



RESEARCH
PROGRAM ON
Forests, Trees and
Agroforestry

Forests, Trees and Agroforestry

Livelihoods, Landscapes and Governance



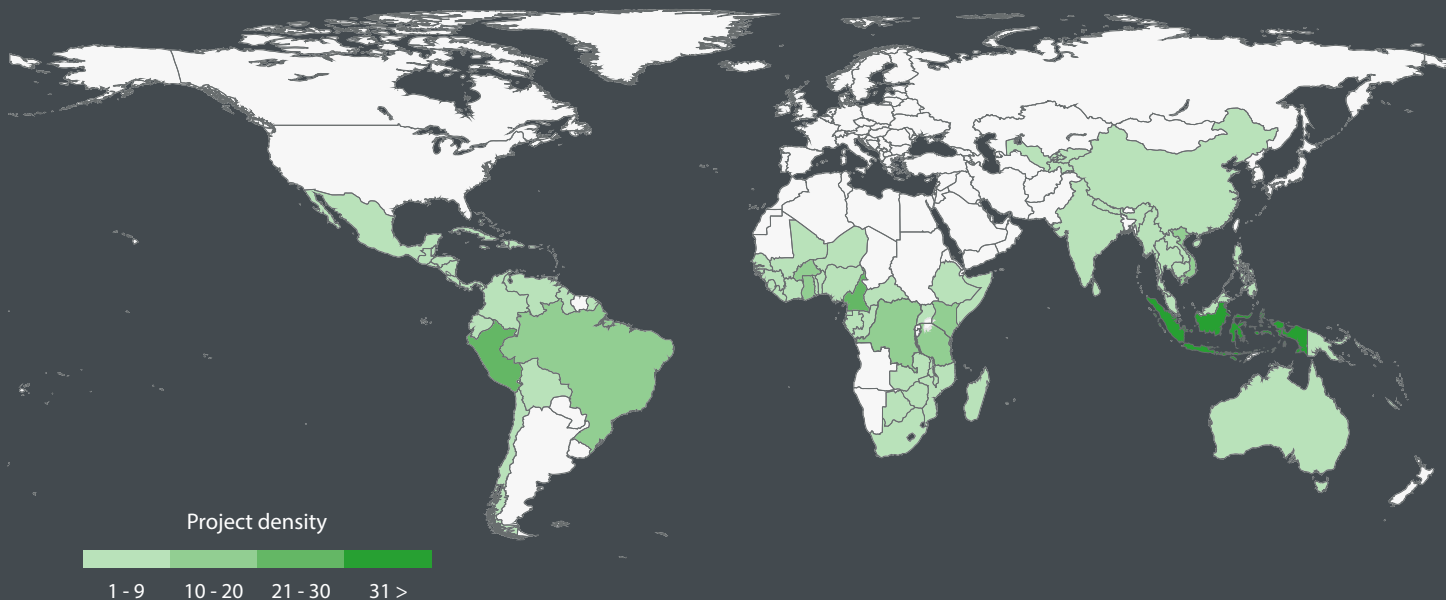


Introduction

With over 230 researchers working in more than 80 countries across Asia, Africa and Latin America, the CGIAR Research Program on Forests, Trees and Agroforestry (FTA) responds to the urgent need for a strong and sustained research focus on the management of forests and trees. Trees on farms and in forests play a crucial role in confronting some of the most important challenges of our time: reducing poverty, improving food security and nutrition, and protecting our environment. They are also important in sustaining ecosystem services like clean water and biodiversity conservation.

Spanning scales from farms to landscapes, FTA research ranges from genomics to governance and involves novel partnerships with national governments, civil society and the private sector. FTA is built around five flagship research programs supported by five integrated themes, and produces an ever-increasing number of high-quality scientific products. Over 3 years, FTA has produced more than 2000 publications, including 770 articles in journals with high impact factors and more than 1300 open access papers. One third of our publications are written by authors from developing countries.

FTA projects worldwide



One of FTA's comparative advantages is a dense network of centers working closely with local partners. Research includes more than 300 projects in over 80 countries across the tropical belt. The top countries are Indonesia with 34 projects, Peru with 26, Cameroon with 22, Burkina Faso with 17, Tanzania with 14, Vietnam with 13, and Kenya and the Democratic Republic of Congo (DRC) with 12 each.





Flagship programs

1

Livelihood systems

Around the world, trees contribute to the food security and income of millions of smallholders. Flagship 1 seeks to increase that contribution by improving tree genetic resources, creating better market access and removing barriers to people benefiting from natural resources – especially women and young people. Research on tree management options, value chains for forest and tree products and extension methods is combined with work on policy and institutions to ensure impact at scale. We have a focus on the household level and novel methods to make our work sensitive to local nuances, driving local adaptation of interventions to foster widespread adoption.

Policy change improves income for farmers in Peru

For Peruvian smallholders, timber from naturally regenerated trees in fallows is a potential income source. But forest laws make cutting and selling the wood expensive and complicated. FTA research has led to a change in the legal definition of agroforestry in Peru. This new definition allows 450,000 smallholders to sell timber legally from their fallow plots, thereby increasing their income and eliminating risk of prosecution. This affects the livelihoods of over two million people and a land area of over 4.5 million ha of the Peruvian Amazon.

Regenerating trees boost crop yields and farm income across the Sahel

A widespread increase in tree cover across the Sahel has been driven by farmers encouraging natural regeneration (FMNR). The practice has spread over 5 million ha, impacting 2.5 million people in southern Niger alone, and FTA research has provided the first robust evidence of its benefits. Through surveys across four countries: Burkina Faso, Mali, Niger and Senegal, we found that trees increased food crop yield by 15-30%, depending on location, tree species and crop type. We also found that trees were a source of significant household income (typically \$200 per household per year) despite only 10-25% of harvested products being sold. Crop yields and household incomes were higher for those practicing FMNR, and were positively correlated with tree maturity and density. The research suggests that in many places, nature needs a hand for trees to improve human livelihoods. In response, in a shared platform with Dryland Systems, FTA is combining local knowledge and high-end science to develop appropriate tree planting material to enrich naturally growing trees and consequently, benefit households.

Tree diversity improves resilience in Eastern DRC

Restoring tree cover in post-conflict Eastern DRC is fundamental to addressing land degradation, food security and poverty. Single species woodlots have been promoted as a 'silver bullet' solution, but these are vulnerable, only adoptable by certain people and have low environmental value. In partnership with WWF, FTA scientists developed a framework and tools for identifying and evaluating tree planting and management options for specific people and contexts. As a result, development partners are now promoting over 50 tree species with different options to suit different groups of people, especially women, in the buffer zone around Virunga national park. This builds on success in the Lake Tanganyika catchment where 2 million trees, including 16 native species, were raised and planted by farmers in productive and environmentally protective niches in 2012. These trees are now contributing to the resilience of livelihoods and landscapes around the lake and reducing sedimentation. Several years after the project has ended, farmers are still raising native trees in their nurseries.

"FTA has opened our eyes to new tree planting options – we need to adapt our approach."



Hicham Daoudi
WWF, EcoMakala project manager, Goma, DRC

A photograph of a man in a brown t-shirt and a cap, sitting in a forest. He is surrounded by large, freshly cut tree stumps. The forest floor is covered with green vegetation and fallen leaves. The background shows more trees and foliage.

2

Management and conservation of forest and tree resources

Forest resources are becoming increasingly scarce and, for many rural people, more difficult to access. Increasing and improving the production and availability of these resources is a key step in addressing the world's greatest challenges – food security, poverty and climate change. To tackle the issue, Flagship 2 research focuses on diversified forest management, conservation and use of tree genetic resources, and forest restoration. We prioritize species and populations and forests and woodlands of value to people, concentrating on the FTA sentinel landscapes as co-location sites. Our work aims to move the world toward more equitable management of forests and woodlands, and better use and conservation of biodiversity resources.

Bringing biological diversity to the world's attention

FTA research and recommendations are featured in FAO's first report on the *State of the World's Forest Genetic Resources* and its *Global Plan of Action for Forest Genetic Resources*. The reports and a series of worldwide workshops that our scientists attended as expert advisors led to a call at the Convention on Biological Diversity's 2014 COP for "due attention to both native species and genetic diversity in conservation and restoration activities."

Helping to avoid 30 million tons of emissions in Brazil

FTA research showed that large areas of forest in Brazil nut concessions are being cleared for farming and mining, thus putting livelihoods and forests at risk. The research covered around 2 million ha of Brazil's nut-rich forests, among which there are up to 100,000 ha of "conflict lands" that were at a very high risk of being cleared for agriculture. Given the terra firme forest in the area, this represents about 300 tons of carbon per ha, and with those 100,000 ha less at risk, the work contributed to about 30 million tons of avoided emissions.

Observing the impact of logging on some 6 million trees

The Tropical managed Forests Observatory (TmFO) is a pan-tropical network investigating the long-term effects of logging on tropical forest ecosystems, specifically in terms of biomass dynamics and changes in species composition over time. TmFO encompasses 493 permanent forest plots representing an area of more than 1000 ha and 6 million trees across the Amazon and Congo basins and Southeast Asia. The results are expected to provide key insights about forest responses to logging at plot, forest and regional scales, ultimately contributing to more sustainable and profitable tropical forest management.

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Conservation of and better access to cacao diversity

Cacao genetic diversity is essential to developing more sustainable and productive cacao varieties in the future, yet is decreasing at an alarming rate. FTA coordinates CacaoNet, a global network that aims to tackle the issue and optimize the conservation and use of cacao genetic resources. CacaoNet has mobilized partners from the public and private sectors in international consultations on *ex situ* and on-farm approaches to securing the genepool; and coordinated the revision of the *Technical Guidelines for the Safe-Movement of Cacao Germplasm* with the International Cocoa Quarantine Centre UK; provided global platforms – which increasing numbers of countries are participating in each year – for identifying, promoting and rewarding diversity of cocoa origins and flavors in partnership with the Cocoa of Excellence Programme.

3

Landscape management for environmental services, biodiversity conservation and livelihoods

Landscapes are dynamic systems where human and ecological processes interact. This often involves trading off longer-term interests in environmental services and immediate livelihood needs. Yet a recent synthesis of experience and literature on the multiple functions of landscapes concluded that there is scope to nudge these complex systems towards better and more integrated strategies for management. Flagship 3 analyzes the patterns and drivers of tree cover change; the consequences of these changes for water cycling, biodiversity, nutritional diversity and food security; and the ways governance regimes can provide options to better manage the tradeoffs. Ultimately we aim to improve integrated landscape management to conserve our natural resources without compromising rural livelihoods or wider societal goals.



Research informing global thought

FTA research on the importance of working across landscapes instead of in sectoral silos has been at the forefront of global discussion and literature. Our work and scientists have featured in:

- a synthesis by the European Tropical Forestry Advisory Group
- a European Tropical Forest Research Network issue on productive landscapes
- a Landscapes for People, Food and Nature synthesis on landscape governance
- the Global Landscapes Forum in Lima
- a new book: *Climate-Smart Landscapes; Multifunctionality in practice*.
- contribution to the IUFRO Global Forest Expert Panel on “Forests, trees and landscapes for food security and nutrition: a global assessment report”
- a systematic map on integrated landscape approaches.

Recognized as experts in learning landscapes

Long-term FTA involvement in the RUPES project – a study aimed at learning the best ways of conserving ecosystems while improving local communities’ livelihoods – has seen FTA recognized as an expert in the field. As such, Indonesia’s new Minister of Environment and Forestry sought advice from FTA researchers on how to redesign and integrate existing laws and regulations on economic incentives for environmental services.

Global recognition of forests for food security

FTA research has helped put the spotlight on forests and trees as vital in contributing to the attainment of global food security and improved nutrition. With research leading to a global call for greater attention to integrating forests and trees at the landscape scale into food security and nutrition strategies, international policy makers are ready to take action. And new FTA research is stepping up to meet their knowledge needs based on compelling data-driven evidence.



4

Climate change adaptation and mitigation

As climate change continues to impact lives and the resources the world depends on, the urgency for efficient, effective and equitable action has increased. Flagship 4 investigates how forest management and land use can reduce (mitigate) greenhouse gas emissions and how forests and forest-dependent people can adapt to climate change. We are carrying out a global comparative study of the REDD+ policy mechanism and looking into developing land-use planning tools and carbon accounting systems for climate mitigation and adaptation. We are also incorporating climate mitigation and the multiple ecosystem service provisions of a landscape into the development of landscape approaches to Low Emissions Development Policies. On the road to the 2015 Paris Climate Conference and beyond, we are stepping up efforts to provide knowledge, tools and policy advice for the formulation of international, national and subnational policy responses to climate change.

Informing international and national climate change strategies

FTA research helps in designing climate change and resource management policies around the world, and FTA scientists are being called on for their expertise. FTA work has informed UNFCCC decisions (e.g. the stepwise approach on measuring forests and carbon) and the IPCC (e.g. the emission factors used in the guidelines for carbon in wetlands), and our comparative policy analysis of synergies between adaptation and mitigation policies is informing the UNFCCC's Adaptation Board. The Common Market for Eastern and Southern Africa (COMESA), the African Union and the African Progress Panel have all relied on FTA research to inform their climate work.

In Indonesia, FTA scientists are helping to develop the country's National REDD+ Strategy and set its forest reference emissions level. The scientists are collaborating with Indonesian authorities on a national carbon accounting system. LUWES, a land-use planning tool for low emission development strategies that helps planning for emissions reductions at the landscape scale, is used by 30 of the 33 provinces of Indonesia. The Ethiopian REDD+ taskforce has used FTA research to develop a national roadmap for monitoring, reporting and verification of carbon.

Terra-i, an open data access system developed by FTA researchers, detects vegetation changes from human activities in Latin America in near real-time. Terra-i also supplies Global Forest Watch with regionally verified data. FTA has partnered with Peru's Ministry of Environment to implement Terra-i as an early warning system for land-cover change.

These efforts help pave the way for climate policies related to forest management and conservation. Building policy consensus reduces friction in multi-level policy implementation and helps with efficient and cost-effective implementation of climate mitigation and adaptation policies and activities.

According to a paper by Kindermann et al. (2008 *PNAS* 105:10302–10307), the range of costs needed to achieve a 10% reduction in deforestation over 30 years is between USD 12 billion and 51 billion. The expected investment in Flagship 4 over five years (2012–2016) is USD 0.1146 billion, corresponding to just 1.0% and 0.2% of the lower and upper ends of the range. This puts Flagship 4 into perspective, even if no real “value for money” can be identified at this stage, because climate policies are still in the making.

FTA work has informed UNFCCC decisions and the IPCC, and our comparative policy analysis of synergies between adaptation and mitigation policies is informing the UNFCCC's Adaptation Board.



5

Global governance, trade and investment

Expanding trade and investment in global and domestic markets is driving production trends and so changing how land is used and how people's livelihoods are affected. Proposing solutions to reduce the negative impacts and enhance the positive impacts from trade and investment on forests and people demands understanding the dynamic forces at play across multiple scales. Flagship 5 research aims to do that. We investigate the forces that shape trade and investment dynamics, and the subsequent impacts on forests and livelihoods. We use that knowledge to support effective governance processes at regional, national and global levels to shape and manage impacts. By doing so, our work contributes toward more sustainable and equitable development in forest-rich countries.

Social impacts of forest management certification

In the Congo Basin, FTA research showed that the Forest Stewardship Council (FSC) voluntary certification scheme – which ensures timber production meets higher standards than those requested by national regulations – improved living and working conditions in commercial forest use. The results have received significant attention and have been delivered around the world, with international organizations such as FSC and WWF using the data to improve current standards and support FSC campaigns.

Supporting sustainable oil palm and smallholder livelihoods

Building on a long history of research in the oil palm sector, FTA researchers are assessing the dynamics shaping oil palm development and their impacts. FTA research, for example, has helped to identify the strengths and weaknesses of the oil palm sector in Cameroon, including the overlooked potential contribution of smallholders to the industry. Now, in collaboration with WWF, FTA scientists are working with Cameroon's Ministry of Agriculture and Rural Development to draft a sustainable strategy for oil palm that develops the role of smallholders. We are also assessing options for more sustainable oil palm supply in Indonesia, and understanding the dynamics and impacts of oil palm expansion in Latin America.

FTA scientists are working with Cameroon's Ministry of Agriculture and Rural Development to draft a sustainable strategy for oil palm that develops the role of smallholders.

Improved policies for the small-scale domestic timber sector

FTA research revealed major challenges facing smallholders and small-scale chainsaw millers in Central Africa and Indonesia in the context of FLEGT-VPA implementation. We placed our attention on the challenges that the timber sector face in meeting its obligations under the Voluntary Partnership Agreement – a mechanism to ensure that timber is harvested and exported legally to EU timber markets. Our recommendations have been reported to governments, civil society actors and producer organizations. In Indonesia, the Ministry of Forestry made policy changes to accommodate local industry, and the Berau District government requested input from FTA researchers on their local policy.

Cross-cutting themes



Gender

Gender roles – the socially defined responsibilities and behaviors considered appropriate for women and men – vary at every level, from governments to individual households. The Gender theme integrates this perspective across all FTA flagships to ensure that the different capacities, knowledge, preferences and priorities of women and men are reflected across the research cycle. We identify and address the different effects of policies, technologies and practices on men and women to enhance gender and social equity, and identify opportunities for improving forest management.

We integrate gender through:

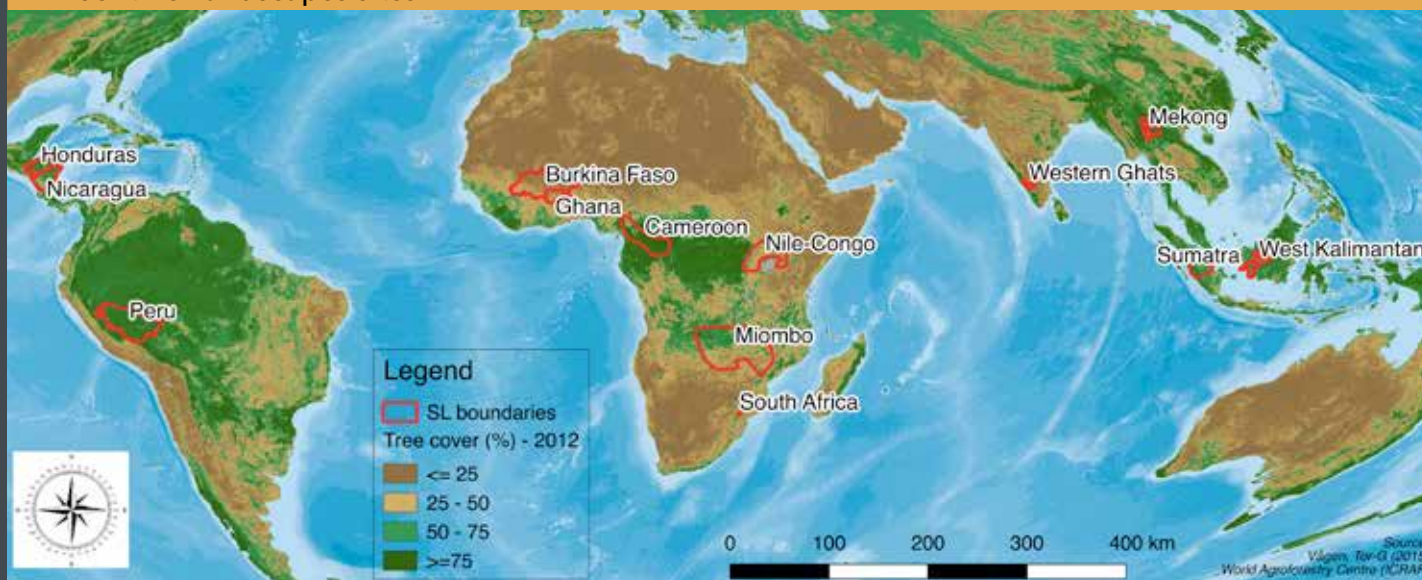
- capacity development of scientists and partners in gender concepts, frameworks and methods
- strategic gender research across flagships and CGIAR research programs
- targeted support for gender analysis across flagships
- monitoring and evaluation of gender integration
- knowledge sharing across themes.



Achievements

- 180 scientists in headquarters and field-based locations trained in gender concepts and research methods
- 20 tools and guidelines for gender analysis and research methods
- Two case studies in the CGIAR global study on gender norms in agricultural and NRM innovation (Indonesia, Kyrgyzstan)
- Gender Equality in Research Scale (GEIRS), a tool to assess gender integration in research
- Guide for community-based self-monitoring and evaluation
- Volume on Gender and forestry (12 chapters on participation, climate change, value chains, tenure and emerging issues)
- Special journal issue on gender and agroforestry
- Community of practice on gender-responsive agrobiodiversity research
- 41% of FTA researchers are women and we are aiming at reaching parity by end of 2016
- A Gender Research Fellowship program of 18 months provided five young scientists from around the world with training on participatory research methods to strengthen the gender dimensions of five ongoing FTA projects; they were supported by gender experts while developing their own capacity to carry out gender research
- Field guide illustrating the use of Adaptive Collaborative Management (ACM), a collective problem-solving and management approach to facilitate gender-equitable negotiation and encourage the broader participation of women in decision making in forest management
- Innovative approaches, including agent-based models and role-playing games applied to study gendered behavior in land-use decisions and gendered dynamics that shape the multi-functionality of landscapes

Sentinel landscapes sites



Learn more: cifor.org/sentinel-landscapes

Sentinel landscapes

As one of the most innovative approaches within the Consortium Research Programs portfolio, FTA has initiated a unique, massive - and massively ambitious - research initiative, spanning nine landscapes across 20 countries on three continents. It involves scores of scientists and practitioners from 60 organizations, and employs a range of research methods from household surveys to soil sampling, from vegetation inventories to satellite imagery. The objectives are to set the stage for comparative analysis across diverse landscapes and to publish a consistent metadata set that allows researchers and stakeholders to identify both environmental and institutional factors that enable farmers to benefit from the products and ecosystem services that trees and forests provide.

At the global scale, the data generated feed into global analyses across a diverse range of networks, including both humid and dryland ecosystems, to support the international

environmental conventions. This includes supporting developing countries in their efforts to develop climate change mitigation and adaptation policies, and to measure their progress towards achieving the SDGs.

The network is currently working in South Africa, Uganda and Rwanda, Nicaragua and Honduras, Western Ghats (India), the Mekong (China, Laos), Ghana-Burkina Faso, Western Amazon (Brazil, Peru, Bolivia), Borneo-Sumatra (Indonesia), and Cameroon.

Within each of our sentinel landscapes, we have emphasized building and nurturing a network of committed research and civil society partners, with the objective of informing them about FTA, as a foundation for long-term collaboration within and beyond the sentinel landscape. Working closely with local universities is facilitating relationships with faculty members and sequential generations of students.



Capacity development

Working across the flagships and themes of FTA, the Capacity Development theme aims to identify and address critical knowledge-related gaps in our research and with our boundary partners. This is important to both successful project implementation and extending impact well beyond the project's end.

We develop capacity in a number of ways, including:

- supporting future research leaders through integration of master's and PhD students from partner universities and National Agricultural Research Institutes into research projects, and hosting visiting scientists at FTA research projects
- designing and delivering learning tools, content and approaches for audiences that range from farmers to policy analysts and implementers
- undertaking collaborative research projects with National Agricultural Research and Extension Systems involved across FTA
- establishing and working in communities of practice for knowledge sharing, application and learning
- developing and testing frameworks for strengthening public-private partnerships.

Harmonizing capacity development across FTA

Across the FTA centers, capacity development practices, systems and data are being developed to ensure knowledge gaps are identified and addressed in all FTA research. We are also establishing and populating platforms for sharing learning resources with our partners.

Training a new generation of Congolese forestry researchers

By 2005, years of conflict and economic instability had left the Democratic Republic of Congo with only six forestry researchers. A series of projects have since aimed to strengthen the country's forestry sector by supporting the future generation of forestry and agroforestry researchers in DRC with 119 MSc students graduated and more than 30 PhDs achieved or ongoing.

Capacity development by the numbers

From 2012 to 2013 more than	5000	people participated in workshops or training programs supported by FTA
>450	>200	10
interns were hosted by FTA institutions	master's and PhD students supported by FTA	research & development innovation platforms mobilized



Monitoring, evaluation and impact assessment

To know if we are reaching our goals, to stay relevant and to learn what works best, we need to monitor the effects of our research. The Monitoring, Evaluation and Impact Assessment team – comprised of a group of impact assessment specialists – provides guidance to and collaborates closely with scientists to plan, monitor and rigorously evaluate the outcomes and impacts of their research. The team is also actively collaborating with other CGIAR research programs, universities and research organizations to develop and test innovative methods for evaluating the impact of research.

Assessments in 2014-2015

- The Impact of Two Decades of Forestry Research in Congo Basin
- The Impact of Forest Co-management in Guinea
- The Impact of CIFOR's Climate Change Mitigation Research
- The Impact of Agroforestry Food Security Program in Malawi
- The Impact of the Sustainable Wetlands Project
- The Impact of Furniture Value Chain Project in Indonesia
- The Impact of the Central Asia Fruit Trees project



CIFOR & CIRAD, MAKING A DIFFERENCE

In the last 20 years, the situation regarding sustainable forest management (SFM) in the Congo Basin has changed drastically.

This graphic maps the identifiable ways in which CIFOR and CIRAD's activities contributed to changes in SFM in that time.

The evaluation found that all of the changes depicted were necessary, that is they **could not have occurred without CIFOR & CIRAD's contributions.**

(Delahais, Flichy & Ekoumou, 2014)

SFM FAST FACTS

Between 1998 & 2010,

20 MILLION HECTARES

of concessions in the Congo Basin became covered by management plans.

Forest management plans have led to:

730 000

TONS* OF CARBON SEQUESTERED ANNUALLY IN THE CONGO BASIN.

217 000

TONS OF CARBON SEQUESTERED ANNUALLY IN CAMEROON ALONE

(Cerutti, Suryadarma & Nasi, forthcoming) *Extrapolation. Contact authors for details

KEY:

- Direct influence
- Indirect influence

Direct engagement & projects funded by policymakers

CIRAD influences French development agency

International Development Agencies

CIRAD designs new formula to identify recovery rate of exploitable timber stock, adopted by all countries but Cameroon.

CIFOR's research on certification criteria and indicators allows NGOs to promote certification in Congo Basin.

Ex-CIFOR/CIRAD research staff establish NGOs

Collaboration with timber companies to test and deploy SFM instruments

Ex-CIRAD Consultants

Employed by the timber companies to help with certification

Changes in:

International Forestry Agenda

Sustainable forest management gained momentum in early 1990s, replacing strictly conservationist views. This then resulted in projects looking at non-timber forest products, forest governance, informal sector and climate change.

International Forestry Policies

New pieces of legislation adopted by ITTO, UN and EU. WB, FAO and bilateral donors also developed or updated forestry strategies.

General policy shift from conservationist to a more mixed approach. Policies target not only institutions (i.e. government) but also private sector and civil society.

National Government Forestry Policies

1994 – 2002: All countries in the Congo Basin reform forestry laws. National administrations turned into regulation and control authorities.

1996 – 2005: Authorities begin allocating exploitation rights to private companies, establish mandatory forest management practices.

1998 – 2006: National management standards adopted by these countries with arrangements on community forests and NTFPs

1999: COMIFAC established, taking forest conservation and SFM to the regional level

2003: National governments join European Commission's FLEGT (which is a semi-international policy), which ensures only legally harvested timber is imported into the EU.

2005: COMIFAC adopts a *plan de convergence*, supported by international donors.

NGO Lobbying Activities

NGOs shift from strictly conservationist to sustainable forest management approach.

WWF playing a central role in the establishment and promotion of certification process.

Greenpeace acting as watchdogs of SFM implementation National NGOs monitoring government and private practices.

Changes in Timber Companies' Practices

1998: Implementation of forest management plans begins.

2010: Area covered by forest management plans = 20 million hectares.

Since 2005, 16 companies have gained certification, covering 4 million hectares in 2013.



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Partnerships

During FTA's first three years, we implemented a successful partnership engagement approach and ranked among high performers across key partnership performance indicators in the 2012 CGIAR Stakeholder Perception Survey. Our systematic approach to partner development has involved the careful selection of partners, tailored to the specific needs of each flagship (e.g. adaptation and smallholder relevant agencies in Flagship 1; climate-relevant organizations and administrations in Flagship 4), as well as engagement with global- and national-level partners relevant to FTA as a whole. Building on the confidence this has generated, we can deliver research-based knowledge in targeted audience-specific formats.

A boundary partner survey carried out as part of an independent evaluation of FTA confirmed a high level of satisfaction with FTA's scientific quality but highlighted some recognition and adoption issues with important boundary institutions. Systematic efforts are now being made to ensure early involvement of key partners in research priority setting and, as well as at pilot/demonstration scales, ensuring a better fit of FTA targets and results with the concrete needs of development partners and funders. A quarter of our 2015-2016 budget will be allocated to partners, to further support generating knowledge, building capacity and disseminating knowledge.

Approach to partner development has involved the careful selection of partners, tailored to the specific needs of each flagship.



Communications

The FTA program brings together several hundred scientists and has hundreds of projects operating at any one time across six research centers around the world. The high volume and value of the knowledge produced demands a communications strategy to match.

With over 500 publications, 400 blogs, FTA presence at 40 international events and 18,000 page views to the re-designed ForestsTreesAgroforestry.org site in 2014, FTA research is reaching all corners of the globe and all types of audiences. Importantly, this effort has raised the profile of FTA, establishing it as an important reference for issues related to forests, agroforestry and trees, and resulting in multiple examples of stakeholders reaching out to FTA scientists for their advice, expertise and data.

To learn more about the program and see videos, publications, blogs and more:

ForestsTreesAgroforestry.org

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Publications

400
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FTA
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ForestsTreesAgroforestry.org