERPD, and beyond that to strengthening FIPD technical capacity. Due to frequent changes in key technical personnel and lack of a core MRV team, FIPD has not been able to fully benefit from the exposure to new and improved methodologies and guidance and has not taken leadership role in driving the MRV process to the extend demonstrated by the other SilvaCarbon focal countries.

To help address this, SilvaCarbon support in Lao PDR will focus on: 1) step-by-step testing of time series methods, allowing FIPD to learn in details how they can adjust the methodologies to serve their objectives and resolving concerns from senior DoF management over consistency of the methodologies, 2) improved documentation, guidelines and SOPs, and 3) mentorship system that will pair NOUL and FIPD staff with technical experts to work on specific products (e.g., research publication, training manual, policy brief, etc.). In addition, Lao PDR counterparts have expressed significant interest in collaborating on the woman in forest carbon initiative, which should further contribute to strengthening on national forest monitoring capacities in the future.

### Nepal

In 2018, the Government of Nepal established the Ministry of Forests and Environment in an effort to streamline and coordinate the work of various departments responsible for different aspects of GHG emissions reductions. With the official approval of the Emission Reduction Program for Terai region that same year, the Government of Nepal further confirmed its commitment to REDD+. In 2019, the country adopted the National REDD+ Strategy and initiated work on improving the FREL to include emissions from forest degradation and enhancement. In parallel, through a multi-stakeholder process led by the Forest Research and Training Centre (FRTC), Nepal successfully revised and adopted a new, harmonized land cover classification.

REDD+ and ERPD implementation is managed through the REDD cell at the Ministry of Forests and Environment, with the technical lead from FRTC, which is responsible for the overall management of Nepal's NFMS. FRTC is currently preparing the State of the Forest (2015-2020) report, which is the most comprehensive overview based on remeasurement and analysis the sample plots within the Forest Resources

Assessment (FRA) system. In addition to reporting on the same metrics from the 2010-2015 period, FRTC has identified the need to expand and start generating additional information on that will be useful for broader range of users and stakeholders. FRTC has been tasked with generating information beyond the extend of forest cover and forest cover change at national level, and support processes such as ecosystem mapping, supporting land use planning, assessing community forestry activities, etc.

SilvaCarbon has been providing direct support to FRTC throughout the development of the NFMS. For the next period the focus will be on collaborating with FRTC in the following areas: 1) FRA data analysis, reporting, and management, 2) Developing number of technical guidelines and SOPs for data collection, processing and management, 3) Expanding the use of open source tools and methods beyond forest cover change mapping through promoting collaborative research on topics such as biomass modeling, community forestry and agro-forestry.

SilvaCarbon activities in Nepal are implemented in close collaboration with SERVIR-HKH allowing FRTC to both contribute and benefit from the development and implementation of the Regional Land Cover Monitoring System for the Hindu Kush Himalayas region.

## Indonesia

Indonesia has been participating in SilvaCarbon regional efforts since the Asia regional program began in 2013, sharing country experiences at regional workshops and trainings. In the FY20-25 period the Asia program will seek to expand opportunities for Indonesia specialists to share their work and address emerging challenges in accordance with the broader aims of the SilvaCarbon program globally.

In addition, SilvaCarbon Asia will provide dedicated support to the Biocarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) in the Jambi Province. Initiated in 2017, the ISFL Jambi program aims to promote reduced GHG emissions from the land sector, from deforestation and forest degradation in developing countries and from sustainable agriculture, as well as smarter land-use planning, policies, and practices.

In support of carbon accounting and MRV activities, the ISFL Program is collaborating with SilvaCarbon at the global level to identify and address the key technical needs of all countries participating in the program. In October 2019, SilvaCarbon and Jambi ISFL counterparts convened an initial workshop with representatives from national and provincial level to review the progress to date and discuss the monitoring, analysis, and reporting (MAR) for ISFL Jambi program. The workshop highlighted that the MAR for ISFL Jambi Program will be aligned to the national MRV system. This includes working within the national registry system (Sistem Registry Nasional, or SRN) and Safeguards Information System (SIS) developed by the Directorate General of Climate Change to facilitate the reporting of sub-national mitigation actions, resources, and safeguards related to REDD+. The SRN system is also potentially to monitor double-counting of intervention programs within the Jambi Province. Following the workshop, and the approval of the pre-investment grant, ISFL Jambi team and SilvaCarbon continued to engage through periodic discussion and exchange of updates in order to plan where SilvaCarbon support would be most useful, i.e.:

- Indonesia is preparing to submit the second FREL at the end of 2020, with a strong focus on improving the emission factors, including emission factors for peatlands and mangroves with support from the Sustainable Wetlands Adaptation and Mitigation Program (SWAMP).
- The official activity data for the Jambi program is harmonized with the maps generated by the Ministry of Environment and Forestry (MOEF). As MOEF continues to adapt new methods and improve the

mapping protocols in order to meet recommendations for increased transparency and accuracy, SilvaCarbon can provide related capacity building at both national and Jambi provincial level.

- In addition, there is interest to build capacity at Jambi provincial level to work with open source tools and platforms for landscape level monitoring.
- There is a strong need to support ISFL Jambi team to design and adapt protocols for field data collection and analysis for improved emission factors.
- Agricultural land use is not yet incorporated in the Jambi Province ISFL. SilvaCarbon through USDA/FAS can provide targeted technical support to government technical focal points in Jambi Province and nationally to enhance capacity to assess emissions from the agricultural sector to a level where emissions from changes in land management can be accurately captured and reported on. A TOT approach on issues related to GHG-Inventory is preferable to allow sharing knowledge from central to provincial level, integrating latest guidance and ensuring consistency.

### Vietnam (Country Program)

The Government of Vietnam has been committed to the REDD+ process for over nine years. Since 2013, the SilvaCarbon Program has supported this process by assisting with the development of the NFMS, which is required for REDD+ and a variety of other natural resource management and conservation objectives. Vietnam's collaboration with SilvaCarbon focuses on building the capacity of in-country technical teams, and has resulted in significant, long-term improvements across the NFMS pillars.

Vietnam is now preparing an application for result-based payments through the Green Climate Fund. Ensuring the transparency and quality of GHG estimates is essential for the successful implementation of the emission reduction program, and its long-term sustainability. In response, SilvaCarbon and FIPI organized series of training sessions at national and sub-national level to develop, test, and implement QA/QC procedures for data collection. As a result, the Forest Inventory and Planning Institute (FIPI) is now fully confident in the quality of the field data and has a strong understanding of the main areas for future improvement.

Vietnam's NFI is one of the key components to the NFMS. The current NFI cycle (NFI5) is now finalized and FIPI is preparing for the start of NFI6 at the beginning of 2021. NFI6 is expected to provide information for multiple purposes such as policy recommendations for managers, investment decisions by businesses and in addition to REDD+, it is expected supports other policies and strategies such as large certified timber plantation, PFES, MRV for REDD+, seed strategy, improved productivity, forest planting strategies, etc.

One of the key issues that the SilvaCarbon program has been trying to address is the different reporting under REDD+ and for the National Communication. In early 2020, the Government of Vietnam clarified the responsibilities for land cover mapping for GHG-Inventory, confirming the National Remote Sensing Department (NRSD) under MONRE as the focal agency for preparing all land cover data, including forestry data. NRSD has been part of different capacity building activities organized by SilvaCarbon in the past, and the technical team expressed strong interest to learn about the UMD Global Land Analysis and Discovery (GLAD) system and open source tools.

SilvaCarbon will continue to support the Government of Vietnam to make informed, strategic decisions about forest resource management and forest monitoring and related investments. The focus for the next period will be on: 1) Supporting the planning and implementation of different aspects of NFI6, including support to better serve the need of different stakeholders, including private sector, 2) TOT approach for building and retaining capacity for harmonized land cover change mapping, including stronger focus on building NRSD remote sensing capacity and working with open source tools and methods, 3) TOT and technical backstopping to

Vietnam's Department of Climate Change to improve the GHG-estimates from the AFOLU sector and 4) Support the development of real time/ early warning system for detecting illegal logging.

In addition to the strong focus on TOT, in the next couple of years, SilvaCarbon will increase the collaboration with Vietnam's academic and research institutions, particularly around supporting innovative research and creating training materials. It is also expected that the SilvaCarbon program in Vietnam will expand the collaboration with different departments under MARD and MONRE, such as the Forest Protection Department (in the area of real time monitoring) or the Agriculture Department in the area of improved information from the agriculture sector. Activities related to agricultural data will be implemented in collaboration with USDA/FAS. SERVIR-Mekong is expected to remain a close implementing partner in Vietnam.

It is proposed to keep Vietnam as a separate country program, with a similar level of funding, in order to keep the strong level of engagement in this important period of starting the new NFI cycle and entering into REDD+ implementation. In addition, due to the strong technical team existing at central level, Vietnam is a good candidate for testing a more comprehensive TOT model both nationally and in the Mekong region.

## Pacific Region

USG has recently initiated two new activities in the Pacific region: 1) the Pacific Island Forest Restoration Initiative (PIFRI), and 2) the Fiji Climate Fellow Program. The scope and objective of these initiatives offer number of opportunities to expand the support, both through involving technical specialists from the Pacific region in regional workshops and trainings as well as leveraging SilvaCarbon expertise to support the implementation of specific activities in the region. In particular, SilvaCarbon has opportunities to work on issues related to forest landscape restoration and on mangrove mapping and monitoring.

## Latin America and Caribbean Focal Countries

### South America

The SilvaCarbon strategy for Peru, Colombia, Ecuador, and Paraguay outlines past and potential future SilvaCarbon programming for the countries and provides a working model for similar strategies that may later be developed for other countries in LAC. While the strategic priorities and expected outcomes are the same for the region, the work plans and specific activities for each country will be tailored to the individual circumstances of each country. This region has benefitted from substantial local/regional buy-ins totaling nearly 3 million dollars.

The countries share similar MRV development challenges and can utilize similar forest monitoring methodologies and technologies. For example, Peru is currently working with counterparts in Colombia and experts from SilvaCarbon to redesign their NFI, and mapping protocols from Colombia have been shared with Peru, in collaboration with experts from SilvaCarbon, to help Peru improve the speed in generation and accuracy of its maps.

Additionally, in Colombia, Peru, Panama, and Paraguay, SilvaCarbon inventory experts have also provided both in-person and remote technical assistance on the countries' national forest inventories (NFIs) and worked to identify opportunities for improvement of the NFIs. Peru is nearing completion of its first NFI cycle, while Colombia is in the early stages. Ecuador and Paraguay are lagging behind somewhat in mapping capabilities but have completed one NFI cycle and are working on cycle 2. However, their current designs only place plots inside of forest areas, limiting change over time estimations.

Peru and Colombia have generated forest/non-forest maps for various years dating as far back as 1992 (Colombia), and both countries have the capability to produce maps at annual or biennial time steps that can be used for tracking forest loss. Ecuador has this capacity within a donor supported program. Paraguay has areas for improvement in this arena.

The countries' MRV systems are not yet fully operational and are not funded directly with national resources – both rely heavily on international cooperation for technical and financial support. Additionally, the data produced by the countries' forest MRV systems is not yet fully linked to national GHG inventory processes, and the data is being adopted slowly by policymakers for use in estimating national references levels and REDD+ scenarios due to national capacity limitations.

## Central America

Honduras is in the middle of the third cycle of the NFI. The first NFI was completed in 2006 and was conducted by the UN Food and Agriculture Organization (FAO) for COHDEFOR (precursor to ICF). The second was designed and conducted by ICF with technical and financial assistance from FAO. While it was built upon the initial survey, there were several enhancements. For the third NFI, ICF received technical assistance from USFS on the design. ICF has completed 3 of the 5 years of data collection for the third cycle. Due to the design, this subset of plots is representative of the entire country, and thus can be used for estimation. Honduras has undergone a tremendous effort to institutionalize its inventory to allow the inventory to continue to exist and function. As the country continues to advance with its NFI, it is now looking at how to better display the results from these cycles and will work with SilvaCarbon on methods to transparently share data from the NFI. Guatemala has been working with SilvaCarbon and Honduras to develop their NFI and is nearly ready to begin its implementation.

Costa Rica has been developing its National Land Use, Land Cover, and Ecosystems Monitoring System (SIMOCUTE) since 2015 and has made significant progress in developing and implementing SIMOCUTE's various subsystems. An executive decree has been under development for more than two years to officially adopt the monitoring system. SilvaCarbon funding helped produce a final draft of the document. It is anticipated that the decree will be signed by early FY21. During this reporting period, SilvaCarbon has been working on the process of strengthening SIMOCUTE as it transitions from the design to implementation. This has been accomplished through workshops and technical assistance exchanges. This reporting period, the National System of Conservation Areas (SINAC) made significant progress toward preparing to implement the first remeasurement cycle of its NFI using a modified sample design proposed by the USFS through SilvaCarbon funding. Preparations include acquiring equipment, designating leadership, and establishing a coordination committee. In conjunction with the NFI, SINAC is also preparing to create an updated forest type map. Training and validation data for this map will be collected by interpreting land use and land cover from SIMOCUTE's systematic grid of 10,600 plots. SilvaCarbon provided an initial training to support this effort and will support additional trainings during the upcoming reporting period. Both the NFI and forest type map should contribute to improved emission factors and estimates of forest carbon and associated changes. SilvaCarbon funding has also supported the further development of an Excel spreadsheet that shows the step-by-step procedures for analyzing the NFI data using the new design. An updated spreadsheet will be delivered to SINAC next reporting period. The country is also much better equipped to analyze data produced by their visually-interpreted, sample-based land use and land cover monitoring system thanks to the SilvaCarbon program, which trained a Costa Rican university professor in the methodology (previous reporting period), who then documented the methodology (delivered this reporting period), modified scripts to perform the analysis, and delivered trainings in Costa Rica on the analysis procedures (previous reporting period). As a follow-on to this effort, Costa Rica has initiated a pilot study to further refine the sample-based area estimation subsystem of SIMOCUTE and

provide start-to-finish training to a broad group of professionals that are interested in using the data for a variety of purposes, including for activity data for REDD+ in the future. SilvaCarbon financed one workshop to kick-off the pilot study during this reporting period and will provide a series of additional trainings during subsequent reporting periods.

Mexico is working on further developing land monitoring systems based on visual interpretation of land use from a systematic of plots, using high-, and some cases moderate-resolution imagery. Mexico is using the Collect Earth platform to interpret these plots. These monitoring systems will provide critical data for the country's REDD+ program, GHG reporting, and potentially other initiatives. SilvaCarbon has helped to compile and review recommendations for Mexico's sample-based area estimation program. SilvaCarbon has also provided similar technical assistance to El Salvador and Panama, which is using the Collect Earth Online platform, to help analyze sample-based area estimation data.

The countries' MRV systems are not yet fully operational and are not funded directly with national resources – both rely heavily on international cooperation for technical and financial support. Additionally, the data produced by the countries' forest MRV systems is not yet fully linked to national GHG inventory processes, and the data is being adopted slowly by policymakers for use in estimating national references levels and REDD+ scenarios due to national capacity limitations.

## Annex 2: COVID-19 Considerations

At the time of the drafting this Strategy, due to COVID-19, there are travel restrictions and social distancing guidelines in place that drastically change the way that the program is implemented. Since March 2020 many activities have been postponed, put on hold, or whenever possible implemented through remotely based support (e.g., conference calls, webinars, document reviews).

### Africa

The implementation of the SilvaCarbon Africa Program has adapted to the new COVID-19 reality. An initial slowdown in activities in early 2020 was inevitable, but it also presented an opportunity to focus on program planning and strategy development. As countries have slowly been re-opening the program has resumed implementation of activities in an adapted format. SilvaCarbon Africa has the advantage of hosting country coordinators in Cameroon, Democratic Republic of the Congo, and Republic of the Congo and technical advisors in the Republic of the Congo and Zambia. Trainings have been taking places in two forms. First, trainings involving international experts from the US and elsewhere have been moved online. Second, as is in line with the strategic approach outlined, where possible, locally-based experts are being drawn upon to facilitate trainings and support the implementation of selected activities.

The safety of partners and staff are of utmost importance, and in all cases SilvaCarbon follows country-specific guidelines on gathering size, social distancing requirements, etc. In addition, the program is budgeting for and providing masks and hand sanitizer and other safety precautions for all trainings where participants are physically present. This approach has presented unforeseen advantages, including 1) reducing the program's GHG emission footprint from reduced travel, and 2) allowing for more time and attention on the development of forest monitoring training materials and Standard Operating Procedures, a key objective that is often otherwise de-prioritized relative to other activities. Online trainings are being recorded and made available for continued learning to participants as well as partners in other countries.

As the pandemic continues to evolve the Africa Program will continue to adapt to ensure the safety of staff and partners while advancing activity implementation through creative new approaches.

### Asia

As some of the countries in the Mekong region open up and prepare to resume business as usual, SilvaCarbon is planning several TOT events that will be led by counterparts in the region with technical backstopping from US experts.

While it is difficult to predict how the future of the program will look if the COVID-19 restrictions extend well into FY21, there are two main consideration that should be fully explored even if international travel and in-person gatherings become possible:

- There is a strong need and interest by SilvaCarbon country partners to work on improved documentation of protocols and technical processes and to collaborate on data management issues. This type of support can be done remotely, and SilvaCarbon should consider whether there is any need or opportunity to create virtual working groups that can also be engaged in sharing best practices.
- South-South collaboration and sharing experience and expertise among the countries can become a significant focus of future activities. Through previous and ongoing collaboration on a multitude of different activities, the SilvaCarbon Asia program is now able to identify the relative strengths (and

weaknesses) of different country teams. For example, there is a clear, valuable opportunity to share and replicate lessons from Vietnam's NFI work, Nepal's land cover harmonization, Cambodia's creativity in combining different approaches for their FRELs, or Indonesia's nationally-driven approach to systematic MRV data management. The FY21 work plan outlines a number of South-South and TOT-driven activities that can be further expanded in the future.

These two areas of work have also been discussed with the countries prior to COVID-19 as important elements for ensuring sustainability and institutionalizing different tools, approaches, and knowledge sets. In addition, if successful, these approaches will offer valuable lessons and guidance for preparing to graduate the current model of knowledge transfer and collaboration in the Asia region.

## Latin America and the Caribbean

At the time of the drafting this Strategy, due to COVID-19, there are travel restrictions and social distancing guidelines in place that drastically change the way that the program is implemented. Since March 2020 many activities have been postponed, put on hold, or whenever possible implemented through remotely based support (e.g., conference calls, webinars, document reviews).

While it is difficult to predict how the future of the program will look if the COVID-19 restrictions continue well into FY21, two main considerations should be fully explored even if international travel and in-person gatherings become possible:

1. There is a strong need and interest by SilvaCarbon country partners to work on improved documentation of protocols and technical processes and to collaborate on data management issues. This type of support can be done remotely, and SilvaCarbon should consider whether there is any need or opportunity to create virtual working groups that can also be engaged in sharing best practices.
2. South-South collaboration, i.e. sharing of experience and expertise among SilvaCarbon country partners, can become a significant focus of future activities. Through previous collaboration on many different activities, the SilvaCarbon LAC program is able to identify the relative strengths (and weaknesses) of different country teams. The FY21 workplan outlines some South-South activities that can be further expanded in the future.

These two areas of work have also been discussed with country partners prior to COVID-19 as important elements of ensuring sustainability and institutionalizing different tools, approaches, and knowledge sets. In addition, if successful, these approaches will offer valuable lessons and guidance for preparing to graduate the current model of knowledge transfer and collaboration in the LAC region.

## Global

The COVID-19 Pandemic presents both similar and different challenges to the Global Program than the three regional Programs.

1. The Global Program supports the participation of US Government experts and US universities partners in technical working groups. These groups bring together leading experts from around the globe to address challenges related to forest and carbon MRV and provide guidance for countries. Pre-COVID, scientists would meet physically a few times a year and work remotely in between the meetings. Due to COVID-related travel restrictions, the teams have been exclusively working remotely since March 2020. This has resulted in lower carbon emissions, decreased project expenditures, and slightly less fluid collaboration. As people are gradually becoming more accustomed to remote collaboration, the

productivity will likely improve. Travel to international conferences has also entirely ceased due to the COVID-19 Pandemic. In the past, these international conferences have served as useful convening events for south-south exchanges, working groups, and strategic planning. The Global Program has had to be very deliberate in seeking other opportunities for these sorts of interventions, such as webinars, conference calls, and virtual workshops.

2. As the Regional Programs shift towards remote training opportunities, the Global Program is developing eLearning materials. The topics for these materials are identified based on feedback from SilvaCarbon partners and Regional Programs and directly respond to training needs. The Global Program is also using different tools and approaches (e.g. webinars, PowerPoints, websites, manuals, videos).
3. The Global Program serves as the SilvaCarbon Program Secretariat and regularly convenes meetings for a wide variety of reasons (e.g. Brown Bag presentations, Technical Team Calls, Work Planning, Strategic Planning, Steering Committee Meeting, Periodic Check-Ins). These meetings have shifted from hybrid formats (in-person and virtual) to entirely virtual.

Like the Regional Programs, the Global Program will continue to develop and learn about different approaches for remote learning and collaboration, many of which will continue to serve SilvaCarbon in a post-COVID-19 future.