

CIFOR-ICRAF SCIENTIFIC SOLUTIONS FOR THE CLIMATE CRISIS



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Challenge	What our scientists say
Climate crisis	<ul style="list-style-type: none"> Grow climate-neutral, adapted and resilient societies that put people and nature first Widely adopt nature-based solutions, such as agroecology, agroforestry, community-based forestry and payment for ecosystem services
Food-system crisis	<ul style="list-style-type: none"> Transform agri-food systems using the above approaches and strengthen local value chains and security of land tenure for smallholders
Lack of resilience	<ul style="list-style-type: none"> Deploy integrated landscape approaches across all sectors and all interests to ensure inclusive, efficient and effective actions that transcend sectoral interests
Increasing natural disasters	<ul style="list-style-type: none"> Reduce the severity, frequency and impact of disasters by designing landscapes to be multi-functional, providing both mitigation and adaptation services, protecting ecosystems and agri-systems

CLIMATE FACTS

Fact	Challenge	Solution
Forests are both a cause of, and a solution for, greenhouse-gas emissions	Deforestation and land-use-change cause up to 20% of all greenhouse-gas emissions, more than the world's entire transport sector.	<ul style="list-style-type: none"> Felling less trees, logging more sustainably and restoring trees and landscapes will contribute to reverting the carbon sequestration ability of forests.
Current carbon-removal plans are not ambitious enough	If the Paris Agreement is to be met, countries will need to remove a billion tonnes of CO ₂ from the atmosphere by 2025 and more than 1 billion tonnes annually thereafter. But the list of projects in development could result in only around 150 million tonnes of CO ₂ by 2025, well short of what's needed.	<ul style="list-style-type: none"> Nature-based solutions provide effective solutions to increase carbon sequestration and ensure sustainable economic development.
The world has natural carbon sinks, currently not adequately addressed	Addressing these neglected and degraded carbon sinks requires concerted, transboundary efforts.	<ul style="list-style-type: none"> Wetlands, including peatlands, mangrove forests and seagrass meadows, are among the most carbon-rich landscapes on Earth, storing 3-to-5 times more carbon than other tropical forests. Peatlands cover only 3-to-5% of the Earth's surface but store over 30% of all soil carbon. In Indonesia, blue-carbon mangroves could help reduce emissions by as much as 200 million tonnes of CO₂ annually, the equivalent of 30% of its emissions from land. By managing farmland soil better, the top 30 centimetres of soil could increase and store an extra 0.9–1.85 gigatonnes of carbon every year. This is equivalent to the carbon emitted by the global transport sector.
There is a widespread lack of knowledge about how to apply nature-based solutions	Farmers, governments and the private sector mostly lack capacity to implement nature-based solutions at all levels.	<ul style="list-style-type: none"> In Viet Nam, farmers using climate-smart agricultural methods increase their rice yields 9–15%, use 70–75% less seeds, 20–25% less nitrogen fertilisers and 33% less water. Many countries also report that climate-smart agricultural methods reduce emissions 20–62%. Sequestering an average 8.4 tonnes of carbon per hectare per year, agroforestry could sequester 8 billion tonnes of carbon per year globally, equivalent to 40% of a decade of fossil-fuel emissions from the UK, Germany, France and Canada combined in the 2010s. Biomass, such as waste from forests and farms, can be used to generate energy without net contributions to global emissions. Bioenergy can produce at least 25% of global energy demand and contribute to mitigation through reducing emissions in the energy sector.

KEY CLIMATE RESEARCH

Our research-in-development work covers a wide range of areas critical to climate mitigation and adaptation

- Developing effective and efficient ways to regenerate degraded land with farming and forest communities, restoring ecosystems and making agricultural land productive and biodiversity friendly.
- Integrating trees into agricultural systems, combining old and new technologies and ways of working to ensure that farmers' livelihoods are improved along with the environment.
- Providing the evidence for designing and implementing 'green' commodity supply chains.
- Developing ways of making sustainable bioenergy.
- Pioneering work on an agroecological transformation of our food systems to decrease the negative effect on climate.

A FEW EXAMPLES OF WHERE AND HOW

- **REDD+ and deforestation:** The Global Comparative Study on REDD+ (GCS-REDD+) Phase 4 (2021- 2023) focus on knowledge for action to protect tropical forests and enhance rights. It builds on CIFOR and partners' long-term GCS-REDD+ since 2009, which has produced science-based information, analysis and tools to promote effective, efficient and equitable (3E) outcomes in REDD+ implementation, including secure rights and livelihoods for indigenous peoples and local communities. The ultimate aim is for policymakers and practitioners in key tropical forest countries to design and implement 3E forest-friendly policies and actions, based on the knowledge and capacities co-developed through this project.
- **SWAMP and blue carbon: countries in the Global South.** We are [informing policy makers](#) on the role of tropical wetlands in adaptation and mitigation strategies, providing critical information on ecosystem values, how to more effectively conserve and restore, and increasing awareness of the potential role of these ecosystems in mitigation and adaptation.
- **Yangambi Landscape: carbon monitoring, climate-smart agriculture and renewable energy in the Congo Basin, Africa.** The Landscape is emerging as a global reference for [restoration, climate-smart agriculture and renewable energy](#) through [strong partnerships](#).
- **Ecosystem-based adaptation: climate-resilient, natural-resource-based economy for Africa.** Building climate-resilient rural communities in the Gambia and facilitating the development of a sustainable natural resource-based economy.
- **Bioenergy in Africa and Southeast Asia. Harnessing renewable energy** by investigating sources of bioenergy production that contribute to food production and environmental conservation in Sub-Saharan Africa and Southeast Asia.

Learn more

See our [climate change and COP26](#) webpage for more information about all of the above.

OPPORTUNITIES TO COLLABORATE WITH US

We have created more than 20 interdisciplinary global alliances composed of scientists, practitioners and policy-makers focusing on evidence-based solutions: Transformative Partnership Platforms (TPPs) and Engagement Landscapes. To name but three, the Nature-Based Drawdown TPP is a 'go to' platform for selection, design and implementation, leveraging projects operating in Indonesia, Gambia, Rwanda and various regions. The [Bioeconomy Solutions TPP](#) is using data, forecasts and other science to develop a bioeconomy strategy for decisions on land use, materials, food, consumption, diets and energy. The Greening Forest and Tree Product Value Chains TPP is developing business and investment cases for improving environmental and social performance of forest- and tree-product value chains in the Global South and selected countries in the Global North. We will deploy and assess pilot cases and engage with committed public and private investors to leverage responsible finance. We invite collaborations with progressive companies, governments and likeminded NGOs.

ABOUT CIFOR-ICRAF

CIFOR-ICRAF delivers evidence and solutions to transform how land and renewable resources are used and food is produced. Through our collaborative, action-oriented approach, we help conserve and restore ecosystems, support sustainable supply chains and respond to accelerating climate change, malnutrition, biodiversity loss and desertification. In short, we improve people's lives while preserving the environment.

Our track record



+2000

projects completed in **92** countries



193

active partnerships to develop and implement transformative solutions



Developed more than

25,000

publications and knowledge products easily accessible online



More than

200,000

people from **185** countries have participated in the Global Landscapes Forums events, workshops and learning opportunities

CIFOR-ICRAF

The Center for International Forestry Research (CIFOR) and World Agroforestry (ICRAF) envision a more equitable world where trees in all landscapes, from drylands to the humid tropics, enhance the environment and well-being for all. CIFOR and ICRAF are CGIAR Research Centers.

