

▶ LIVING SOILS OF THE AMERICAS

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Introduction

The capture and sequestration of atmospheric carbon dioxide (CO₂) is an important ecosystem service. Large amounts of carbon are stored in natural forests and wetlands, yet soils store the largest amount— approximately 80%—of the terrestrial carbon stocks. Unfortunately, soil degradation is a significant problem in Latin America and the Caribbean (LAC) often due to erosion, salinization, compaction land use practices, deforestation, and the impacts of climate change.

Meeting the Sustainable Development Goals by 2030, as well as the commitments countries have made in their Nationally Determined Contributions (NDC) developed in response to the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification (UNCCD), including its land degradation neutrality (LDN) goals, requires significant participation from the agricultural sector and immediate action to prevent, reduce, and reverse land degradation.

Improving soil management and increasing organic matter (SOM) levels and soil health can contribute to decreasing greenhouse gas (GHG) emissions and sequestering soil organic carbon (SOC); strengthening the soil nitrogen (N) cycle and positive impacts such as enhanced fertility and productivity, increased soil biodiversity, and reduced erosion, runoff and water pollution; and can help to buffer crop and pasture systems against the impacts of climate change (Paustian, K et al. 2016)¹.

Living Soils of the Americas (LiSAM) is a timely international and multi-stakeholder initiative to fine-tune, apply, and adapt methodologies and technologies to sequester SOC across a diversity of agricultural systems, embracing the holistic One Health approach and increasing the benefits provided by agri-food systems. It aims to provide policymakers, farmers, and other actors across the value chain with the tools to assess and increase the environmental services that agriculture can provide through improved soil management in support of achieving the SDG, NDC, and LDN goals.

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LiSAM initiative

LiSAM will facilitate collaboration among agricultural stakeholders, scientists, and donors to address the challenge of demonstrating that SOC sequestration in agricultural lands is one of a few strategies that could be applied at a large scale and, potentially, at low cost, to benefit farmers while contributing to the goals set at the Conference of the Parties - UNFCCC negotiations in December 2015. Figure 1 captures the initiative's proposed conceptual framework.

Launched on World Soil Day in December of 2020, this initiative has a five-year time frame². It will be operationalized through public-private partnerships to implement land management and carbon projects across the different agro-ecosystems and regions of Latin America and the Caribbean. It is intended to respond to the needs and collaboration opportunities of main partner organizations and agricultural stakeholders.

(1) Paustian, Keith, Johannes Lehmann, Stephen Ogle, David Reay, G. Philip Robertson, and Pete Smith. "Climate-Smart Soils." *Nature* 532, no. 7597 (April 6, 2016): 49–57. <https://doi.org/10.1038/nature17174>

(2) <https://iica.int/en/press/news/rattan-lal-and-iica-launch-living-soils-americas-initiative>

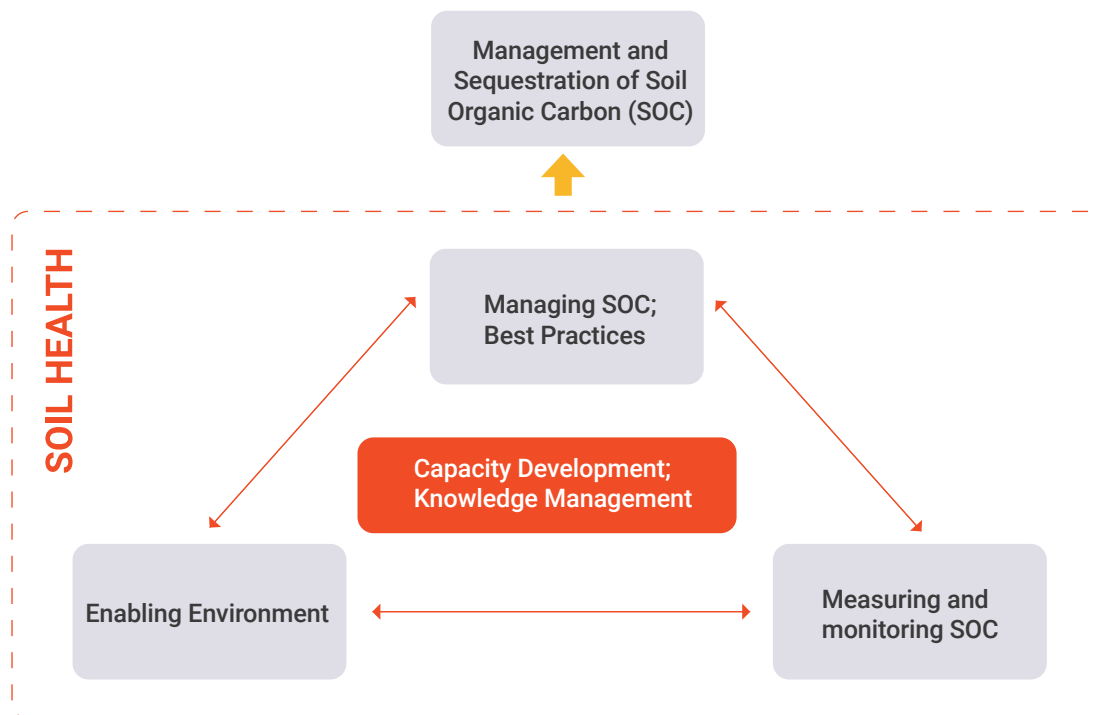


Figure 1: The initiative's conceptual framework

A big challenge to achieving the aforementioned goals and for agriculture to participate in carbon projects is the lack of dependable, credible, and cost-effective methods for monitoring changes in soil carbon. Validating protocols for Management, Reporting and Verification (MRV) in SOC and developing baselines, soil sampling capacities, and guidelines for interpretation, use of proxies and other indirect carbon assessments are vital for helping to advance towards compensating farmers for SOC maintenance and sequestration.

The initiative's **Measuring and Monitoring line of action** will provide answers to these challenges, as well as practical solutions to test and implement ongoing protocols within the related projects. The LAC region has a significant amount of knowledge and experience in land management practices. The application of MRV to assess carbon sequestration under specified practices and conditions will provide valuable information to policymakers to feed into other national climate change strategies. Innovative digital tools will be key to measuring and monitoring SOC at the scales necessary.

The **Best Practices for SOC Management component** aims to build the capacity of public and private extension agents, farmers, and other groups that are part of the initiative to improve soil health in agriculture. One strategic line of action is to **foster an enabling environment for SOC management and sequestration**. Capturing the benefits of a healthy soil on farm or at the landscape level is an important goal, but alone is unlikely to achieve the desirable changes in the agricultural systems required to reach NDC targets. To reach the proposed mitigation and resilience goals, the actions that will be required to engage agricultural stakeholders include policies and incentives, developing payment for ecosystem services (PES) schemes, promoting carbon offset markets, and developing carbon infor-

mation networks. Moreover, to integrate SOC into international climate change mechanisms, it is important to map the opportunities and to fully understand the actions required by agricultural leaders.

In this sense, the initiative seeks to manage knowledge on the best agricultural practices associated with maintaining and increasing SOC stocks and other ecosystem services, which are key to strengthening the region's agricultural systems. LiSAM will work to link different initiatives in the region to increase the impact and accelerate actions in favor of soil health for more sustainable agri-food systems in the face of climate change.

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Main implementing partners: IICA – CMASC

This Initiative offers a unique opportunity as it will have the scientific and technical backstopping of the Carbon Management and Sequestration Center at The Ohio State University (CMASC), as well as the network of the Inter-American Institute for Cooperation on Agriculture (IICA), comprising 34 country delegations that operate in close cooperation with the Ministries of Agriculture and other sectoral ministries to respond to the most pressing agricultural challenges in the hemisphere.

IICA was founded in 1942 and is the specialized agency of the Inter-American System that supports the efforts of its Member States to achieve agricultural development and rural well-being. IICA works to strengthen the capacities, institutions, policies and planning processes of the agricultural sector. The Institute functions as a bridge between countries, scales and actors to promote a common agenda that will allow for progress towards achieving the multiple agri-environmental goals of each country detailed in the NDCs developed in response to the Paris Agreement of the UNFCCC, the LDN goals set under the UNCCD, and the SDGs.

CMASC, directed by Dr. Rattan Lal, is one of the leading global research centers providing comprehensive, interdisciplinary research on terrestrial carbon management and sequestration techniques and technologies in agriculture. Dr. Lal and his team will provide overall technical guidance based on their 20+ years of experience in over 40 countries. Dr. Lal has authored/co-authored over 1,000 refereed journal articles and 560 book chapters, and 100 books. Dr. Lal has mentored 112 graduate students and 180 international visiting scholars. In 2020, he received the prestigious World Food Prize.

Together, IICA and CMASC will provide sound institutional support to work with governments to open a pathway to scale up best management methods and to develop policies and regulations aimed at recuperating soil health and quality and maintaining soil carbon stocks.

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Main Expected Results

Overall objective: To support the agricultural sector in reducing GHG emissions from agricultural systems by increasing the area of cultivated land under validated soil management practices related to soil health indicators that provide ecosystem services.

Overall impact: To increase land cultivated under management practices that increase soil carbon stocks, thus enhancing productivity and resilience of farms and farmers and global food security while contributing to greenhouse gas mitigation efforts.

STRATEGIC/ THEMATIC AREAS	ACTIONS	OUTPUTS AND RESULTS
Measuring and Monitoring SOC	<ul style="list-style-type: none"> Develop an applied research agenda with academic partners relating SOC with soil physical properties (bulk density), productivity, biological activity, vegetation cover, and soil carbon sequestration rates Advance SOC baselines of the main agricultural ecosystems based on the literature and ongoing work of main research actors Promote the use of spatial databases, remote sensing and SOC models Develop capacity within the key players in carbon science 	<ul style="list-style-type: none"> Countries use verified MRV protocols for soil carbon sequestration tested in the field and validated by CMASC Easy-to-use GHG quantification tools for field projects Knowledge of SOC stocks of the main agricultural ecosystems Knowledge of soil structure and SOC interactions; relevance of surface vs. belowground biomass residues in Soil Organic Matter (SOM) dynamics
Soil Policies and Regulations	<ul style="list-style-type: none"> Support carbon PES, certification and green labelling schemes with farmers implementing sustainable land management (SLM) practices Promote market mechanisms for SOC Advance soil health policies 	<ul style="list-style-type: none"> Achieve SOC sequestration targets Local governments implement effective land use regulations Countries integrate soils into their NDCs and GHG programs to contribute to both adaptation and mitigation goals
Best Management Practices (BMPs)	<ul style="list-style-type: none"> Assess what has already been done in LAC and systematize Lessons Learned (no-tillage, improved crop rotations, service crops, nutrient management, agroforestry, organic amendments etc.) Evaluate BMPs using soil health indicators and productivity indexes Promote conservation agriculture practices and prevent deforestation Support scaling: use multi-stakeholder platforms including farmer associations, the private sector and state agencies Promote land restoration/conservation projects 	<ul style="list-style-type: none"> Operational toolboxes Databases and maps Landscape/regional targets of area under BMPs Increase in SOC stocks due to the adoption of best management practices

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Governance Structure

The main objective is to ensure that LiSAM provides an effective, strategic, and technically sound contribution to advancing soil health for the benefit of the Americas, as shown in Figure 2.

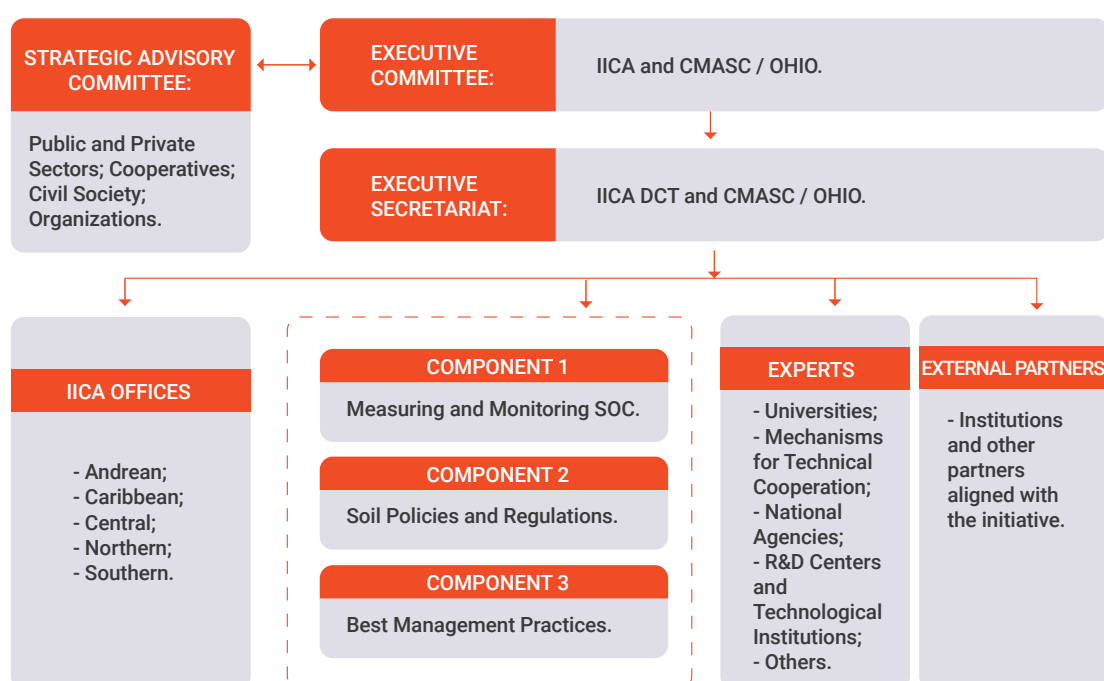


Figure 2: LiSAM Governance

The Executive Committee (EC) will: i) Provide close oversight of LiSAM operations and activities and guidance to the Executive Secretariat, which will act as the leader of the initiative; ii) Provide input to key strategic documents (framework, workplan, papers, proposals); and iii) Catalyze the initiative's first year, ensuring efficient and effective planning and operation.

The Strategic Advisory Committee (SAC) will: i) Validate and oversee the overall direction of LiSAM; ii) Guide and orient the implementation and outcomes of LiSAM; and iii) Provide strategic and technical advice to create synergies with other ongoing efforts.

The Executive Secretariat (ES) will: i) Execute the activities of the LiSAM initiative; ii) Act as the technical secretary for the meetings proposed by the EC and SAC; iii) Coordinate relations with additional partners and other ongoing initiatives; and iv) Coordinate relations with IICA's offices and co-lead the actions in the countries.