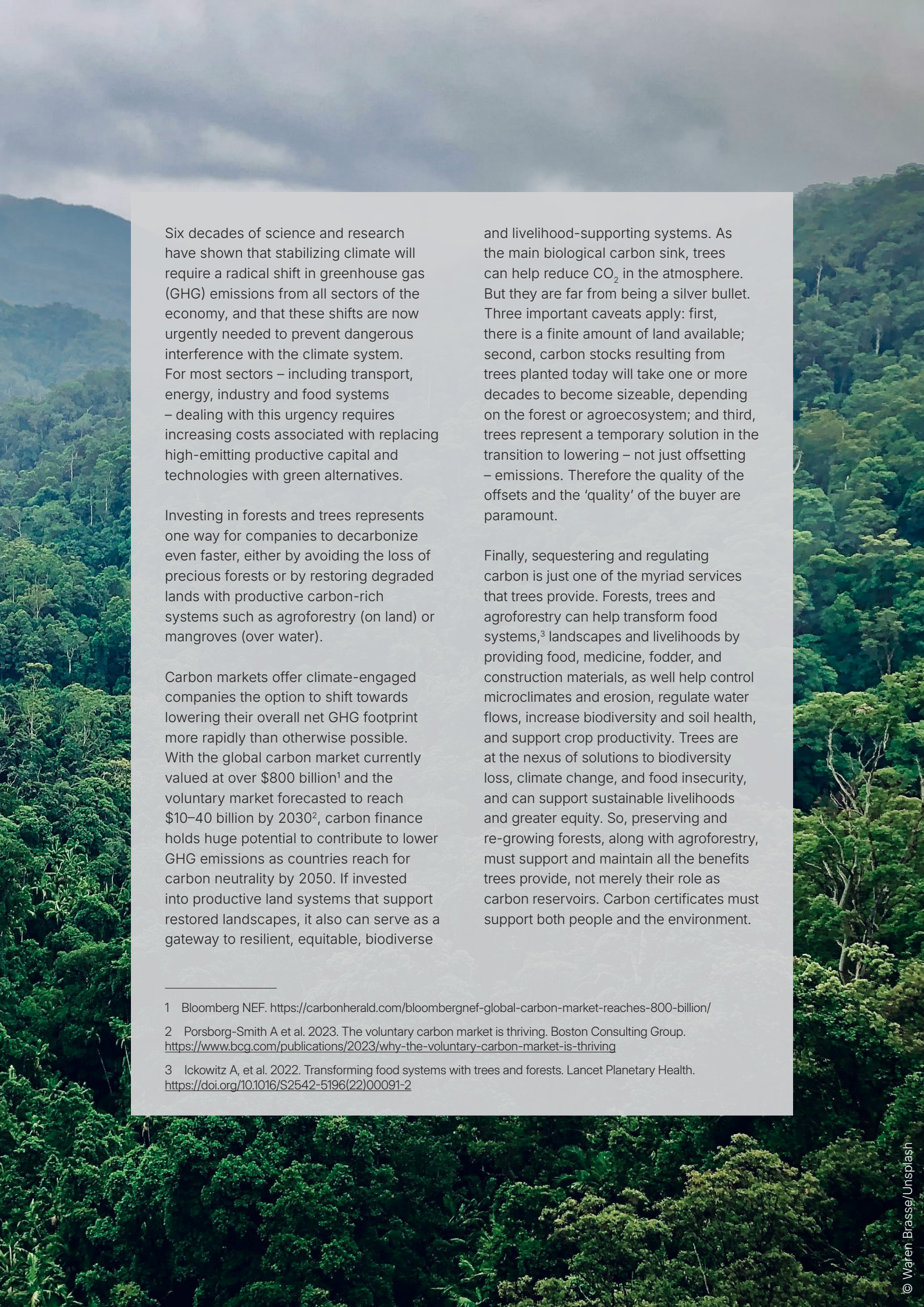
CIFOR-ICRAF and Carbon Markets

How to harness the world's best green technology: Trees



Six decades of science and research have shown that stabilizing climate will require a radical shift in greenhouse gas (GHG) emissions from all sectors of the economy, and that these shifts are now urgently needed to prevent dangerous interference with the climate system. For most sectors – including transport, energy, industry and food systems – dealing with this urgency requires increasing costs associated with replacing high-emitting productive capital and technologies with green alternatives.

Investing in forests and trees represents one way for companies to decarbonize even faster, either by avoiding the loss of precious forests or by restoring degraded lands with productive carbon-rich systems such as agroforestry (on land) or mangroves (over water).

Carbon markets offer climate-engaged companies the option to shift towards lowering their overall net GHG footprint more rapidly than otherwise possible. With the global carbon market currently valued at over $800 billion[1] and the voluntary market forecasted to reach $10–40 billion by 2030[2], carbon finance holds huge potential to contribute to lower GHG emissions as countries reach for carbon neutrality by 2050. If invested into productive land systems that support restored landscapes, it also can serve as a gateway to resilient, equitable, biodiverse and livelihood-supporting systems. As the main biological carbon sink, trees can help reduce CO_2 in the atmosphere. But they are far from being a silver bullet. Three important caveats apply: first, there is a finite amount of land available; second, carbon stocks resulting from trees planted today will take one or more decades to become sizeable, depending on the forest or agroecosystem; and third, trees represent a temporary solution in the transition to lowering – not just offsetting – emissions. Therefore the quality of the offsets and the 'quality' of the buyer are paramount.

Finally, sequestering and regulating carbon is just one of the myriad services that trees provide. Forests, trees and agroforestry can help transform food systems,[3] landscapes and livelihoods by providing food, medicine, fodder, and construction materials, as well help control microclimates and erosion, regulate water flows, increase biodiversity and soil health, and support crop productivity. Trees are at the nexus of solutions to biodiversity loss, climate change, and food insecurity, and can support sustainable livelihoods and greater equity. So, preserving and re-growing forests, along with agroforestry, must support and maintain all the benefits trees provide, not merely their role as carbon reservoirs. Carbon certificates must support both people and the environment.

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1 Bloomberg NEF. https://carbonherald.com/bloombergnef-global-carbon-market-reaches-800-billion/

2 Porsborg-Smith A et al. 2023. The voluntary carbon market is thriving. Boston Consulting Group. https://www.bcg.com/publications/2023/why-the-voluntary-carbon-market-is-thriving

3 Ickowitz A, et al. 2022. Transforming food systems with trees and forests. Lancet Planetary Health. https://doi.org/10.1016/S2542-5196(22)00091-2

Our background

The Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF) has over four decades of research on these issues. CIFOR-ICRAF is ready to support companies willing to engage in net zero and to use carbon markets to accelerate their transition. This includes companies from any sector, but particularly from the land use sector: food, agriculture and forestry. In doing so, our focus remains first and foremost on the improvement of livelihoods and landscapes through forests, trees and agroforestry.

How can we help? We bring to the table a wealth of expertise in the right land carbon projects – from forest conservation to productive restoration – at the right place for the right purposes, with the right safeguards and benefits for all.

This includes experience in carbon financing, carbon project design, stakeholder consultation, policy alignment, carbon accounting methodology, landscape risk management, carbon project execution, carbon project monitoring, and non-carbon impact monitoring.

These activities are grounded in our science, and we hold deep expertise in measurement, reporting and verification (MRV) of carbon stocks in forest and wetland landscapes, sustainable forest management; afforestation and reforestation; agroecological approaches including agroforestry; reducing emissions from deforestation and forest degradation (REDD+); development of sustainable value chains (charcoal and improved cookstoves); integration of gender and equity issues into project design; jurisdictional approaches to REDD+ and low-emissions development; and access and benefit-sharing. We provide technical and policy support to governments at all scales, and our research has informed national climate policies in countries from Peru to Ethiopia to Vietnam. On the ground, our extensive partnership networks are generating solutions to meet evolving local and global needs.

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Three principles for CIFOR-ICRAF's engagement with carbon markets

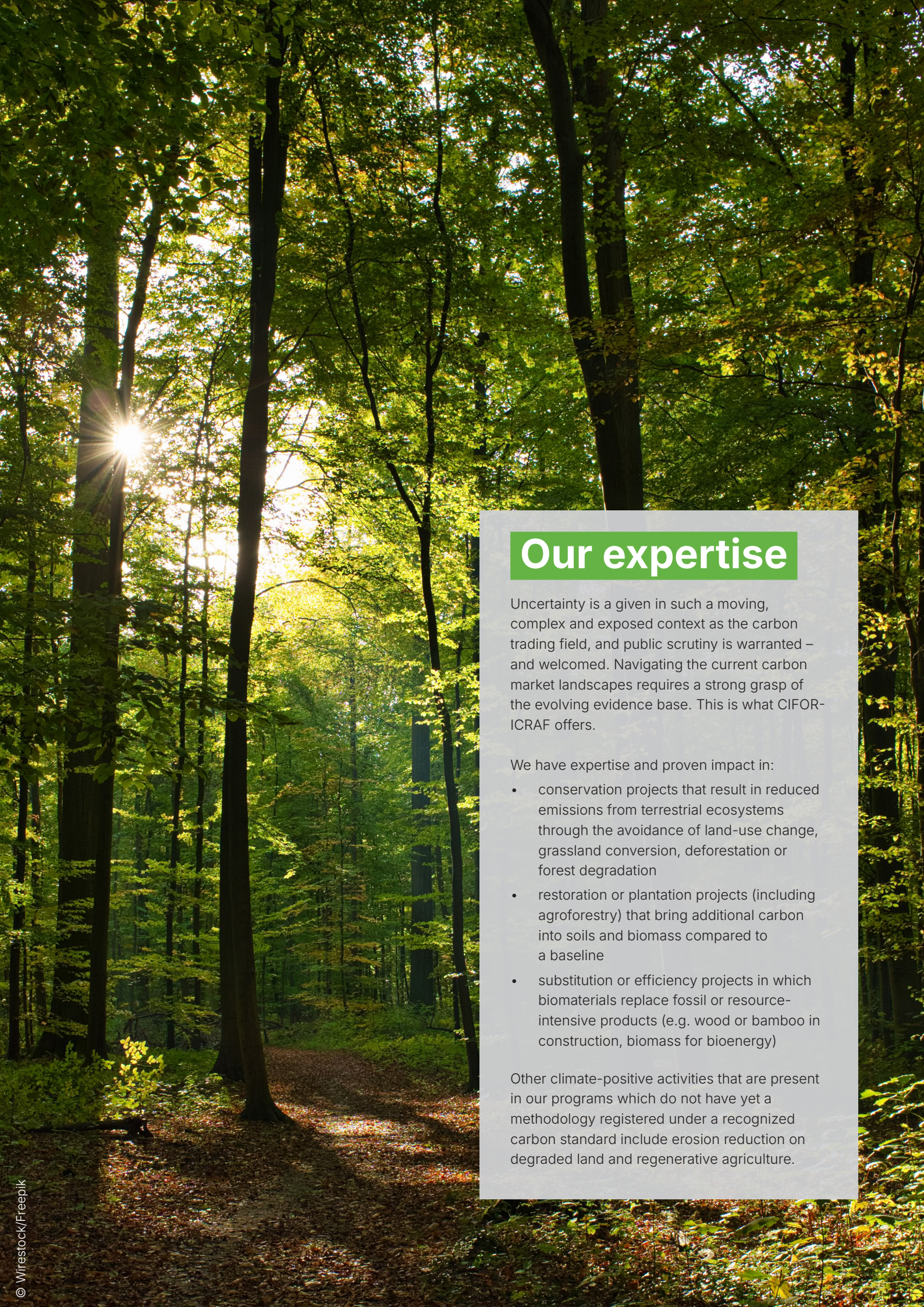
CIFOR-ICRAF neither promotes nor criticizes carbon markets. We see them as a key instrument towards accelerated net zero, knowing this transition will not happen solely because of carbon markets but can only be facilitated by them. Our view is that carbon markets hold great value and potential, provided they aim at high quality. We apply to ourselves the following principles when we help stakeholders, including the private sector, in engaging with carbon markets:

1. **Carbon credits should not be a 'right to pollute'**. Forests trees and agroforestry play a critical role in regulating the global carbon cycle and climate change mitigation. Land-use offsets derived from forests, trees and agroforestry provided to other sectors as partial compensation for their emissions should be a way to accompany proactive businesses and production systems (energy, transport, housing, food and agriculture sectors) in their necessary transition to lower emissions. They should provide a bridge towards a net zero future – not simply a way to continue business as usual.

2. **We aim at demonstrated, locally owned, high environmental integrity.** Methods, approaches, and calculations for environmental benefits must be science-based, and proposed solutions must be locally owned. Projects must deliver carbon and GHG results that are demonstrated, quantified and traced by the best science available. Environmental integrity, including biodiversity impacts and high biodiversity contribution on top of carbon benefits, are paramount. Projects also need to be fully endorsed by local and project stakeholders. In this context, carbon standards serve as a backstop, not an ambition: the ambition is local ownership. Activities must be designed to address challenges identified by local populations, provide solutions relevant to the project context, and yield transformative effects for local communities throughout the project and beyond its lifetime.

3. **Risk-sharing must play in favour of low-income or vulnerable groups** that need to benefit from any carbon project. Our projects should first and foremost support and accompany enhanced livelihoods plans for smallholder farmers, forests, local communities, and the state of their immediate environment. We should ensure risks do not weigh heavily on smallholders, who undertake operational and productive risks on the ground in order to change practices (whereas investors only see risks on a spreadsheet). At the very least, smallholders need to be protected from any deterioration of their livelihoods, voice, or sense of place. Project design must include consideration for transparent and fair governance that specifies Free Prior and Informed Consent (FPIC), social and environmental safeguards, considerations of land use and land ownership, and local inequities. When value is created, its distribution must be fair.

To ensure adherence to these three principles, due diligence and transparency in all processes related to carbon markets are paramount. In our direct partnerships and throughout all project activities, we ensure clarity and traceability on the nature of our roles and responsibilities with partners. CIFOR-ICRAF maintains independence and uses only unbiased scientific evidence, tools, analysis and advice for efficient and equitable outcomes for forests, people and nature.



Our expertise

Uncertainty is a given in such a moving, complex and exposed context as the carbon trading field, and public scrutiny is warranted – and welcomed. Navigating the current carbon market landscapes requires a strong grasp of the evolving evidence base. This is what CIFOR-ICRAF offers.

We have expertise and proven impact in:

- conservation projects that result in reduced emissions from terrestrial ecosystems through the avoidance of land-use change, grassland conversion, deforestation or forest degradation
- restoration or plantation projects (including agroforestry) that bring additional carbon into soils and biomass compared to a baseline
- substitution or efficiency projects in which biomaterials replace fossil or resource-intensive products (e.g. wood or bamboo in construction, biomass for bioenergy)

Other climate-positive activities that are present in our programs which do not have yet a methodology registered under a recognized carbon standard include erosion reduction on degraded land and regenerative agriculture.

Examples of our carbon-related work include:

REDD+

Despite the number of projects worldwide aimed at reducing emissions from deforestation and forest degradation, and enhancement of forest carbon stocks (REDD+), clear evidence on their effectiveness is hard to come by. The largest global research programme of its kind, our Global Comparative Study on REDD+ (GCS REDD+) has been collecting data, sharing experiences and analysing research to determine what has worked and what hasn't with REDD+ across 22 countries. Building on 27 years of science aimed at understanding the causes of deforestation and forest degradation – and what can be done to stop it while also securing the rights and livelihoods of Indigenous Peoples and local communities – GCS REDD+ is filling information gaps on carbon certification, sources of financing, benefit-sharing mechanisms, and community-level interventions.

Wetlands and blue carbon

CIFOR-ICRAF expertise on wetland ecosystems, which include peatlands and mangroves, runs deep. In 2013, five CIFOR scientists were among the lead and coordinating authors of the Intergovernmental Panel on Climate Change (IPCC) Wetlands Supplement. Results from our Sustainable Wetlands Adaptation and Mitigation Program (SWAMP) demonstrated that carbon stocks in these ecosystems are among the highest of any wetland or forest, and thus forest and land cover change in these ecosystems results in significant emissions of GHG. SWAMP is providing critical information on tropical wetland ecosystem values, including how to more effectively conserve and restore them, and is increasing awareness of the tremendous potential role these ecosystems can play in climate change mitigation and adaptation. The new Blue Carbon Deck, a Transformative Partnership Platform (TPP) launched during COP28, is designed to bring together the multiple initiatives that are exploring the exciting potential of blue carbon as a game-changer for meeting emissions targets.

Transparent Monitoring

The Paris Agreement stresses the importance of the land use sector and many countries have included land use sector targets in their Nationally Determined Contributions (NDCs). They will need to account for emissions and removals from the sector in a manner that promotes transparency, accuracy, completeness, comparability and consistency. Transparent Monitoring can help developing countries improve monitoring of land use emissions and better assess mitigation actions. Transparent Monitoring approaches are datasets, tools and portals that support countries' needs, such as in the land use sector, by providing complementary data to what is mandated by their own monitoring systems. The project is developing guidance on how to implement open-source tools and open-access datasets as well as how to improve data access in four countries: Côte d'Ivoire, Ethiopia, Papua New Guinea and Peru.

Woodfuel value chains

Woodfuel is the main source of energy for cooking for over 60% of households in Sub-Saharan Africa, contributing to the food security and nutritional needs of millions of people. Our research on woodfuel value chains in Cameroon, the Democratic Republic of the Congo (DRC), Kenya and Zambia has provided knowledge and options on ways to create more sustainable woodfuel value chains. We also have over 15 years of on-the-ground experience in DRC's Tshopo Province, where the Yangambi Biosphere Reserve is under intense pressure from deforestation. In the Yangambi Engagement Landscape, over 3 million trees have been planted since 2019, restoring over 3,500 hectares of land and creating several thousand seasonal and direct jobs. Sustainable livelihood efforts are focusing on development of small-to-medium enterprises, including support for associations of charcoal producers and improved cookstove businesses. Efforts to integrate agroforestry with charcoal production have resulted in both increased food crop production and reforestation, as well as the establishment of producer-led local associations and greater collaboration between communities and local authorities.

Circular bioeconomy

Leveraging multi-sector collaboration for creating bioeconomy solutions represents an 'overlooked' pathway to reduce greenhouse gas emissions, conserve biodiversity, and create equitable jobs and prosperity at global scale. The Transformative Partnership Platform on Bioeconomy Solutions brings together key stakeholders from public and private sectors and civil society to achieve such transformational change.

Restoration

By sharing lessons, principles and insights, the Landscape Restoration Transformative Partnership Platform is catalysing rapid learning and the transformative development of forest, agricultural and pastoral production systems. This partnership engages with people and results-oriented practices on the ground to produce actionable evidence, linked to practice and policy, that can shift current trajectories and deliver positive outcomes.

The Regreening Africa programme – recently named as one of seven UN World Restoration Flagships by the UN Decade on Ecosystem Restoration – is an ambitious effort to improve livelihoods, food security and climate resilience among smallholder farmers by restoring ecosystem services through agroforestry in Ethiopia, Ghana, Kenya, Mali, Niger, Rwanda, Senegal and Somalia. The initiative, which put 350,000 hectares under restoration in eight sub-Saharan African countries between 2017 and 2023, aims to restore five million hectares by 2030 with additional investment, using a community-centred and research-based agroforestry and sustainable land management approach. Developed by our Geospatial Unit, the Regreening Africa App engages farmers and implementors to track restoration practices on the ground through assisted citizen science data collection.

Ethiopia's green growth strategy includes a commitment to restore more than 20 million hectares of degraded forest landscapes within the next 20 years – one of the world's most ambitious forest landscape restoration programmes. The Provision of Adequate Tree Seed Portfolio in Ethiopia (PATSPO) project supported the national government through the provision of high-quality tree seeds of priority species for large-scale restoration plantings, strengthened existing tree-seed organizations and supported the establishment of additional private and government seed dealers, and a critical mass of tree genetic resources for the future, along with capacity development to monitor and deliver quality seeds and seedlings of the species required for large-scale restoration.

Soil and land health

With over one third of the Earth's surface degraded and over 3.2 billion people negatively affected by degradation, it is clear that we cannot achieve food systems transformation without healthy, well-functioning soil. CIFOR-ICRAF is a global centre of excellence for soil and land restoration, integrated soil information, and soil organic carbon accounting, with relevance for food and nutrition security, national restoration goals and climate commitments. Through our state-of-the-art Soil-Plant Spectral Diagnostics Lab and Living Soils Laboratory, and as co-leader the Coalition of Action 4 Soil Health (CA4SH), we are ensuring actionable evidence directly informs global soil agendas and ecosystem health investments.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Policy and technical support

Through the above-mentioned initiatives and other work, CIFOR-ICRAF has contributed evidence, knowledge and analysis to inform policies and practices across Africa, Asia and Latin America. These include:

- **Peru**: Forest Reference Emissions Level (FREL), National Strategy for the Restoration of Ecosystems and Degraded Forest Lands, legislation on restoration through tree plantations (2017), and technical norms for multiple forest use in Brazil nut concessions (2016)
- **Guatemala**: revision of norms for granting forest concessions in the Maya Biosphere Reserve
- **Kenya**: National Landscape and Ecosystem Restoration Strategy including co- leading the agroforestry component towards restoring 10.6 million hectares of degraded landscapes and attaining 30% tree cover by 2032; Forest and Landscape Restoration Implementation Plan (FOLAREP) 2023–2027; Kenya Climate Smart Agriculture Strategy 2017–2026; Bioenergy Strategy (2020–2027); Forestry and agriculture greenhouse analyses to support the mitigation sub-component of the National Climate Change Action (NCCAP) plan 2018–2022; and several other national and county-level climate and restoration processes
- **Ethiopia**: National Forest Law (2018), National Forest Policy and Strategy
- **Indonesia**: Forest Reference Emissions Level (FREL), Strategic Coordination Team for Wetlands Management, national action plan for sustainable oil palm (2019), Grand Design for Fire Prevention (2017) and related subnational policies
- **Philippines**: National Development Plan to ensure ecological integrity through the Scaling up of the adoption of sustainable land management (2021)
- **India**: National Agroforestry Policy (2019)
- **Nepal**: Nepal National Agroforestry Policy (2019)
- **Vietnam**: Nationally Determined Contribution (NDC) (2020), Law on Forestry (2017), Forest Sector Development Strategy for the period of 2021–2030, vision to 2050 (2020), and Provincial Green Growth Action plan for Lam Dong province

CIFOR-ICRAF

The Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF) harnesses the power of trees, forests and agroforestry landscapes to address the most pressing global challenges of our time – biodiversity loss, climate change, food security, livelihoods and inequity. CIFOR and ICRAF are CGIAR Research Centers.

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