



Solutions for Inclusive Green Development
Soluciones para el Desarrollo Verde Inclusivo



**Executive
Summary**

ANNUAL REPORT **2023**

Our Contributions to Inclusive Green
Development in Latin America and the
Caribbean

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Message from our Director General

Dr. Muhammad Ibrahim

It is an honor and a pleasure to address you to share the outstanding achievements and significant impact that CATIE has achieved during 2023, the year in which we celebrate our 50th anniversary of unwavering commitment to Inclusive Green Development in Latin America and the Caribbean.

In 2023, CATIE continued to strengthen its strategic pillars such as knowledge generation through research, leadership development through education and training, in its external outreach activities with its national offices in member countries, and strategic partnerships with donors and private companies for the execution of regional and local projects.

In the Education pillar, the Graduate School launched blended master's programs and proposals for new master's degrees in resilient coffee systems management and sustainable livestock.

In the field of research and development, from its nine research units, CATIE has created nature-based solutions to assist producer families, governments, and organizations in Latin America and the Caribbean in addressing climate change, reversing biodiversity loss, and supporting the transition to sustainable agri-food systems with a gender focus.

CATIE continued systematically focusing on the genetic improvement of coffee and cocoa systems, as well as sustainable livestock based on agroforestry and silvopastoral systems, through the generation of scientific evidence to design mitigation policies and actions for coffee, musaceae (banana, plantain, and others), and livestock.

Furthermore, to celebrate CATIE's 50th anniversary, we organized the VIII Wallace Conference focused on six thematic sessions for the transformation of food systems in Latin America and the Caribbean, which featured the participation of highly qualified experts worldwide and generated policy recommendations to increase sustainability, resilience, and adaptation to climate change.

CATIE also resumed work in the Trifinio region, shared between Honduras, Guatemala, and El Salvador, where projects such as ESCALAR – Scaling Climate Change Adaptation Solutions for Resilience and Migration Reduction in the Central American Dry Corridor have been combined.

Additionally, lessons learned and findings from the Adaptation to Climate Variability and Change through Water Harvesting Project, implemented in Nicaragua's Dry Corridor, benefiting more than 3,000 families, were capitalized on.

These initiatives involve the Swedish International Development Cooperation Agency (Sida) for the ESCALAR project and the Swiss Agency for Development and Cooperation (SDC) for the water harvesting project.

Another geographical area where CATIE's work was resumed through the Biodiverse Landscapes Fund (BLF) was the Mesoamerican landscape, covering parts of Belize, El Salvador, Guatemala, and Honduras. Likewise, mangrove restoration in insular Caribbean areas and in Costa Rica.

In the genetic improvement of coffee and cocoa, CATIE develops projects with these crops on its farms and in 10 countries in the region to provide guidance toward sustainable production that conserves biodiversity and generates ecosystem services. Additionally, our international presence was strengthened with projects in Caribbean countries such as Cuba and Jamaica, consolidating our role in the global scientific and development scene.

In the field of livestock and environmental management, we consolidated innovative methodologies and launched a pilot plan for low-carbon livestock in Honduras, benefiting thousands of producer families.

Our contribution to climate action stood out during 2023 by integrating research results and developing methodologies to address ecosystem mitigation and adaptation to climate change.

We also consolidated the ACTIVA-CATIE program as our rural innovation and entrepreneurship laboratory.

Among other significant contributions in 2023, CATIE's creation of the Gender Unit stands out, reflecting our commitment to equity and social inclusion in all our actions.

To achieve our mission, we strengthened partnerships with committed donors such as KoLFACI, the Biodiversity International-CIAT Alliance, the Mitigation Action Facility, the Global Crop Diversity Trust, the Swiss Agency for Development and Cooperation (SDC), the Swedish International Development Cooperation Agency (Sida), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the French Agricultural Research Centre for International Development (CIRAD), the World Resources Institute, World Coffee Research (WCR), and many others.

Your support has been essential in diversifying our income and successfully carrying out key projects. Our collaborations with private companies such as Starbucks Coffee Company and Southwest Airlines

also highlight our ability to lead innovative sustainability and development initiatives.

Our research and teaching staff received numerous awards during the year, highlighting CATIE's excellence and positive impact in various national and international fields. For example, the award granted by the Korean Ministry of Agriculture, Food, and Rural Affairs for research and development projects in coffee and cocoa in the region. Additionally, the Vice President of Guatemala, César Guillermo Castillo, thanked CATIE for the support and accompaniment provided, which was fundamental to fulfilling the National Development Priorities and General Policy of his country. A similar distinction was received from the Council of Ministers of Agriculture for our contributions.

It has been a year of many financial and administrative challenges affected by global and particular conditions of our member countries. However, we took proactive measures to safeguard the institution's financial stability without compromising the execution of donor-funded projects or resorting to staff reductions. Thus, I am proud to say that we managed to increase CATIE's base budget and achieve a positive financial balance at the end of the 2023 fiscal year.

As of March 1, 2024, I conclude my eight years as Director General of CATIE; therefore, this report represents the last of my tenure. I take this opportunity to thank the entire CATIE community for their unwavering support.

I also take this opportunity to inform you that, in the selection process, Dr. Luis Pocasangre was elected as the next Director General of CATIE. I wish him great success in his tenure, and I am confident that under his leadership, CATIE will continue to position itself to provide solutions for inclusive and green development in Latin America and the Caribbean.

With gratitude,

Dr. Muhammad Ibrahim

Education:

Training Leaders Impacting Inclusive Green Development

CATIE has played a fundamental role in the development and strengthening of capacities in sustainable agriculture and environmental management in Latin America and the Caribbean. These are the main results of 2023.

- › As part of the milestones of the year, Mariela Leandro, a recognized researcher and reference at CATIE, became the new Dean of the Graduate School.
- › In addition, CATIE graduates assumed prominent roles in Latin American universities.
- › Juan Rosa Quintanilla, originally from El Salvador and a graduate of the 1993-1994 class, took over as the rector of the University of El Salvador.
- › Edgar Fernando Talavera, a Bolivian national and a graduate of the 2003-2004 class, was appointed dean of the Faculty of Agriculture and Veterinary Medicine at the Evangelical University of Bolivia.

CATIE has transitioned to  a new education model

2016 ›



- › **100% on-site scientific programs**
- › **155 students**

- Agroforestry and Sustainable Agriculture (MAAS)
- Economics, Development, and Climate Change (MEDCC)
- Management and Conservation of Tropical Forests and Biodiversity (MCBTB)
- Integrated Watershed Management (MGICH)

2023 ›



- › **65% virtual professional programs**
- › **35% on-site scientific programs**
- › **339 students**

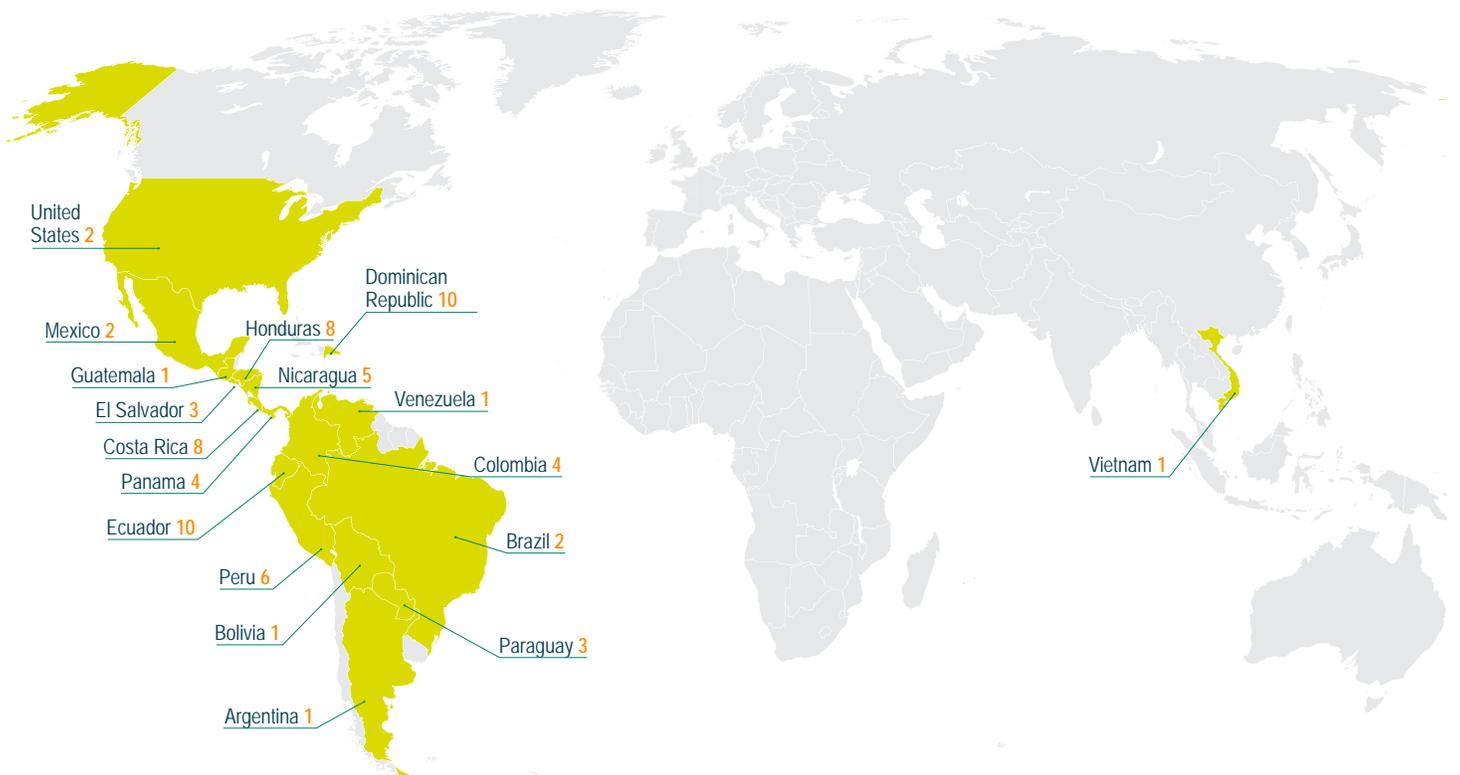
- Sustainable Agribusiness and Markets Management (GANEMOS)
- Watershed Management (MGCH)
- Sustainable and Regenerative Coffee Agriculture (Master in Coffee)

Graduation 2023

72 students (58% women)
18 countries

In 2023, 72 students from 18 countries graduated from Master's and Ph.D. programs, and 33 young people from 15 different countries entered for their postgraduate studies. In both cases, there was a higher percentage of women.

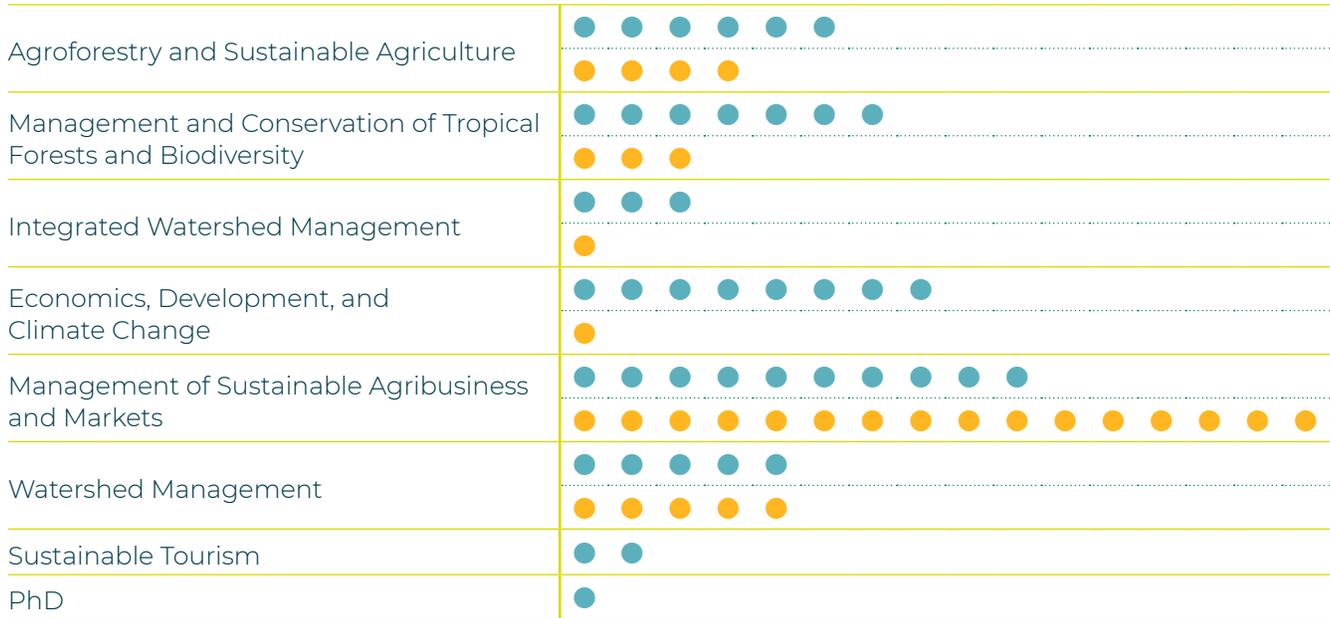
Country of origin of graduate students 2023



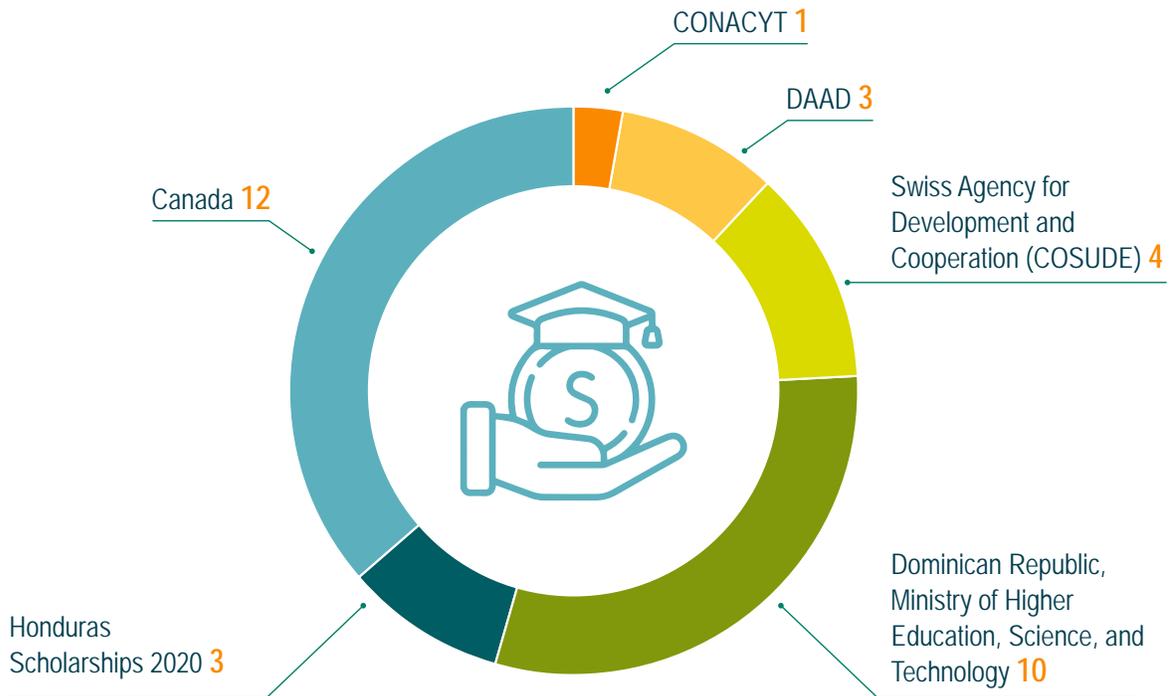
New Academic Offer

- In September 2023, the Master's in Watershed Management and Governance began in two modalities: virtual professional and bimodal academic.
- In September 2023, the Master's in Agribusiness and Sustainable Markets, virtual modality, started.
- In November 2023, the Master's in Sustainable and Regenerative Coffee Agriculture in virtual modality opened.
- For 2024, the opening of the Master's in Sustainable Livestock is planned.
- Under review, the curriculum of the Master's in Sustainable Intensification of Animal Production in the Tropics.

Master's and PhD Programs CATIE 2023



Sources of scholarship funding



Success Story: GANEMOS Master's

● In 2023, we celebrated five years since the start of the agribusiness and sustainable markets management master's program (GANEMOS).

In this year, 27 new students joined (12 women), with the notable participation of professionals from 12 countries in Latin America and the Caribbean. For the first time, we have a professional from Africa (Angola).

In these five years, 198 students (36.4% women) from 21 countries around the world have been part of the master's program. Most are still pursuing the master's, and we already have 68 professionals who have completed their studies.

The GANEMOS program is successful due to its innovative approach based on managing businesses that are socially and environmentally responsible, promoting local development (a mission for CATIE) by connecting productive landscapes with markets differentiated through global value chains where products of high socio-environmental value are traded.

The methodology implemented responds to the needs of professionals who are working, using active learning foundations and various methods such as the Learning Project, case studies, and others. Professionals acquire

knowledge and tools that they can immediately implement in their work.

The most outstanding achievements of the master's are closely related to graduation projects, which materialize the practical application of acquired knowledge. These projects have had a significant impact on various entities, including non-governmental organizations (NGOs), governments, and companies.

An emblematic example of these successes is the implementation of a blockchain-based control system for the designation of origin of Loja coffee in Ecuador. This initiative has proven crucial for preserving and authenticating the quality of local coffee.

In addition, a notable increase in company income has been observed, as evidenced in the case of a company in Mexico. The effective application of knowledge and tools acquired during the master's has led to an impressive 800% increase in income, positively impacting job generation in terms of both quantity and quality.



Training >

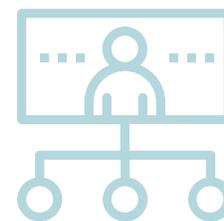
13 116 trained individuals

The Training Unit and the Graduate School developed diplomas, talks, conferences, courses, workshops, congresses, seminars, whose topics emerged from a survey among CATIE graduates to understand their needs for updating and strengthening capabilities.

Additionally, CATIE provided training to technicians and producing families throughout Latin America and the Caribbean, resulting in a decrease in food insecurity for agricultural families.

Modalities offered: face-to-face, virtual, and bimodal.

Countries: Peru, Guatemala, El Salvador, Honduras, Belize, Nicaragua, Costa Rica, Panama, Bolivia, Dominican Republic, Colombia, United States, Cuba, Switzerland, Spain, Germany.



Research:

Generation of Scientific Knowledge



CATIE has reaffirmed its commitment to promoting

● Inclusive Green Development, aiming to improve human well-being and reduce rural poverty.

CATIE resumed research and development work in the Trifinio region, shared between Honduras, Guatemala, and El Salvador, combining projects such as ESCALAR– Scaling Climate Change Adaptation Solutions for Resilience and Migration Reduction in the Central American Dry Corridor. Lessons and findings from the Adaptation to Climate Variability and Change through Water Harvesting Project, implemented in the Dry Corridor of Nicaragua, were capitalized on.

These initiatives involve the Swedish Cooperation for Development (ASDI) for the ESCALAR project and the Swiss Cooperation for Development (COSUDE) for the water harvesting project.

Another geographical area where CATIE's work is resumed through the Biodiverse Landscapes Fund (BLF) is the Mesoamerican landscape, covering parts of Belize, El Salvador, Guatemala, and Honduras.

Additionally, mangrove restoration in both the insular Caribbean and Costa Rica.

The CATIE Inclusive Green Research and Development also allowed consolidating work in:

- › Sustainable, regenerative, and low-emission livestock.
- › Application of climate-smart agriculture practices in new and modern clonal agroforestry systems of cocoa contributing to carbon sequestration.
- › Design and implementation of nature-based solutions in urban and transboundary watersheds.
- › Agroecological design of production systems that focus on circularity for food and nutritional security.

Partnerships to develop high-level scientific events »

In 2023, CATIE hosted two internationally relevant scientific events.

- » Second Meeting of Authors of the Transformative Change Assessment - IPBES. This event organized by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) involved 86 experts from 15 countries. Six of them also participated in the Wallace Conference, three as keynote speakers.
- » VIII Wallace Conference, from May 30 to June 2. Since 2002, in collaboration with different international partners, the Wallace Scientific Conference has positioned itself as a forum for discussing strategies in science and technology for tropical agriculture, natural resources, and biodiversity conservation in the tropics. The eighth edition focused on six thematic sessions for transforming food systems:
 - Impacts of land and water degradation in the face of climate change.
 - Strategies and paths of innovation for climate adaptation and mitigation actions.

- Financing, investments, and agribusiness.
- Sustainable patterns of production and consumption.
- Equitable access to food.
- Governance for transformation.

The organization was made possible through partnerships to ensure funding and the participation of keynote speakers.

- CATIE - MUSE
- CATIE - University of Montpellier
- CATIE - CIFOR
- CATIE - Embassy of France

170 people from 20 countries, 60 institutions, and 100 oral presentations and posters.

Two additional products:

- » Roadmap for the Transformation of Food Systems in Latin America and the Caribbean: Contribution of the VIII Wallace Conference (June 2023).
- » VIII Scientific Wallace Conference Proceedings

Special research topic for CATIE's 50th anniversary

Progress is being made in the publication of the special topic titled "***Transformation of Food Systems in Latin America and the Caribbean: Increasing Sustainability, Resilience, and Adaptation to Climate Change***," in the scientific journal FRONTIERS.

Strategic partnerships to support education and research »

- » **University of Wisconsin:** Researchers follow up bilaterally after the meeting held in June.
- » **Michigan State University:** An agreement was signed to extend collaboration between both entities to promote community development and sustainable tourism. The focus will be on student exchange and attracting teachers from Michigan, particularly those linked to community outreach.
- » **Texas Tech University (TTU):** A memorandum of understanding was signed in October. Four research opportunities were identified for 2024:
 - The use of robotics to positively impact various aspects of agroforestry.
 - Development and application of geospatial technologies to address issues in conservation science and support the spatial prioritization of conservation actions in natural environments.
 - Training and development of circular systems in the coffee chain in the Trifinio dry corridor.
 - Pragmatic Massive Open Online Course (MOOC) addressing the complex dynamics between forestry and sustainable agriculture, merged with circular construction methods driven by industrial innovation.



Through its 9 research units, CATIE has developed nature-based solutions to assist producer families, governments, and organizations in Latin America and the Caribbean in addressing climate change, reversing biodiversity loss, and supporting the transition to sustainable agri-food systems with a gender focus. Here is a summary of our work:

••• Our work ›

Climate Action

CATIE contributed to climate action by integrating research results into knowledge dissemination and the development of methodologies and tools that incorporate mitigation and adaptation responses to climate change.

Resilient infrastructure design

- › Integration of nature-based solutions to reduce risks in public infrastructure investments in drinking water, sanitation, and viability in Central America and the Dominican Republic.
- › The provided tools enable countries to develop public investment projects focusing on disaster risk reduction and sustainable adaptation to climate change.

Climate risk management

- › Definition of action plans to manage climate risks (droughts, floods) in agricultural and livestock systems in Guatemala, Honduras, and El Salvador, used to guide multi-donor investments in the region.
- › Development of vulnerability analyses in Cuba as a basis for integrating adaptation in agriculture and livestock into municipal policies.
- › Support plans for investments in the adaptation of agriculture and livestock in Rwanda and Ethiopia through the validation of participatory mapping processes at the national and sub-national levels.

Governance strengthening

- › Integration of the Brazilian Model Forest Network into the Latin American Model Forest Network, strengthening governance and organization for the sustainable management of landscapes.

Nature-based Solutions in critical Central American landscapes

- › Initiation of the Reforest project, reducing disaster risk and early warning systems in Belize, Guatemala, and Honduras (in collaboration with the Forest, Biodiversity, and Productive Landscapes Unit).
- › Initiation of the Resilient and Biodiverse Landscapes in North Mesoamerica project in Belize, Guatemala, Honduras, and El Salvador (in collaboration with the Forest, Biodiversity, and Productive Landscapes Unit).

Continuous update of demand-based decision support systems

- › Mangrove ecosystem map for Costa Rica.
- › Municipal governance monitoring system for food security and nutrition in Guatemala.
- › Atlas Verde V2: A tool supporting the management of green infrastructure in 31 cantons and 7 biological corridors in Costa Rica, accessible [here](#).
- › The Meso-drought digital platform for the entire Central America, providing drought data to improve the understanding of climatic processes in the region.



Agrobiodiversity and Food Security

In 2023, CATIE excelled in implementing four fundamental projects in Central America, addressing various areas, from climate-smart livestock transformation to disease prevention in banana production.

Transforma-Innova program (Costa Rica):

- › Funding: IKI Germany and the European Union.
- › Focus Areas: Climate-smart transformation in livestock, coffee production, and Musaceae (banana, plantain, and others).
- › Goal: Reach over 4,000 producers in two years.
- › Notable Achievement: Establishment of foundations, review of relevant "Good Practices" technical and didactic materials, model farm surveys, and launch of an idea contest.

Agroinnova project (Central America)

- › Funding: European Union.
- › Impact: Support to over 3,000 families and 12 organizations in 6 countries.
- › Key Topics: Agroforestry to increase resilience to climate change and productive diversification, goat production, empowerment of rural communities, and business organization.
- › Challenges: Climate change and water scarcity in the Dry Corridor, lack of employment sources.
- › Project Results

Kafe Makaya (Haiti):

- › Funding: Canada.
- › Objective: Regeneration and reactivation of coffee production in southern Haiti.
- › Focus: Support to thousands of producers and small groups to increase productivity and income.
- › Significant Result: Transformation and processing of coffee to generate higher income.

PITAG program (Haiti):

- › Goals: Soil conservation, resource recycling, composting, and redesign of cocoa and coffee production systems.
- › Notable Contribution: Strengthening the capacities of technicians and agronomists at the national level in Haiti.

Regenerative production (Central America and Amazon):

- › Collaboration with: NAR Project (Regenerative Agri-food Businesses).
- › Objective: Evaluate and support agri-food businesses dedicated to regenerative production.
- › Focus: Avoid negative environmental impacts and encourage productive diversification.

AUSCAR project (Caribbean and Central America)

- › Funding: European Union, in collaboration with CIRAD.
- › Scope: ONE HEALTH - Prevention of animal diseases and phytopathological epidemics.
- › Recent Achievement: Successful conclusion of the first phase, preparing for follow-up in 2024.
- › Focus: Strengthening the capacity of organizations in countries neighboring the Caribbean to respond to and prevent epidemics.



Orthodox Seed Germplasm Bank

In 2023, the Orthodox Seed Germplasm Bank continued its efforts to locate, collect, conserve, characterize, and distribute the germplasm (seeds) of plants considered of priority interest for strengthening and ensuring the food sovereignty of the region.

The main significant milestones achieved are:

Regeneration program

- › Successful development and execution of a regeneration program for 1106 squash, chili, and tomato accessions.
- › Financing granted by the Global Crop Diversity Trust.
- › Objectives include increasing preserved seeds, ensuring germplasm, and providing security duplication in Svalbard.

Significant distributions

- › Carrying out 84 distributions to farmers, institutions, and research centers.
- › Essential contribution to crop diversity and food security.

Technical training

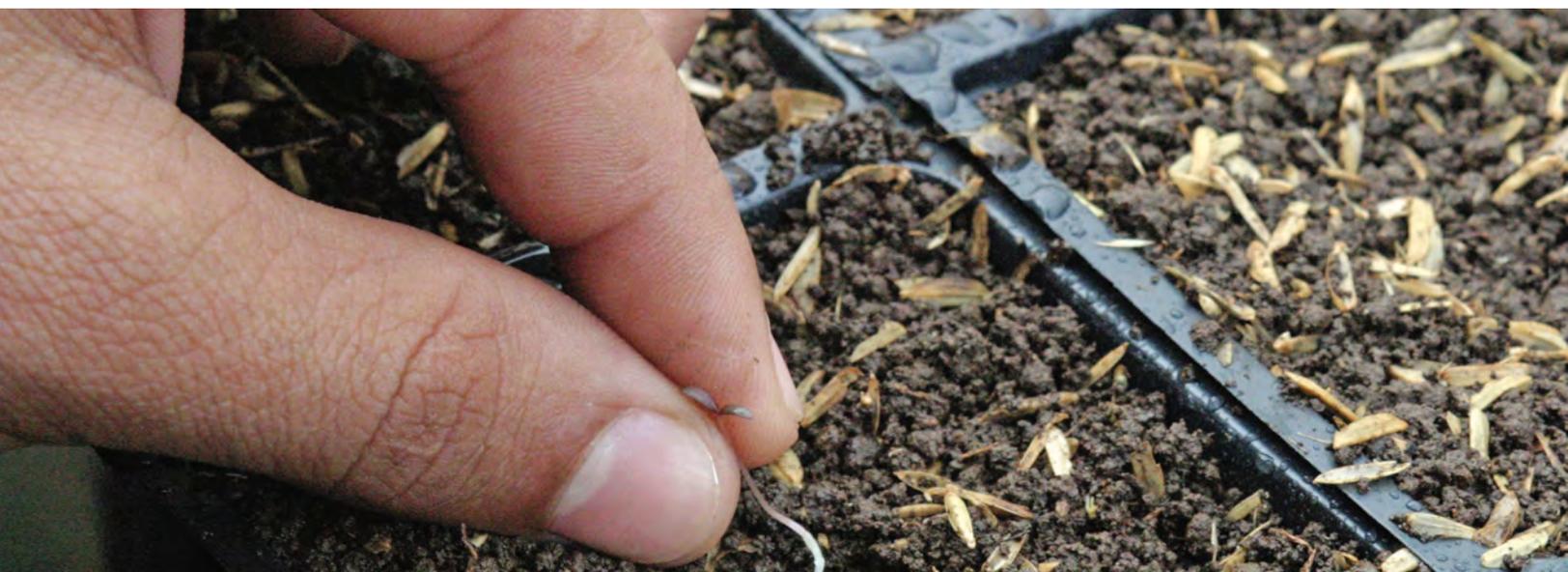
- › Training of the technician and curator of the Germplasm Bank in Montevideo, Uruguay.
- › Financing provided by the Crop Trust.
- › Data Manager workshop focusing on data-base management for germplasm banks.

Educational support

- › Collaboration with students, hosting three undergraduate students, and supervising a bachelor's thesis.
- › Involvement with pre-university students, contributing to academic and scientific development.

Visitor attention

- › Attention to 54 visitors, including national and international farmers, tourists, and members of educational institutions.
- › Contribution to knowledge dissemination and strengthening ties with various sectors.



Agroforestry and Genetic Improvement of Coffee and Cacao

The year 2023 was remarkable for CATIE in terms of agroforestry and the genetic improvement of coffee and cacao, taking us to new frontiers and highlighting our international presence. Two projects in the Caribbean have captured our attention, one in Cuba and another in Jamaica, addressing innovative practices in animal production and spice cultivation, respectively.

CATIE has continued the conservation of the most important genetic diversity of coffee and cacao for the Latin America and the Caribbean region.

The international germplasm collections maintain 2,000 coffee accessions and 1,250 cacao accessions.

Fundraising for the upgrade of the coffee collection continues, rescuing over 160 accessions at risk of loss, and the relocation of the collection has begun to another area within CATIE's estate to renew priority accessions and move to a new, more suitable soil for plant conservation.

CATIE has worked in partnership with CROP TRUST to secure funds for this task, which began in 2023 and will last for two to three more years.

CATIE is also part of the global INNOVEA initiative of the WCR, being the place for the characterization of new improved materials and seed distribution to countries in the region starting in the coming years.

In the year, partnerships were signed with several private companies such as Yara and ADAMA to preserve the International Coffee Collection.

In cacao, CATIE conducts research in the collection with the support of public and private institutions such as USDA, CEPLAC, MARS, NESTLE, LINDT, which also allows the conservation of collection areas. Research includes the evaluation of materials on productivity, reaction to pests and diseases, and sensory and organoleptic quality parameters.

Both in coffee and cacao, there are trials for genetic improvement purposes. In coffee, there are trials at high and low altitudes evaluating over 50 hybrid families. In cacao, eight new promising clones have already been identified, and there are more than five trials of plants in the form of hybrids and clones for new sets of improved materials.



For cacao, with projects starting from 2024, the idea is to establish multi-location trials for evaluation in different agroecological conditions in Costa Rica, and potentially in Mexico and Honduras.

Thanks to the Korean cooperation of RDA-KOLFACI, research on production and ecosystem services in coffee and cacao is being developed in the Latin America and the Caribbean region.

There are 52 cacao plots and 46 coffee plots where research is conducted among producers, technicians, students, and researchers. It is a network that spans 10 countries: Bolivia, Peru, Colombia, Panama, Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala, and the Dominican Republic.

We have results on the effects of the application of climate-smart agriculture practices in new modern clonal agroforestry systems of cocoa, where cocoa yields are at least three times higher than national averages, the best clones are identified, the potential fruit and wood production is projected, as well as the estimation of important regulatory services such as carbon sequestration.

In coffee, there are preliminary results on the effects of the interaction of improved varieties with pruning types, where the most successful pruning types are already increasing yields by at least 30% compared to traditional varieties and pruning types. Both projects (coffee and cacao) will be expanded for the 2024-2026 period.





Agroforestry trial research at CATIE

We maintain a nine-hectare trial since 2000 (23 years of data) where we investigate the results of a series of ecosystem services provided by 20 different systems (combinations of shade and conventional and organic management): coffee production and quality, wood production, carbon sequestration, pest regulation, variables related to soil fertility, and nutrient recycling.

Most agroforestry systems, especially those combined with legumes, are generating the most promising benefits for all mentioned services and with good financial performance (benefit/cost ratio greater than 2). These results and applied management innovations are used in other CATIE projects to promote sustainable practices.

Through other international projects, CATIE also provides technical advice on coffee and cacao in countries such as Ecuador, Haiti, Guyana, Puerto Rico. Additionally, actions are expected in Mexico with local partners. In these projects, advice is provided on topics ranging from the propagation of plants from improved materials, agroforestry design, research, preventive measures for disease prevention and control. It can be said that CATIE has a presence and visibility in the vast majority of LAC countries.

Agroforestry projects

CATIE is also developing agroforestry projects such as the one called CIENPINOS.

This project is titled Municipal Climate Governance and Sustainable Agroforestry Food Production with Low Emissions and Adapted to Climate Change in Cienfuegos and Pinar del Río, Cuba (2023-2026).

It proposes that local actors and governments of the municipalities of Viñales and La Palma (Pinar del Río province) and Cumanayagua and Abreus (Cienfuegos province), Cuba, through good climate governance.

Diversified management of natural forests and agroforestry production achieves the sustainable local development of food production, mitigating and adapting to climate change, and conserving biodiversity. Partners in Cuba include the Indio Hatuey Experimental Station (EEIH), universities, municipal and provincial governments, among others.



In 2023, negotiations were also conducted with ACIDI/VOCA for CATIE's consultancy in a large spice project such as turmeric, ginger, and pimento in Jamaica (JASPICE), starting this year and lasting until 2025. CATIE will provide assistance for the design of agroforestry systems that allow good production and carbon capture, design of priority research, technical manuals, organization of field school groups, market search, and valuation of ecosystem services.

Also in 2023, CATIE's INAFORESTA, MAK'IT from the University of Montpellier, the International Center for Agricultural Research and Development (CIRAD)-UMR-ABSys, the agricultural systems and engineering laboratory of West Lake University, the company Mars, and the International Union of Agroforestry (IUAF) organized the workshop titled Cocoa agroforestry in West and Central Africa: from definition to innovation and implementation pathways. The aim was to contribute to the debate on the definition of agroforestry with cocoa and shed light on the necessary paths to massify the use of agroforestry in sustainable cocoa production.

Reference on cocoa research

In 2023, CATIE organized and developed the Latin American and Caribbean Forum: Challenges and guidelines for a modern and sustainable cocoa culture in the region.

It was a significant event that brought together important actors in the research, technical, and project coordinator fields, with 130 people attending in person and 900 registered virtually.





Biostatistics

Generation of knowledge

- › Publication of relevant research, such as the meta-analytical work on shade plant diversity in agroforestry systems in Scientific Reports.
- › Acceptance of publications like the multidimensional study of climate change sensitivity in mountain tropical forests.

Presentation at scientific events

- › Active participation in the VIII Wallace Conference, highlighting presentations on simulators for pest management in coffee and methodologies for reducing fungicides in banana disease management.
- › Presentation of research on market opportunities and the impacts of Covid-19 on agroforestry chains in Nicaragua and Costa Rica.

Development of tools

- › Creation of tools for carbon emission balance accounting and multi-agent simulators to evaluate management strategies in agriculture.
- › Development of object detection tools using computer vision for monitoring pests in coffee plantations.

Education

- › Delivery of specialized courses in statistical tools, data analysis, and R programming for the graduate school.
- › Support for Ph.D. student José A. Vergara Paternina from the University of the North, Colombia.

Staff training and consulting

- › Graduation of Dr. Sergio Vilchez Mendoza in the Ph.D. in Mechanisms of Pathogenic and Symbiotic Interactions at the University of Montpellier, France.
- › Training courses in advanced statistics and multivariate analysis for strategic partners and participation in key projects.

Forests and Biodiversity in Productive Landscapes

Research for development

Focused on mature forests, secondary forests, and wildlife, the Forests and Biodiversity in Productive Landscapes Unit (UBBPP), in coordination with the Latin American Chair of Ecology in the Management of Natural Forests at CATIE, has continued long-term research through a network of permanent plots in mature forests along an altitudinal gradient.

Highlights

Research for mountain forest adaptation to climate change

We continue our over-a-decade-long research in mature forests along an altitudinal gradient and its implications for the adaptation of mountain forests to climate change. A network of permanent plots for the study of mature forests has been consolidated. UBBPP's research on mountain forests has been

disseminated to the scientific community through various globally recognized peer-reviewed publications, such as:

- ▶ Hernández-Gordillo, Alba Lorena, Vilchez Mendoza, Sergio, Ngo Bieng, Marie Ange, Delgado, Diego, Finegan Bryan. 2021. Altitude and community traits explain rainforest stand dynamics over a 2370-m altitudinal gradient in Costa Rica. *Ecosphere*, 1-11.
- ▶ Esquivel, Jimena, Park, Byung Bae, Casanoves, Fernando, Delgado, Diego, Park, Go-Eun, Finegan Bryan. 2019. Altitude and species identity drive leaf litter decomposition rates of ten species on a 2950 m altitudinal gradient in Neotropical rainforests. *Biotropica*, 1-11.
- ▶ Veintimilla, Dario, Ngo Bieng, Marie Ange, Delgado, Diego, Vilchez-Mendoza, Sergio, Zamora, Nelson, Finegan, Bryan. 2018. Drivers of tropical rainforest composition and alpha diversity patterns over a 2,520 m altitudinal gradient. *Ecology and Evolution*, 5720-5730.
- ▶ Finegan, B., Delgado, D., Hernández, A.L., Zamora, N., Núñez, R., Díaz, F., Vilchez, S. 2024. Multi-dimensional temperature sensitivity of protected tropical mountain rainforests.



Collaboration with costa rican environmental authorities

Conducted a workshop with officials from the Costa Rican National System of Conservation Areas, sharing recent findings: CATIE presents key research for the adaptation of mountain and páramo forests to climate change. This reaffirms our commitment to supporting forest adaptation strategies to climate change.

Contribution to the National Fores Congress in Guatemala

Our results were presented at the National Forest Congress in Petén, Guatemala, strengthening CATIE's presence and contributions to international events.

Strengthening research in secondary forests and pollinators in the Trifinio Region

Efforts have been dedicated to strengthening research in secondary forests, crucial in Mesoamerica, with the aim of improving management and utilization for the benefit of rural communities.

Research has focused on secondary forests as vital ecosystems for biodiversity and, particularly, for pollinator communities in the Trifinio region, the border area between El Salvador, Guatemala, and Honduras.

Workshops included extensionists, promoters, and farming families related to coffee cultivation, horticulture, basic grains, fruits, beekeeping, and secondary forests.

Regionally, technical and research personnel associated with government agencies, academia, and non-governmental organizations participated.

Linking with pollinators

Continuing previous efforts, in 2023, we expanded our research in secondary forests, exploring the relationship with pollinator communities and their importance in productive landscapes for biodiversity conservation and agricultural productivity in Mesoamerica and the Caribbean.

Manual:

- › Conservation of birds, bees, and the ecosystem services they provide to coffee production: Good Practices Guide.

Posters

- › Birds and coffee berry borer control
- › Birds, bees, and coffee cultivation

Enterprises, nature, and innovation

UBBPP also works to promote sustainable forest management and natural resource use, supporting the development of rural enterprises whose business models use Nature-Based Solutions. This is implemented through its innovation and enterprise laboratory called ACTIVA-CATIE.

ACTIVA-CATIE

In 2023, ACTIVA-CATIE consolidated its position as an innovation and entrepreneurship laboratory in the rural sector, standing out for its contribution to biodiversity and productive landscapes. Its role as a driver of innovation and entrepreneurship in the rural sector demonstrates a continuous commitment to sustainable development and the promotion of creative solutions at CATIE and beyond.

ACTIVA-CATIE launched three calls throughout the year, attracting more than 70 enterprises that received seed capital support.

Additionally, 14 enterprises were advised and trained, strengthening their capacities and business models.

Key alliances were established with Conecta, Banco Nacional, and SBD, reinforcing the support network for rural enterprises.

The integration of ACTIVA into the Forests Unit highlights its significant contribution to biodiversity and productive landscapes.

Over a thousand people have benefited from training in business models, associativity, and nature-based solutions, promoting rural enterprises across the Costa Rican territory.

More than 30 enterprises have been selected with seed capital specifically for the EbA LAC project.

Identified and supported 30 new enterprises in regular calls, reaching a total of over 120 enterprises since the activity began in 2020.

On November 22, the second edition of the business event for rural transformation and development took place in San José: Entrepreneurship, Innovation, and Nature (EMIN 2023) became ACTIVA-CATIE's space to connect rural entrepreneurs with key actors that enhance business opportunities, knowledge transfer, and synergy creation. 32 entrepreneurs focused on regenerative agriculture, ecotourism, bio-inputs, livestock, among others, participated. Representatives from public institutions, the private sector, and international organizations also attended.

ACTIVA-CATIE consolidates itself as a cross-cutting element, linking not only with the Forests Unit but also with other CATIE units.

This integration strengthens synergy between areas, maximizing the impact and reach of entrepreneurial initiatives.



Watersheds, Water Security, and Soils

Research and innovation in water harvesting systems

Throughout 2023, the Watersheds, Water Security, and Soils Unit have excelled in research and innovation focused on water harvesting systems as an adaptation strategy to climate change. Among the achievements, the creation of a tool and a web application for smartphones stands out, enabling the prioritization of suitable sites for water harvesting structures.

Pioneering advances in comprehensive models

- › The unit has led pioneering research by incorporating water harvesting sites into the SWAT model (Soil and Water Assessment Tool).
- › Results reveal a co-benefit in watershed water recharge through these infrastructures initially designed for agroproductive systems.
- › This finding was corroborated using stable water isotope methodology.

Scaling tools and lessons

- › Progress has been made in scaling tools and lessons, including the implementation of the application in other sites with conditions similar to the Central American Dry Corridor.
- › This project, supported by the Swiss Cooperation for Development, aims to adapt to climatic variability and climate change.

- › A Water Harvesting Atlas was created, showcasing the results of 1,783 water harvesting structures. This Atlas has a digital counterpart to be hosted on the Water Harvesting Hub and a printed version in Spanish and English.

Consolidation in Nature-based Solutions for urban watersheds

- › The unit has consolidated its research line in nature-based solutions for urban watersheds.
- › Methodologies and practical solutions were implemented, such as reforestation in green and urban corridors and slopes surrounding cities, exemplified in the complex watershed of Cabo Haitiano in Haiti.
- › This approach is complemented by training and awareness-raising for civil society and stakeholders.



Techno-organic water-based solutions

- Looking ahead to 2024, we are building and strengthening research lines on watershed sanitation and techno-organic water-based solutions, in collaboration with the Advanced Center for Applied Research-CAIA, where the Unit is responsible for conducting the assigned laboratory under a scientific collaboration approach.
- We also have in the "design and construction" phase our teaching-learning space on the CATIE campus, allowing us to showcase on-site key elements and processes of watershed management.

Contributions from our specialists

In November 2023, the Elsevier Journal recognized our colleague Ney Ríos for the publication "*Effects*

of land use change on water availability and water efficiency in the temperate basins of south-central Chile." The recognition values the contribution to science and the ability to drive social progress and promote the United Nations Sustainable Development Goals (SDGs): SDG2, SDG6, SDG15, and SDG17. This publication is the result of collaboration with other research groups in the region.

Our master's programs

- In 2023, both the face-to-face academic master's and the professional virtual master's on watersheds were opened, with academic development overseen by the Unit, totaling 20 students.
- Additionally, the design of the master's program in its bimodal academic format was achieved.

Success story: Nicaragua Water Harvesting Project Adaptation of Agriculture to Climate Change through Water Harvesting in Nicaragua

Final Phase:
November 2022 to December 2023
2 million dollars (USD)

202 water harvesting structures
41 families in natural corridors
150 bird species in the dry season

Highlights

- Transformation of the productive systems of families in the Dry Corridor, through the availability of water by constructing 202 water harvesting structures, allowing the storage of about 200,000 m³ of water for irrigation and livestock watering.
- This action positively contributes to the water balances of the hydrographic basins in the Las Segovias region and serves as connectors between natural bird resting sites.
- A study conducted by the project recorded 41 families and 150 bird species in the dry and rainy seasons, representing 20% of birds reported for Nicaragua.

Perceived benefits by producing families

- › Increased number of planting seasons throughout the year (due to the possibility of producing in the dry season).
- › Expansion of the cultivated area with annual and perennial crops.
- › Crop diversification.
- › Increases in productivity in agricultural and livestock systems.
- › Reduction of time spent providing water to animals.
- › Perception of increased land value due to greater water availability on farms.

It is important to highlight that extensive capacity-building efforts have allowed women to be active participants in the project, improving their power relations at home. Now, women have the knowledge to install and manage drip irrigation, prepare organic fertilizers and insecticides, build soil and water conservation structures, associate and rotate their crops, and establish improved pastures.

Contribution of the project to comprehensive knowledge management

- › 2,340 vulnerable families in the Dry Corridor of Nicaragua to climatic variability were strengthened in their capacities.
- › 9 thesis research, master's, and postgraduate research.
- › 3 certified diploma courses for 65 national and international professionals.
- › 4 learning routes that include 20 host farms to share knowledge.
- › 1 mobile application. This app is used to identify suitable sites for water harvesting.
- › 1 Water Harvesting Hub. This platform contains the most relevant results of the project.
- › 3 specialized studies
 - Multidimensional effect of the Water Harvesting project.
 - Earth reservoir waterproofing tests.
 - Characterization of livestock in Central America.



Environmental Economics and Sustainable Agribusiness Unit

The Environmental Economics and Sustainable Agribusiness Unit have led the development of 20 projects during 2023. These projects have been carefully designed to improve the well-being of producer families, community organizations, and small rural businesses, aligning with CATIE's mission.

Achievements in project implementation

Strengthening 400 micro, small, and medium enterprises (MSMEs) in the countries of the Central American Integration System (SICA)

- › Successful implementation of the "Curricular Plan for Continuous Training for Rural MSMEs" in collaboration with FAO and CENPROMYPE, benefiting over 400 rural enterprises in Central America.
- › Participating enterprises (56% led by women) were linked to the agro and service sectors, and as a result of their participation, significant progress has been made, such as successful entry into new markets and product improvement with an emphasis on nutrition-sensitive value chains.

EbA LAC Program Increases Climate Change Resilience Capacity in Vulnerable Rural Areas of Guatemala, Costa Rica, and Ecuador

- › The program "Scaling Measures of Ecosystem-Based Adaptation (EbA) in Rural Latin America (EbA LAC)" is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) through its International Climate Initiative (IKI).
- › In partnership with GIZ (consortium leader) and IUCN, and thanks to alliances with political counterparts and key actors in the territories, CATIE achieved decisive results in 2023, including: 106 technicians/extensionists (35% women) from key organizations for the scaling of the EbA approach in Guatemala and Costa Rica attended the Training of Trainers in EbA, with content on soft and technical skills.
- › 30 entrepreneurs in Costa Rica were selected (63% women) to facilitate access to financing and the implementation of (EbA) measures in prioritized rural ventures, with the support of the Development Banking System (SBD).
- › As part of the business incubation process, about 250 people were trained in entrepreneurial and climate change adaptation topics.
- › Sensitization and alliances with the financial sector to develop credit products incorporating the concept of climate risk.



EbA LAC Program

- › Scope: EbA LAC is a regional project (Guatemala, Ecuador, and Costa Rica) implemented by GIZ, IUCN, and CATIE, funded by the International Climate Initiative (IKI) of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) of Germany.
- › Beneficiaries: Over 100 extensionists and technicians.
- › Training Approach: Includes technical aspects and soft skills.

Launch of entrepreneurial initiative in Costa Rica

- › Key Collaboration: Joint initiative between Development Banking and the Activa CATIE incubator.
- › Goal: Financing for more than 30 ventures in Costa Rica.

Strategic partnerships

- › Key Collaborators: Effective coordination with Ministries of Environment and key actors in the territories.
Results: Facilitation of strategic partnerships that enhanced the program's success.

Global impact

- › The achievements reflect CATIE's commitment to strengthening technical and professional capacities in the field of Ecosystem-Based Adaptation.
- › The entrepreneurial initiative in Costa Rica demonstrates CATIE's ability to drive innovative and sustainable projects, generating a positive economic impact.
- › The combination of technical training and strategic collaborations positions CATIE as a leader in implementing sustainable practices in Latin America, demonstrating its significant contribution to regional development and the promotion of approaches harmonizing with ecosystem conservation.

Analysis for the Feasibility of a Water Fund in the Trinational Basin of the Lempa River

- › With financing from the Inter-American Development Bank (IDB) and the support of the Trinational Commission of the Trifinio Plan (CTPT) and a wide range of local actors, CATIE determined the technical feasibility of creating a financial mechanism or Water Fund to restore the Lempa River basin.

- › This is one of the most important basins for Guatemala, Honduras, and El Salvador, as it provides water for irrigation, industry, energy, and the homes of millions of people. This Water Fund is innovative because it would be the first trinational financial mechanism in Latin America and the Caribbean.

ESCALAR Project Advances in Scaling Solutions for Adaptation in the Dry Corridor of the Trifinio Zone

- ESCALAR aims to increase resilience to climate change by scaling agricultural innovations that allow better climate adaptation in agriculture, relying on the development of rural businesses led by youth from socially, environmentally, and economically vulnerable communities in high-priority areas of the Dry Corridor of El Salvador, Guatemala, and Honduras, with an emphasis on the Trifinio dry corridor.
- It is expected that in the long term, these actions will impact the reduction of migration.
- Promotion of 8 packages of Agricultural Innovations for Climate Adaptation and the establishment of 16 learning farms for these innovations; 435 families (37% led by women) implement agricultural innovations, and 110 young people are trained to strengthen or create rural businesses linked to scaling agricultural innovations for adaptation in Trifinio.

CATIE consolidates as a key research partner in the Global Environment for Development (EfD) Network

- This network includes 13 centers of excellence in environmental economics research around the world.
- The EfD receives funding from ASDI and is coordinated from the University of Gothenburg.
- In partnership with universities in the United States and Europe, as well as other centers in the Network, this year CATIE led the advancement of comparative medium and long-term scientific research involving countries in Latin America, Africa, and Asia.
- This research demonstrates the importance of using economic incentives for designing public policies to improve water management in scarcity scenarios and to promote more sustainable and inclusive food systems in member countries of the Global South.

- Advances in this research were successfully presented and discussed at the annual EfD conference in Accra, Ghana, which brought together about 200 researchers, representatives of international organizations, and government actors, among others.

What's coming for 2024

Announcement of the "International Sustainable Agribusiness Event 2024." From November 4 to 6, 2024, the most important sustainable agribusiness event in Latin America and the Caribbean will take place at the CATIE campus in Turrialba, Costa Rica. The event aims to be the main platform for presenting, collaborating, and promoting innovative and sustainable practices in agribusiness management, promoting the establishment of strategic alliances, and meaningful connections with sector leaders, fostering professional updating, etc. The target audience includes professionals and entrepreneurs linked to agribusinesses, MSMEs, private companies, public entities, academia, non-governmental organizations, among others. Among the topics to be addressed are: applied artificial intelligence, agriculture 4.0, emerging markets, consumption trends, new financing models, digital marketing, among others.

Leading role in the EfD Annual Conference 2024 in Nairobi, Kenya. This conference will be held in Nairobi, Kenya, and CATIE will play a leading role due to its leadership in the collaborative program SCOPE (Sustainable Consumption and Production), which also includes research centers in India, Chile, South Africa, and Vietnam, in addition to Wageningen University. The conference will bring together 200 people, including researchers from various top universities in the United States and Europe, representatives of international cooperation organizations, and government actors, among others.

Sustainable Livestock Farming and Environmental Management

The year 2023 has been marked by an interdisciplinary approach and the dedication of a committed group, supported by strategic partners and key alliances in the region. With the same hope and determination, the Livestock and Environmental Management Unit looks forward to continuing its work in 2024.

Global impact: leading the transformation in sustainable livestock farming

- › **Innovation and leadership in international research forums:** Participation and leadership in innovative research, making a presence in international forums such as the Latin America and the Caribbean Climate Week (LACCCW 2023) held in Panama City and the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) held in Dubai, United Arab Emirates.

- › **Key ally in sustainability:** Consolidation as a fundamental ally of the Food and Agriculture Organization's Global Agenda for Sustainable Livestock (GASL) in promoting sustainable livestock practices globally. Hosting webinars with global experts to drive significant changes in meat and milk production practices and active participation in the GASL global meeting in Thailand.
- › **Influential presentations:** Showcase at the GASL Global Meeting in Thailand of research and posters focused on interinstitutional arrangements and tree cover dynamics in Mexican livestock areas.
- › **Educational impetus and effective change for setting standards in livestock sustainability:** Based on the analysis of inputs generated by CATIE and global discussions with world experts, progress is made in promoting sustainable livestock practices globally to re-define a productive sector addressing new environmental, technological, and socio-economic challenges, catalyzing a significant shift in meat and milk production practices towards sustainability.



Regional impact: advances in promoting sustainable livestock farming

- › Key Participation in Forums on Sustainable Livestock Farming, emphasizing the importance of tree cover.
- › Development of innovative tools for estimating biomass and carbon in living fences.
- › Implementation of initiatives to operationalize climate financing through public-private partnerships.
- › Strengthening livestock farming with a policy action plan towards increased competitiveness and sustainability by 2028.
- › Generation and dissemination of methodologies for reducing greenhouse gas emissions linked to national priorities.
- › Capacity strengthening for sustainable practices and silvopastoral systems linked to the implementation of water harvesting technologies and practices.
- › Training in Latin America: Significant results in strengthening the capacities of key sector actors through the use of participatory methodologies such as Field Schools (ECA); involving various key sector actors, establishing demonstration plots and pilot farms, and undertaking actions with a gender and inclusion focus, in countries in the region such as Mexico, the Dominican Republic, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Ecuador, and Peru.

Impact in Honduras

- › In September, the start of the project "Transformation of the Honduran Livestock Sector towards a Low-Carbon Economy" was signed in Tegucigalpa.
- › Project implemented by SERNA and SAG, with technical support from CATIE-GAMMA and funding from the Mitigation Action Facility.
- › Aims to contribute to the reduction of 499,252 tonCO₂, aligned with Honduras' NDC and SDGs; direct benefit to 1,200 beneficiaries (30% women) and 3,600 indirect; improvement of extension programs, market access, and climate financing for innovative practices; and the creation of a Knowledge Management and MRV platform for Greenhouse Gas Mitigation actions.

Impact in Costa Rica: support to the livestock sector

- › **Strategic action plan:** Design of the Action Plan for the Sustainable Livestock Strategy 2023-2028.
- › **Strengthening of alliances:** Strategic collaboration with chambers, universities, guilds, cooperation agencies, public and private institutions, and participation in the National Livestock Table.
- › **Comprehensive approach to sustainability challenges:** Comprehensive management of challenges in production, transformation, commercialization, and consumption in meat and milk chains.

5 500 livestock families
250 pilot farms
280 Field Schools
28% gender participation

Gender and Social Inclusion

The Division of Inclusive Green Research and Development (DIDVI), the Education Division, and the National Offices (NO) lead the update and application of CATIE's Gender Policy. They focus on integrating and mainstreaming gender, equity, and inclusion approaches into all daily activities at CATIE. This commitment is especially reflected in research processes, capacity-building, and the implementation of external projection projects.

Priority approaches: gender, youth, and indigenous peoples

Our strategy combines education, research, and outreach to ensure equitable access to opportunities for women, men, youth, and indigenous peoples. Recognizing the persistent gender gap in many countries, including our Latin American and Caribbean region, we have focused our efforts on training, capacity-building, and awareness. These actions involve the CATIE family, as well as the teams of our partner institutions and organizations, and the general population.



Scientific publications 2023

- › 23 Articles in scientific journals
- › 54 Theses
- › 19 CATIE Seal Publications with ISBN
- › 1 CATIE Seal Publication without ISBN

Most sought-after CATIE authors according to Google Scholar

- › Fernando Casanoves
- › Muhammad Ibrahim
- › Bryan Finegan
- › Eduardo Somarriba

Source: Orton Memorial Library

The 10 most sought-after publications from the CATIE Repository

- › Escalamiento de innovaciones en el sector agropecuario. Reflexiones a partir de la experiencia del Proyecto Biodiversidad y Paisajes Ganaderos Agrosilvopastoriles Sostenibles (BioPaSOS)
- › Lecciones aprendidas en la construcción de gobernanza colaborativa para la promoción de ganadería sostenible en el estado de Jalisco
- › Buenas prácticas ganaderas para contribuir a la implementación de sistemas ganaderos sostenibles en la Amazonía Ecuatoriana
- › Análisis de la participación de actores relevantes del sector forestal en los procesos de reforma de políticas y normativas forestales en Honduras y Guatemala
- › Gobernanza colaborativa en la toma de decisión vinculada a la promoción de ganadería sostenible
- › Prácticas administrativas para contribuir a la implementación de sistemas ganaderos sostenibles en la Amazonía Ecuatoriana
- › El rol de la coordinación institucional entre las Secretarías de Agricultura y Ambiente para la promoción de una ganadería sustentable que contribuya a las ambiciones climáticas del

estado de Chiapas, México

- › Plan de Acción Estrategia de Ganadería Sostenible para las cadenas productivas de carne y leche 2023 – 2028
- › Sondeo rápido de mercado para productos de ganadería bovina sustentable en los estados de Jalisco, Chiapas y Campeche
- › Cadena productiva de carne bovina en el estado de Jalisco, México

The 10 most viewed articles by CATIE authors in other scientific journals

- › An Improved Framework for Estimating Organic Carbon Content of Mangrove Soils Using loss-on-ignition and Coastal Environmental Setting
- › Patterns of shade plant diversity in four agroforestry systems across Central America: a meta-analysis
- › Assessing Potential Effects of Nature-Based Solutions (NBS) on Water Ecosystem Service in the Interurban Micro-Watershed Río Torres, Costa Rica
- › Effects of agro-forestry systems on the physical and chemical characteristics of green coffee beans
- › Enteric Methane Emissions in Dairy Cows with Different Genetic Groups in the Humid Tropics of Costa Rica
- › Structure, diversity and the conservation value of tropical dry forests in highly fragmented landscapes
- › Leaf functional traits and pathogens Linking coffee leaf rust with intraspecific trait variation in diversified agroecosystems
- › Influence of Fermentation Time on the Chemical and Functional Composition of Different Cocoa Clones from Southern Colombia
- › An assessment of silvopastoral systems condition and their capacity to generate ecosystem services in the Colombian Amazon
- › How Ecological Characteristics of Seasonal Migratory Species Influence Conservation Threats and Policy Needs



Acknowledgments and awards for CATIE

These achievements and recognitions highlight CATIE's excellence and positive impact in various national and international spheres during the year 2023.

Global Cooperation Award in Agricultural Technologies for Rolando Cerda:

- › Presented by the Korean Ministry of Food and Agriculture Cooperation.
- › Recognizes the outstanding work of researcher and professor Cerda in coffee and cacao research and development projects in Latin America and the Caribbean.

CONNECTA Central America Pitch Fest for Green Xpo Lab and InnoBovino:

- › ACTIVA-CATIE program projects secure first and second place in the CONNECTA Central America Pitch Fest.
- › Recognition for Green Xpo Lab and InnoBovino in the field of rural innovation.

SACHA Award for CATIE professors and alumni as mentors for climate action:

- › Bryan Finegan, Ronnie de Camino, Jhonny Méndez, and Tatiana Espinosa recognized for their commitment to climate action.
- › Prestigious award honoring leadership in climate-related issues.

CATIE Graduates in Prominent Roles in Latin American Universities:

- › Juan Rosa Quintanilla, Rector of the University of El Salvador.
- › Edgar Fernando Talavera, Dean of the Faculty of Agriculture and Veterinary Medicine at the Bolivian Evangelical University.
- › Celebration of the success of graduates carrying CATIE's knowledge and values.

CATIE Recognized as the Second Best University in Costa Rica:

- › Positioned second among 29 universities in the AD Scientific Index 2024.
- › Recognition for academic and research excellence.

AOAC International Journal Recognition for CATIE Researcher:

- › William Solano, CATIE researcher, co-author in articles recognized for scientific excellence by the journal.
- › Distinguished for contributions to coffee research.

Recognition from the Agroforestry Network of Universities in Colombia to CATIE:

- › Tribute for 50 years of agroforestry education and research in the Americas and the Caribbean.
- › Presented at the University of Valle, Meléndez campus in Cali, Colombia.

Tribute from the Korean Ambassador to CATIE at the Latin American-Caribbean Cocoa Forum:

- › Mr. Jinhae Kim, Ambassador of Korea to Costa Rica, pays tribute to CATIE for its 50 years.
- › Notable recognition at an international cocoa event.

Deputy Minister of Human Development of Belize, a CATIE Graduate:

- › Affairs of Belize, visited CATIE.
- › A graduate of the Master's in Environmental Socioeconomics in 2009.

Tribute from the Cheese Fair to the CATIE Director-General:

- › Muhammad Ibrahim, CATIE Director-General, received a special tribute during the 2023 Cheese Fair.

- › Honored with the task of cutting Costa Rica's largest cheese.

Declaration as Honorary Citizen of the City for Dr. Muhammad Ibrahim:

- › The Municipal Council of Turrialba declares Dr. Muhammad Ibrahim as an Honorary Citizen of the City.
- › Recognition in a special session of the Municipal Council.

Tribute from the National Lottery to CATIE on its 50th Anniversary:

- › National Lottery pays tribute to CATIE with a commemorative ticket for national sale.

Recognition from the San Buenaventura Nursing Home in Turrialba to CATIE:

- › Thanks to CATIE for its continuous support and assistance to the mission of the San Buenaventura Nursing Home.



External Outreach: Knowledge Management in Member Countries

The following projects showcase our ongoing commitment to innovation, sustainability, and the improvement of living conditions in the region, positioning CATIE as a leader in the quest for comprehensive solutions to the climatic and agricultural challenges of Latin America and the Caribbean.

Honduras

Project	Objective	Achievement
<p>Transforming the Honduran livestock sector into a low carbon economy. MAF - Livestock - Hn</p> <p>Funded by the Mitigation Action Fund (MAF), and executed jointly with stakeholders in the country's cattle sector, with the leadership of SAG and SERNA, and the technical-scientific support of CATIE (2023-2027).</p>	<ul style="list-style-type: none"> The livestock sector in Honduras is being transformed to a low-carbon, climate-resilient and profitable pathway, thus contributing to the NDC and SDG targets. It is intended to directly benefit 1,200 producer families, and more than 3,600 indirectly, in the most livestock-producing areas of the country; however, through the financial mechanism, the knowledge management platform, and the alignment of actions with implementing partners, it is intended to reach more than 55,000 producer families linked to the country's market. 	
<p>Use of nature-based solutions to increase resilience to extreme climate events in the Caribbean region of Central America.</p> <p>Financed by the Adaptation Fund with CABI administration, and executed by partner organizations, CATIE and WRI (2022-2027).</p>	<ul style="list-style-type: none"> More climate-resilient communities and ecosystems, through nature-based restoration that mainstream gender, cultural relevance and youth. The project will directly benefit 2,050 people directly and more than 35,000 indirectly in the Atlantic coastal region of Honduras, Belize and Guatemala. 	
<p>Wooded pastures and good livestock husbandry practices to favor migratory birds.</p> <p>Funded by American Bird Conservancy (ABC) and implemented by CATIE and local partners (2022-2023).</p>	<ul style="list-style-type: none"> Increased tree cover and diversity on cattle farms in Olancho communities. 	<ul style="list-style-type: none"> Nine established demonstration farms where various livestock technologies have been tested, and from where results and experiences have been shared with other producer families and stakeholders in the area.

El Salvador

Project	Objective	Achievement
<p>Elaboration of Climate Change Adaptation Plans (PDA's) for Small Producers' Organizations (OPPs) of coffee and sugar cane in El Salvador. CATIE-CLAC. 25-10-2022 / 24-01-2023</p>	<ul style="list-style-type: none"> • Six climate change adaptation plans, specific to each organization. • Six validated climate change adaptation plans for coffee and sugarcane products in the target region. • Master Plan, which will serve as a roadmap for the implementation of the six climate change adaptation plans, specific to the target region for each of the participating organizations, prepared. • Development of workshops with the selected PPOs to complement information and socialize on issues such as institutional capacity and available resources, among others. • Development of workshops with the technicians of the selected PPOs to learn about the adaptation actions to be prioritized in a context of climate change. 	<ul style="list-style-type: none"> • Evaluation of the challenges of climate change, by combining technical information, meteorological data, climate scenarios, records, and experimental evidence from smallholders, based on: • Adaptation planning, where climate change adaptation options are selected and structured under an intervention scheme. • An Operational Plan was formulated and implemented (detailed measures for implementation, resources and deadlines for each task). • The necessary support was obtained to facilitate the development of indicators for monitoring and evaluation of the results of the adaptation measures. • Follow-up meetings were held with the Climate Change Program and Country Manager El Salvador.
<p>Systematization of guidelines contained in climate change adaptation plans (CAPs) for coffee in Latin America and the Caribbean. CATIE-CLAC. 22-11-2023 /21-04-2024</p>	<ul style="list-style-type: none"> • Design of systematization tool: Definition of the methodology to be used for the systematization of recommendations from the Climate Change Adaptation Plans, which may include interviews with producers, review of documents and records, field visits, among others. At the same time, a questionnaire should be designed to prioritize and group the recommendations emerging from the climate change adaptation plans. • Report of recommendations: A report synthesizing the recommendations found to improve with guidance on improving the effectiveness of climate change adaptation plans, along with guidelines in roadmap format, to guide the UPS and UCC technical team, in the implementation of PDAs. • Training and education: Establish a training plan and its respective methodology emerging from the PDAs, which will guide the process of building skills in the OPPs by the UCC and UPS. 	<ul style="list-style-type: none"> • Climate change adaptation plans for coffee were compiled, both from CLAC and from different external sources. • The common themes addressed in the different adaptation plans were identified, trying to identify contexts of geographic proximity. • The proposed adaptation measures were identified and prioritized, trying to group them by categories/themes (for example: productive-agricultural limitations, water, climate vulnerability, etc.). • The potential impact was established to define the potential effectiveness of adaptation measures at the category/theme level, taking into account different criteria, focus of the intervention, potential impact, cost, feasibility, sustainability, acceptability, etc. • In the context of sustainable coffee production, cost-effectiveness can be an important factor to consider when evaluating different climate change adaptation practices and measures.

Dominican Republic

Project	Objective	Achievement
Proposal submitted to the National Agricultural and Forestry Research Council (CONIAF), entitled "Economic impact of cost-effective strategies to increase the resilience of the Dominican cocoa subsector to a possible arrival of monilliasis"		<ul style="list-style-type: none"> Approved

Peru

Project	Objetivo	Logro
Strengthening of technical, organizational, entrepreneurial and commercial capacities for sustainable business within the scope of the PIP 02 of the FIP/BM" CATIE-CEDIA-PNCBMCC-MINAM	<ul style="list-style-type: none"> Development of simplified methodologies for the participatory formulation of ideas and business plans by native Amazonian communities. Development of an improved methodology to strengthen the capacities of native communities using an intercultural approach and appropriate to the Amazonian reality. 	<ul style="list-style-type: none"> Training of more than 2,500 native community members from 26 communities of six ethnic groups (Asháninka, Ashénin0ka, Shipibo, Shipibo-Konibo, Yine, and Yine-Asháninka) in the formulation of ideas and sustainable business plans. Training of more than 2,500 native community members from 26 communities of six ethnic groups (Asháninka, Ashénin0ka, Shipibo, Shipibo-Konibo, Yine, and Yine-Asháninka) in the formulation of ideas and sustainable business plans. A business roundtable implemented with more than 76 value chain actors Implementation of a dialogue of knowledge between 26 local trainers and 7 CATIE officials on topics related to business plan management, agroforestry systems with coffee and cocoa, forest management and sustainable tourism. First training day for native communities with the participation of 60 representatives (29% women) from 27 communities, focused on organizational development, marketing, good production practices, administration and accountability, carried out in a playful and participatory manner. Participatory preparation of 24 business plans: 20 in agroforestry systems with cocoa, coffee and plantain; two in tourism and two in timber products. Six business ideas developed in a participatory manner with six native Amazonian communities in Atalaya.
Capacity building for the intensification of sustainable livestock production in priority areas of the departments of Ucayali and Huánuco, Peru CATIE-MINAM-MIDAGRI-PNUD		<ul style="list-style-type: none"> 250 cattle ranchers trained in silvopastoral systems and good management practices through 14 field schools. 14 prototype farms to demonstrate the benefits of livestock intensification. Beneficiaries recognize the management of natural regeneration of scattered trees in pastures as an economical and viable tree planting strategy. In the prototype farms, more than 4 water catchment systems have been designed as alternatives to install water troughs in paddocks and corrals. Non-monetary incentives have been delivered to 250 livestock farmers consisting of electric fencing kits, rolls of barbed wire, calaminas, mineral salts, water tanks, among others.

Project	Objective	Achievement
Latin American Model Forest Network in Peru: Pichanaki, Villa Rica, Rio Abiseo Huambisa and Abanca. CATIE-Canada-Community Model Forests		<ul style="list-style-type: none"> • Conduction of the international forum: effective and participatory governance for climate change adaptation and mitigation in the Pichanaki Model Forest - Bosques De Neblina Selva Central Biosphere Reserve. • Holding of the I International Forum: Effective and participatory governance for climate change adaptation and mitigation in the Villa Rica Model Forest - Oxapampa Ashaninka Yanesha Biosphere Reserve. • Training of 25 scholarship participants from Peru in the Virtual Training Program: Sustainable Business as a Forest Landscape Restoration Strategy, with 73 participants (39 women and 34 men from 7 countries). • Three Peruvian graduates completed the master's degree (two women and one man). • Two Peruvian professionals were awarded scholarships, financed by the Government of Canada, to pursue master's degrees at CATIE in Forest and Biodiversity Management, and Economics and Development and Climate Change, respectively.

Bolivia

Project	Objective	Achievement
Strengthening institutional capacities for the management of climate finance in the Plurinational State of Bolivia. CATIE-FAO Bolivia	<ul style="list-style-type: none"> • CATIE has strengthened the capacities of national stakeholders in climate finance through the exchange of information, technologies and experiences. • The course designed to strengthen capacities in climate finance management was successfully carried out, contributing significantly to the development of key skills. 	<ul style="list-style-type: none"> • A total of 27 participants, occupying important roles in ministries, directorates and financial entities, now have a deep understanding of climate finance management. They have acquired specific skills for the formulation of proposals that fit various sources of climate finance.
Specialized training in Biostatistics CATIE-CIAT		<ul style="list-style-type: none"> • Two biostatistics courses successfully implemented, contributing significantly to improving the knowledge, skills, and key abilities of the participants. • A total of 28 professionals responsible for CIAT research projects (8 women and 10 men) have acquired specific competencies that respond to the needs of the agricultural sector at the national level.

Colombia

Project	Objective	Achievement
Program to support Colombia in the implementation of its NDCs - Strengthening of MRV and M&E systems. 2020 - 2023 AMBERO - CATIE		<ul style="list-style-type: none"> • Accompaniment in the generation of the BTR action plan for the AFOLU sector for Colombia. • Accompaniment in the strengthening of Colombia's MRV system.
Improving cocoa production through the use of improved germplasm and climate-smart agriculture practices". Network of Demonstration Plots-research. CATIE-KOLFACI National Partner: AGROSAVIA		<ul style="list-style-type: none"> • AGROSAVIA technicians and researchers have capabilities in research with cocoa germplasm; silvopastoral systems.

Guatemala

Project	Objective	Achievement
National Information Platform on Nutrition (PINN - Phase 2) CATIE-UE-CONASAN-SINSAN-SESAN		<ul style="list-style-type: none"> • 340 (100 %) of municipalities in Guatemala carry out quarterly monitoring of FNS governance. • Eight multi-sectoral municipal and one departmental FNS information systems implemented and functioning. • 583 public officials trained in data analysis, interpretation and use. • Nine health districts use a situation room application for data analysis. • Six mobile and web applications strengthen the national food and nutrition security information system. • Report on public spending on food and nutritional security at the municipal level. • Study on the evolution of chronic malnutrition reduction strategies in Guatemala.
Landscape connectivity and livelihoods in four municipalities in region 3 of the CATIE-UNDP-municipalities-INAB-MAGA volcanic chain project.		<ul style="list-style-type: none"> • Formation and participation of 10 Field School groups (ECA) in seven communities. • Generation of farm plans in plots of 135 families to guide the project's technical assistance and empowerment. • Direct dialogue with municipal authorities in San Pedro Yepocapa, Chimaltenango for field evaluations and cost-benefit analysis of the financial sustainability of the Joya Grande Regional Municipal Park. • Implementation of activities for the creation of ECAs, studies and technical analysis with governmental entities (INAB and ICTA) in four municipalities. • Through training processes, 31 people (20 women and 11 men) have been trained in the methodology of field schools and farm plans.

Project	Objective	Achievement
Strengthening the Transparency Framework through National Capacity Building to implement the Paris Agreement in Guatemala (CBIT). CATIE-UNDCP-MARN		<p>Integration of:</p> <ul style="list-style-type: none"> • Project Board: CATIE-UNDP-UNDP-MARN • Technical Advisory Committee: CATIE-UNDP-UNDP-MARN-MINFIN-SEGEPLAN-MICC-SGCCC • Initiation of the process for the design and implementation of: <ul style="list-style-type: none"> • An MRV system to improve the calculation of Greenhouse Gas Inventories (INVGEI). • A system for monitoring the mitigation component of the NDC, designed and implemented. • A monitoring system for the adaptation component of the NDC. • A monitoring system for the support component provided and received from the NDC. • Initiation of the process to integrate the MRV component into the Sectoral Technical Tables on climate change.

Panama

Project	Objective	Achievement
Maintenance of the system implemented in riparian reforestation and agroforestry with coffee and soil conservation systems in the Caisan river sub-basin, Renacimiento, Chiriquí, Panama. CATIE- MIDA/ Natura-Adaptation Fund.		<ul style="list-style-type: none"> • 25 producers continue working with the project initiated in 2020, 14 of them are women. • Technical follow-up in the field, between five and eight visits per farm, addressing aspects of pests and diseases, fertilization and shade management mainly. • Increase of 14% of the initial hectare age of agroforestry systems with coffee, through the initiative and resources of the producers. • Production per ha in these project plots is projected to be between 50 and 60 q per ha by 2024. (The average in the area is 21 q per ha and 10 q the national average). • Strengthening of the coffee germplasm bank of the Instituto de Innovación Agropecuaria de Panamá (IDIAP) with the shipment of 49 accessions from the core coffee collection of CATIE. • Continued to strengthen coffee variability in the area with the shipment of 8,000 coffee hybrids (Milenio and Esperanza) to reinforce the 19 farms in the area that are working with six coffee hybrids produced at CATIE. • Support for the Ministry of Agricultural Development (MIDA) in the development of field workshops (two) on climate change and agriculture for coffee and bean producers.

Project	Objective	Achievement
Formation of the National Cocoa Agro-Chain of Panama. Led by MIDA		<ul style="list-style-type: none"> CATIE participated in workshops for the mapping of actors and actions that can integrate Panama's cocoa agro-chain. It was agreed to establish the national cocoa platform, a technical committee and work on the operational plan. Currently there is a group of organizations that are part of different links and that are applicants for the conformation of the agro-chain.
Consultancy for the elaboration of the environmental awareness and education plan for the sanitation program. Funded by the Ministry of Health. Coverage Panama and West Panama Provinces	<ul style="list-style-type: none"> Projects initiated in the last quarter of the year 	
Elaboration of a Detailed Diagnosis, Territorial Environmental Management Plan and Management Plan for the Santa Bárbara River Basin, between Santa Bárbara and Chucunaque (152). Funded by Asociación Nacional para la Conservación -ANCON- Coverage, Watershed 152 is located in the province of Darien.	<ul style="list-style-type: none"> Projects initiated in the last quarter of the year 	

Nicaragua

Project	Objective	Achievement
Adaptation of Agriculture to Climate Change through Water Harvesting in Nicaragua Project (Final phase Nov-2022-Dec 2023) USD 2,000,000.00		<ul style="list-style-type: none"> Transformation of the productive systems of the families of the dry corridor, through the availability of water by means of the construction of 202 water harvesting works, allowing the storage of some 200,000 m3 of water to be used for rescue irrigation in agricultural activities and watering livestock. This action in turn contributes positively to the water balances of the watersheds in the Las Segovias region and as connectors between natural corridors for biodiversity because they are important resting sites for birds. In a study carried out by the project, 41 families and 150 species of birds were recorded in the dry and rainy seasons, representing 20% of the birds reported for Nicaragua.
Strengthening the resilience of rural families in Nicaragua in the face of climate change with a focus on rights and gender. From May to December 2023. USD 51,000 executed jointly with ONGAWA.		<ul style="list-style-type: none"> Identification, delimitation and characterization of water recharge areas of sources for human consumption in three micro-watersheds, located in the upper part of the Inalí river basin, in the municipality of Las Sabanas, which will allow the development and implementation of management plans and strengthen the capacity of families to adapt to the effects of climate change in areas related to water, sanitation, food production and education.

Project	Objective	Achievement
<p>Anticipating the Impacts of Agricultural Drought in the Dry Corridor of El Salvador, Guatemala, Honduras, and Nicaragua (July - December 2023) USD 63 000</p>		<ul style="list-style-type: none"> • Through this project, work was carried out on capacity building and technical assistance to beneficiaries for the establishment of roof water collection systems and the distribution of technological packages in 40 communities in the municipalities of Mozonte, Telpaneca, Totogalpa and Pueblo Nuevo, within the framework of the implementation of the Emergency Project "Anticipating the Impacts of the Agricultural Drought in the Dry Corridor of El Salvador, Guatemala, Honduras and Nicaragua (SFERA). • This action has strengthened the socio-productive conditions of 680 families by providing inputs and seeds, as well as feed for small livestock. • 80 roof water harvesting works were built, benefiting an equal number of families, contributing to the temporary provision (four months) of at least 960 m³.
<p>Design and implementation of a program to strengthen the capacities of the institutions of the National System of Production, Consumption and Trade for the development of an innovative, sustainable, low-carbon and climate-resilient cattle production model. From March to June 2023. USD 31,600. Executed with FAO</p>		<ul style="list-style-type: none"> • Technicians from the Production, Consumption and Trade System were trained in six key topics for developing sustainable, low-emission livestock production.

General summary of activities of CATIE National Offices in member countries

During the year 2023, CATIE's National Offices in member countries played a fundamental role in strengthening the institution's presence and impact at the regional level. The actions carried out focused on various aspects, highlighting the following key points:

Positioning and institutional participation

- › Strategic actions to consolidate CATIE's presence in sustainable production and governance issues. Active participation in governance platforms, ministerial councils, and sectoral events to increase institutional visibility.

Technical and administrative support

- › Technical support to ministries of agriculture and environment in areas within CATIE's expertise. Strengthening of national platforms, such as the National Platform for Sustainable Livestock in Honduras.

Project management and cooperation

- › Coordination and support in the execution of CATIE projects at the national level. Exploration of opportunities and signing of agreements to ensure institutional positioning.

Dissemination and promotion

- › Publication on social networks of highlighted actions and administrative and technical reports. Promotion of CATIE and its academic offerings to national stakeholders, as well as participation in events and interviews.

National and international cooperation

- › Identification and exploration of cooperation opportunities with national and international institutions. Participation in regional academic/scientific networks and collaboration with international organizations.

Facilitation of information and analysis

- › Facilitation of information between headquarters projects and national offices. Continuous analysis of national trends and priorities to guide CATIE's actions.

Legal updates and strategic alliances

- › Maintenance of CATIE's legal status in specific countries. Strengthening of strategic alliances with state, academic, and private sector institutions.

Promotion of research and training

- › Dissemination and promotion of CATIE's technical and scientific publications. Promotion of training and research actions through strategic partners and academic networks.

These activities reflect CATIE's commitment to contributing to sustainable development in the region by establishing strong collaborations, strengthening its institutional presence, and promoting research and training on crucial topics for the well-being of member countries.

Institutional Development

Administration and Finances

In the fiscal year 2023, the financial administration of the institution encountered numerous challenges. Emerging from the aftermath of the pandemic, the Russia-Ukraine conflict, and the global financial crisis induced by inflation in 2022, an intrinsic economic occurrence in Costa Rica led to a significant appreciation of the colon by over 20% relative to the dollar.

For entities like CATIE, which derive a substantial portion of their income in dollars while incurring most expenses in colones, this exchange rate fluctuation posed a considerable threat.

In response, CATIE proactively initiated a series of measures designed to safeguard the financial stability of the institution without compromising the execution of projects funded by donors or resorting to workforce reductions. A systematic methodology

was implemented for continual monitoring of Costa Rica's macroeconomic landscape, accompanied by analytical protocols facilitating judicious decision-making to forestall any direct impact on the institution's financial well-being. These measures resulted in an increase of CATIE's core budget, and a positive finance balance at the end of the physical year of 2023.

Financial Information System

While 2023 marked a transitional phase from the former financial information system to the new Softland system, the migration process remains ongoing. Nevertheless, stringent financial controls have been consistently upheld, particularly concerning cash flows, to ensure that the institution's accounts maintain positive balances.

CATIE's financial administration has, above all, prioritized accountability to donors regarding resource utilization. The full implementation of Softland's new financial information system is anticipated to be completed during the course of 2024.



Green Businesses and Strategic Alliances »

CATIE's Directorate of Business Development, Resource Mobilization, and Strategic Alliances has played a crucial role in effectively leading the comprehensive process of resource and in-come management for the institution during the current year. Despite facing a challenging year due to various circumstances, the most significant milestone achieved is the successful diversi-fication of income.

The continuous commitment to international cooperation, including resources from the Ger-man and Swedish governments, as well as cooperation agencies from the United States and Europe, has been complemented by an increasingly robust approach to strategic collaborations with the private sector.

An additional achievement is the consolidation of direct partnerships with donors, with a prom-inent emphasis on collaboration with Swedish cooper-ation for over two years. This close collab-oration, characterized by joint work, has led to notable projects, such as the Mitigation Action Facility, a global instrument to combat climate change. A concrete example is the \$13 million project initiated in May 2023 to implement mitigation actions in sustainable livestock systems in Honduras, under a co-creation scheme that has strengthened our relationship with donors.

Another notable achievement is the successful partnership with private sector companies, with a particular focus on collaboration with Starbucks. Recently, we have progressed in signing agree-ments to improve coffee varieties and to offer courses and knowledge to small coffee farmers in the region, contributing to more sustainable pro-duction and higher incomes for their families.

The increasingly relevant role of the private sec-tor for organizations like CATIE is evidenced by the consolidation of strategic alliances with global companies, such as Starbucks Coffee, where joint work on genetic improvement and research has surpassed two years of collaboration. This year, we have advanced in discussions to implement training and design actions with agrofor-estry systems specifically for Starbucks-producing farms in 2024.

CATIE, with its prominent position as a leader in cof-fee and cocoa genetic improvement, has become a natural strategic partner, recognized for its scientif-ic richness in coffee collections and laboratory.

Another significant aspect of collaboration has been with Southwest, highlighting its communi-cative and sustainable approach. We have materialized initiatives to reuse and recycle the leather from air-plane seats, changed every 4 or 5 years, in a circular economy. This has not only allowed generating in-come for economically disadvantaged women in



CATIE and other areas but has also become a tool to combat climate change through the production of leather crafts.

These examples illustrate how CATIE establishes strategic partnerships with global brands to positively impact the scientific field.

Despite external challenges such as the COVID-19 crisis, macroeconomic conditions, and international conflicts, CATIE has demonstrated resilience. The knowledge-based strategy, positive echo, and scientific approach have resulted in highly positive outcomes, setting an optimistic outlook for the years to come.

Regarding CATIE's fundraising infrastructure, the creation of the Tropics Foundation has been a significant milestone. This year, we managed to capitalize on fundraising in the American market, supported by the dedicated work of a full-time person based on our campus. Along with the support of the foundation's board in Central America, we are confident of exponential growth in 2024, thanks to our philanthropy strategy.

The Fundatropics Foundation, responsible for the trust at CATIE, has experienced significant strengthening of its governance. In the last two years, a new board of directors has been formed,

marking a more modern vision and venturing into investments in international markets. These actions, along with the diversification of strategies, have increased the profitability of these investments, contributing to 10% of the institution's income. Conversations with the board indicate the intention to increase the heritage to further raise investment returns.

Other notable actions carried out in 2021, strengthened in 2023, include collaborations with universities to capitalize on the post-pandemic trend, where students show growing interest in exploring other places. Collaboration with Verto, bringing 300 students to Costa Rica each year, has been valuable, not only providing knowledge about tropical production and conservation conditions but also becoming a strategic resource for CATIE.

2024 presents itself as a challenging year, focusing on income generation. The plan is to further strengthen collaboration with the private sector and seek autonomy in income management for greater flexibility and financial stability. The office will be dedicated to addressing these challenges, and CATIE, with its capacity, knowledge, and experience, is fully prepared to face them and make a positive impact on the region, fulfilling its mission decisively.

Support to CATIE through Friends of CATIE

The Tropics Foundation and CATIE created Friends of CATIE, a platform for engagement and fundraising that supports CATIE's strategic plan and is dedicated to addressing social and environmental challenges in the current Latin American region. The platform has three objectives: building community and engagement, seeking crucial philanthropic support for the Center's strategic initiatives, and sharing CATIE's defining principles and its impact on the world.

50-year goal USD 50,000

All donations to Friends of CATIE are critically important for the successful implementation of sustainability projects in Latin America and the Caribbean. To date, there are more than 3000 alumni worldwide working on policy changes and community projects ensuring a future for future generations.

Forest Seed Bank and Coffee Propagation Module »

The Forest Seed Bank, an integral part of CATIE's business activities, has experienced a year in which it has consolidated its operations at the regional and international levels. From the sale of forest seeds to the development of new ventures and innovative projects, the bank has contributed to sustainable advancements in agroforestry.



Regional sales and training

- » Distribution of 8,000 kg of seeds to 292 clients in 28 countries, strengthening global sales.
- » Revitalization of training in collaboration with the U.S. Forest Service and the Department of State to enhance the capacities of forest seed banks in the Central American and Caribbean region.
- » Projection to reactivate the network of forest seed banks to address challenges in restoration projects in the future.

- » **Coffee propagation module:**
 - Objective to increase the installed capacity to produce at least one million annual plants of F1 hybrids and other coffee varieties, including the outstanding Geisha from the International Coffee Collection.
 - Participation of 137 producers in 2023, with a total production of 220,540 F1 hybrid and coffee variety plants.

- » **Emerging businesses and reactivation of La Lola:**
 - Leadership in the development of new ventures, with an emphasis on creating and strengthening own brands of coffee and cocoa.
 - Reactivation of La Lola farm with projects for the production of natural fibers (Abaca and Jute) in collaboration with the private sector, promoting replicable and scalable business models.
 - Launch of commercial projects in collaboration with Zucobisa and Guri Alejandría, applying exponential technologies in water and the agricultural sector.

IICA-CATIE Investment Fund ›

Successful technical cooperation with IICA and sustainable investment projects

- › The Interamerican Institute for Cooperation on Agriculture (IICA) and the Tropical Agricultural Research and Higher Education Center (CATIE) consolidate a successful technical collaboration.
- › Investment fund: Both institutions work together with the investment fund.

Strategic investments of the investment fund in 2023

Renewable energy and energy efficiency project

- › Development of the third investment round.
- › Modernization of equipment, such as replacing air conditioners over 30 years old, generating efficiency and reducing the ecological footprint.
- › **Tangible Result:** Significant reduction in the institution's electricity bill.

Coffee hybrids propagation

- › Contribution to the sustainable strengthening of the coffee sector.
- › Implementation of innovative agricultural practices.

Sustainable dairy production

- › Focus on sustainable agricultural practices for the dairy sector.
- › Improvement of efficiency and reduction of environmental impact.

Multiplication of resources through the IICA-CATIE initiative

- › Strategy to maximize resources allocated through sustainable business models.
- › Reduction of dependence on traditional implementation budgets.
- › Success example in energy, coffee, and dairy production projects, demonstrating the effectiveness of this strategy.

This synergy between IICA and CATIE represents a proactive approach to innovation and sustainability, generating positive impacts on technical and financial development. The investment strategy in sustainable business models demonstrates efficient resource management to achieve multiple benefits and promote sustainable agricultural and energy practices in the region.



Botanical Garden »

The following outcomes from CATIE's Botanical Garden reflect our steadfast commitment to sustainability, environmental education, and biodiversity preservation.

Visitation

The Botanical Garden has experienced a noticeable increase in visitor attendance throughout 2023, attracting a diverse audience both nationally and internationally. Visitors from the United States, England, Germany, and France have significantly contributed to the richness of our facilities. Additionally, we have seen a marked increase in educational tourism, with active participation from kindergarten to universities, with the thematic tour "BIODIVERSITY" being the most requested. To date, 4,140 people have visited, with 60% being foreign visitors and 40% national visitors.

Projects and achievements

The constant pursuit of excellence is evident in various projects and achievements that have transformed the Botanical Garden into an even more enriching space. Improvements in the labeling of emblematic species have enhanced the visitor experience, and we plan to expand this effort to a minimum of 200 additional species by 2024.

Creating more welcoming spaces and opening up to collaboration with volunteers and interns, both national and international, has strengthened the connection between the Garden and the community.

Active participation in tourism fairs, promotional events, and film projects has solidified our position as a prominent destination.

In addition, structural improvements in the ranch, investments in maintenance equipment, and a \$1,500 contribution for the cleaning of the CATIE lake demonstrate our commitment to infrastructure and environmental sustainability.

The donation of around 150 plants and trees to local institutions, such as INAMU, IICA, MEP, and the Lions Club of Turrialba, underscores our social and community commitment.



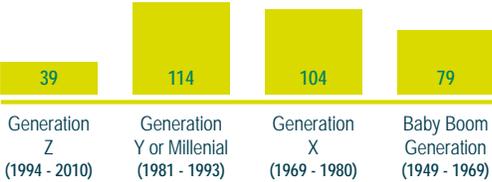
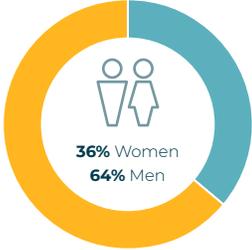
Relevant activities at the garden ranch

In 2023, the Botanical Garden has been the venue for significant events. From charitable collaborations, such as raising ₡1,820,125 for the Turrialba Children's Home in an activity by the Bocaracá group, to workshops and talks by various CATIE units, the Garden has been a meeting point for the academic and local community.

Human Development >

In 2023, there was a 20% increase in the number of young women working at CATIE.

Number of CATIE staff



Staff by work center



Currency change from colones to dollars

Due to the financial loss experienced by the institution due to the exchange rate of the dollar, a bilateral agreement is signed between the CPT and CATIE to change the currency in the national payroll.

Starting from April 2023, the salary payment is established in dollars for all employees with a salary equal to or higher than the salary of a higher education technician according to the Ministry of Labor.

Additionally, 34 documents were updated, including guidelines, policies, and regulations.

Information Technology and Communication ›

During 2023, CATIE carried out a crucial project for its modernization by implementing the Softland ERP financial accounting information system, replacing the obsolete SIIF. This change was essential as SIIF, operational since 1986, posed significant risks due to a lack of technical support, tool obsolescence, and limited adaptability to new technologies.

The adoption of Softland ERP represents a strategic investment for CATIE, aiming to improve efficiency and competitiveness. In 2023, the implementation of 21 modules was achieved, with two additional modules planned for the first quarter of 2024. These modules cover key areas such as finance,

human resources, purchasing, and procurement. The new ERP system offers substantial benefits, enabling the integration of national offices and strengthening their capabilities. The implementation of Softland ERP has improved efficiency in resource and process management, centralizing information and providing a clear, up-to-date view to facilitate decision-making.

Although the implementation was a complex process, the commitment of the CATIE team ensured the system's operability. In the short term, Softland ERP is expected to prove a crucial decision for enhancing the institution's administrative and financial processes.

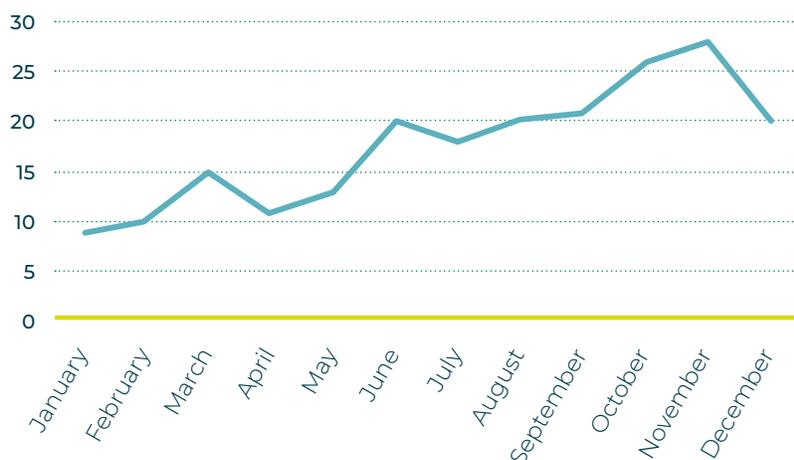


Strategic Communication >

Over the past year, we have witnessed a notable increase in CATIE's visibility, thanks to a greater number of news items related to strategic agreements, internationally relevant visits, innovative projects, scientifically impactful findings, well-deserved recognitions, and enriching training activities.

News about the activities of CATIE

News published on CATIE website



CATIE in the press

Every shared news item has contributed to strengthening CATIE's presence in the international sphere, solidifying our position as a key player in generating knowledge and solutions for contemporary agronomic and environmental challenges.

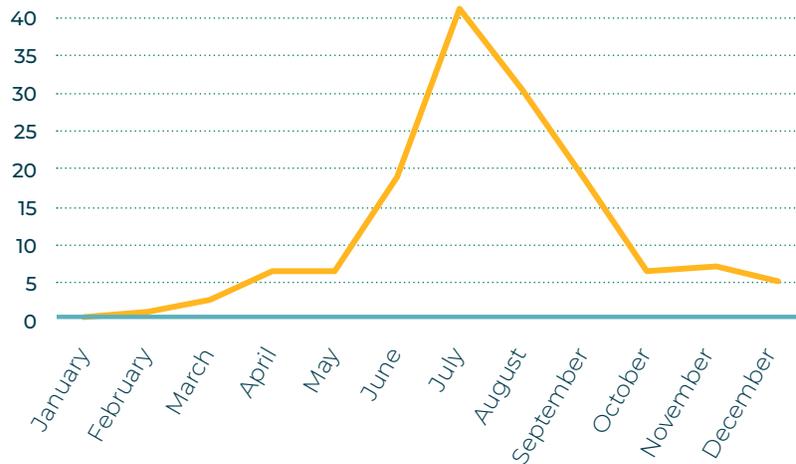
Visit our CATIE in the Press section where we compile all mentions in collective media.

For example, the visit from a team of journalists from the Agence France-Presse (AFP) in August allowed us to showcase the work carried out by the Orthodox Seed Germplasm Bank. The news was translated into English, French, and Portuguese:

Costa Rica Guards a Seed Treasure against Climatic or Food Crises

Turrialba (Costa Rica) (AFP) – [In the heart of the lush mountains of central Costa Rica lies a treasure trove of seeds collected and stored for decades](#) in case they are needed to face food crises or the threat of climate change...

CATIE mentions in the press



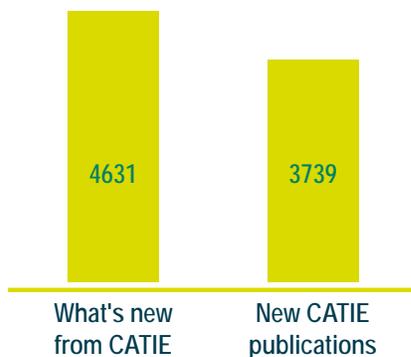
New channels, new formats

Mindful of the importance of diversifying our communication channels, we have launched two specific newsletters on the professional social network LinkedIn.

The first one, titled “What’s New at CATIE,” provides a glimpse into the most noteworthy news about our activities, projects, and achievements.

The second one, named “New CATIE Publications,” focuses on sharing the most recent scientific articles from our researchers, thereby strengthening the dissemination of specialized knowledge on the platform.

Suscriptores a boletines CATIE en LINKEDIN



Expanded social media audience

Facebook 67.1 thousand followers

X 4.3 thousand followers

Instagram 10.4 thousand followers

LinkedIn 10 thousand followers

YouTube 4.43 thousand followers

Our 50th anniversary ›

In 2023, we celebrate 50 years, a period during which the institution has deeply rooted itself in the canton of Turrialba, contributing to its development and realizing its goals of education, research, and outreach.

It was on March 19, 1943, that the canton celebrated with parades, flags, and music the laying of the first stone of what would become the facilities of the IICA (Inter-American Institute for Agricultural Sciences), its predecessor. The president of the republic, Rafael Ángel Calderón Guardia, and Mr. Henry Wallace, Vice President of the United States, who played a decisive role in the creation of an agricultural research institute destined for Turrialba, participated in the activities.

Now, 50 years later, the commitment to sustainable development to increase human well-being and reduce poverty in Latin America and the Caribbean remains alive. And this is how we celebrate:

● **April 22:** Band Parade in Commemoration of the CATIE 50th Anniversary.

- › The campus streets were filled with colorful and exciting sounds of Turrialba's bands.



● **April 29-30:** CATIE International Fair 2023. .

- › A successful event in terms of community participation and fundraising.
- › A total of 20,764,896.23 colones raised and donated to selected institutions and associations.
- › Recreational, sports, cultural activities, and tasting of typical regional foods.



● **May 31 - June 3:**

VIII Wallace Conference.

- › Participation of 170 people from various parts of the world.
- › Focus on six thematic sessions for the transformation of food systems.



● **May 31:** National Lottery Draw in honor of CATIE's 50th Anniversary.

- › Commemorative ticket played in the national lottery draw on June 4.



● **June 29:** Municipal Council of Turrialba declares Dr. Muhammad Ibrahim an Adoptive Son of the City

- › Recognition to the CATIE's Director-General by the Municipal Council.



● **July 8, 9, 16, and 17:** Turrialba Cheese Fair 2023.

- › Special tribute to the CATIE's Director-General for his outstanding role.
- › Muhammad Ibrahim received the honor of cutting the largest cheese in Costa Rica.

● **July 20:** IICA Recognition of CATIE.

- › Honoring CATIE for its work in sustainable agriculture and the environment.
- › Planting of a commemorative tree for CATIE's fiftieth anniversary in the IICA



gardens.

● **August 17:** Solemn Session of the Legislative Assembly at CATIE.

- › Historic session to commemorate the 120 years of the Turrialba canton and the 50 years of CATIE.
- › Acknowledgments presented to deputies and CATIE for its creation in 1973.

● **September 1-13:** Independence Soccer Tournament dedicated to CATIE.

- › Muhammad Ibrahim performed the honorary kick-off to officially start the tournament.

● **September 15:** Independence Torch.

- › In a symbolic act and as a tribute, Dr. Ibrahim received the Independence Torch from a Turrialba student and toured the central park of the canton.

Acronyms

AbE	Ecosystem-based Adaptation
ACOFOP	Association of Forest Communities of Petén
ADI	Indigenous Development Associations
AFD	French Development Agency
AGRICULTURE	Ministry of Agriculture and Rural Development
AGROINNOVA	Agroforestry Systems Adapted for the Central American Dry Corridor
AREDE	Regional Development Agencies
ASDI	Swedish International Development Agency
ATOC	Transboundary Aquifer Ocotepeque-Citalá
BioPaSOS	Biodiversity and Sustainable Livestock Agro-silvopastoral Landscapes
BIO2DIV	Biodiversity, New Diseases, and Management of Health and Phytosanitary Risks
BMFT	Belize Maya Forest Trust
CARICOM	Caribbean Community
CARSI	Central American Regional Security Initiative
CCAC	Clean Climate and Air Coalition
CENPROMYPE	Regional Center for the Promotion of Micro, Small, and Medium-sized Enterprises
CODESOSA	Commission for Sustainable Development of the Sarapiquí River Basin
COMCURE	Commission for the Management of the Reventazón River Basin
CONABIO	National Commission for the Knowledge and Use of Biodiversity
CONACYT	National Council of Science and Technology of the United Mexican States
CONAFLU	National Confederation of Federations, Leagues, and Associations of ASADAS
CONAP	National Council of Protected Areas of Guatemala
CMNUCC	United Nations Framework Convention on Climate Change
CRRH	Regional Committee on Hydraulic Resources
CTAF	Regional Technical Committees
CTEA	Special Amazon Territorial Jurisdiction
DAAD	German Academic Exchange Service
DIDVI	Directorate of Research for Inclusive Green Development
DEFRA	Department for Environment, Food & Rural Affairs
DVI	Inclusive Green Development
EbA LAC	Scaling up Ecosystem-based Adaptation Measures in Latin America
ECA	Field School
EfD-CA	EfD Central America
FCD	Friends for Conservation and Development
FHIA	Honduran Foundation for Agricultural Research and the Cocoa and Agroforestry Program
FdAT	Transboundary Water Fund for the Lempa River Basin
FLU	Federations, Leagues, and Associations of ASADAS
GAIA	Research Group on Agroecosystems and Conservation in Amazonian Forests
GGRETA	Governance of Groundwater Resources in Transboundary Aquifers
IFARHU	Institute for Training and Use of Human Resources in Panama

IPCC	Intergovernmental Panel on Climate Change
MAATE	Ministry of the Environment, Water, and Ecological Transition of Ecuador
MARN	Ministry of Environment and Natural Resources of Guatemala
MESCYT	Ministry of Higher Education, Science, and Technology of the Dominican Republic
MIDES	Ministry of Development of Guatemala
MINEDUC	Ministry of Education of Guatemala
MIPYMES	Micro, Small, and Medium-sized Enterprises
MSPAS	Ministry of Public Health and Social Assistance
NAR	Regenerative Food Businesses
NDC	Nationally Determined Contributions
ODS	Sustainable Development Goals
OMM	World Meteorological Organization
ONU	United Nations Organization
OPP	Small Producers Organizations
PITAG	Technological Innovation Program in Agriculture and Agroforestry
PROAmazonia	Amazonian Comprehensive Program for Forest Conservation and Sustainable Production
PPS	Sustainable Productive Landscapes in the Peruvian Amazon
PNUMA	United Nations Program for the Environment
PSA	Payments for Environmental Services
SAF	Agroforestry Systems
SAFM	Multistrata Agroforestry Systems
SbN	Nature-based Solutions
SCOPE	Sustainable Consumption and Production Research Program
SECAC	Secretariat of the Central American Agricultural Council
SESAN	Secretariat for Food and Nutritional Security of Guatemala
SICA	Central American Integration System
SWISSCONTACT	Swiss Foundation for Technical Cooperation
UAC	Climate Action Unit
UAMCC	Agroforestry and Genetic Improvement of Coffee and Cocoa Unit
UASA	Agrobiodiversity and Food Security Unit
UB	Biostatistics Unit
UBBPP	Forests and Biodiversity in Productive Landscapes Unit
UCSHS	Watersheds, Water Security, and Soils Unit
UEAAS/efd	Environmental Economics and Sustainable Agribusiness Unit
UGMA	Livestock and Environmental Management Unit
UICN	International Union for Conservation of Nature
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPC:	Peruvian University of Applied Sciences
USAID	United States Agency for International Development

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