

Biennial Report 2016-2017



Contents

3	Introduction
5	Governing bodies of CATIE
6	CATIE: mission, vision and values
7	The three pillars that underpin our philosophy
9	CATIE and the Sustainable Development Goals
15	Promoting quality education
18	Cutting-edge research
29	CATIE and IICA: partners for sustainable development
31	Responding to the region's demands
40	Institutional strengthening
42	Our finances



Introduction



In this period, CATIE focused its efforts on formulating integrated solutions to address the complexity of current problems facing agriculture and natural resources in Latin America and the Caribbean.

The direct beneficiaries of these actions were small producers located fundamentally in areas delimited by agriculture, poverty and conditions of vulnerability. Governmental and private organizations at local and national levels, extensionists and decision makers at technical and policy levels were also key to implementation and transfer of the knowledge and experiences generated by CATIE in alliance with multiple partners.

In the year 2016, CATIE focused on making decisions based firmly on improving performance.

Further, to increase the impact of our work in well-being and sustainability, in 2017 we developed new lines of work framed within global guidelines such as the Sustainable Development Goals (SDGs) in order to contribute to the development of a green, resilient and inclusive agricultural economy and to the conservation of natural resources required by the Latin American and Caribbean region in the 21st century.

We strengthened the regional scientific platform specialized in agriculture and natural resources, with the consolidation of strategic alliances, more researchers from highly prestigious institutions and strategic projects to attend to the urgent needs of the region. This platform takes advantage of the integration in research carried out by students in the graduate school and the infrastructure for extension that CATIE has in the countries.

We also moved forward in strengthening the educational offer, with greater possibilities for financing, solid alliances with prestigious institutions and consolidation of a first-class faculty for continuous training of leaders of change.

This report presents an overview of the work done by the institution during 2017. Our commitment will be to continue working year after year to achieve sustainable and inclusive human well-being of rural populations.



Muhammad Ibrahim, PhD
Director General
Tropical Agricultural Research
and Higher Education Center

Governing bodies of CATIE

CATIE has three upper-level governing bodies

1

The Inter-American Board of Agriculture (IABA) is the supreme governing body of CATIE. It is made up of 34 member countries that hold a regular meeting every two years.

2

The Council of Ministers is made up of the countries of Latin America and the Caribbean that are regular or affiliated members of CATIE. The Inter-American Institute for Cooperation on Agriculture (IICA) has a permanent seat on the Council, as does the Inter-American Board of Agriculture.

Costa Rica
Luis Felipe Araúz
Minister of Agriculture and Livestock

Belize
Godwin Hulse
Deputy Prime Minister and Minister of Natural Resources and Agriculture

Bolivia
César Hugo Cocarico
Ministry of Rural Development and Lands

CATIE
Dr. Muhammad Ibrahim
Director General

Ecuador
Rubén Flores
Minister of Agriculture and Livestock

El Salvador
Orestes Fredesman Ortez Andrade
Ministry of Agriculture and Livestock (MAG)

Guatemala
Mario Estuardo Méndez Cobar
Ministry of Agriculture, Livestock and Food

Honduras
Dr. Santiago Ruiz
Minister Secretariat of Agriculture and Livestock

IICA
Dr. Manuel Otero
IICA Director General

México
Lic. José Eduardo Calzada Rovirosa
Secretariat of Agriculture, Livestock, Rural Development, Pesca Fisheries and Food

Nicaragua
Edward Centeno
Ministry of Agriculture and Forestry (MAGFOR)

Panamá
Dr. Eduardo Enrique Carles
Ministry of Agricultural Development

Paraguay
Rolando de Barros Barreto
Secretary of Environment (SEAM)

Dominican Republic
Ángel Estévez
Ministry of Agriculture

Venezuela
Wilmar Castro Soteldo
Ministry of Popular Power for Agriculture and Land

3

The Board of Directors consists of various members who serve ad honorem and meet at least twice a year.

Government of Costa Rica: Luis Felipe Araúz	Minister of MAG
Manuel Otero	IICA Director General
Mariuxi Gómez Torres, Ecuador	IABA Representative
Nigel Poole (President of Board of Directors)	International Community
José Juventino Gálvez (Vice President of Board of Directors)	Member Country
Alan Bojanic	Member Country
Esteban Girón, Panamá	Governing Council Representative
Mirna Cunningham	Member Country
Walter Fust	International Community
Laura Scandurra	International Community
Carlos Casamiquela	International Community
Inocencio Higuera	Member Country
Helmut Eger	International Community

CATIE: mission, vision and values

Mission

Increase sustainable and inclusive human well-being in Latin America and the Caribbean, promoting education, research and outreach for the sustainable management of agriculture and conservation of natural resources.

Vision

To be an excellent international land-grant type of university specialized in agriculture and natural resources that effectively integrates education, research and outreach in alliance with multiple partners and countries through a solid regional scientific platform.

Values

Appreciation of diversity, entrepreneurial spirit, excellence, innovation, integration, service and accountability



The three pillars that underpin our philosophy

Education

CATIE is a graduate-level university that enjoys ample prestige and international recognition, for the following reasons, among others:

- › It has the oldest International Graduate Program in Agriculture and Natural Resources in Latin America (since 1946), with more than 2300 graduates.
- › Its academic offer includes options for strategic courses, diplomas, specializations, academic master's, professional master's and international doctorates in different fields.
- › Its students and graduates come from 40 countries located in different continents, principally America.
- › The faculty consists of teachers and scientists from more than 25 countries around the world.
- › Its graduate programs are international in their focus, approaches and contents.
- › It has joint master's and doctoral programs with prestigious international universities (for example, Bangor University, University of Idaho, University of North Texas).
- › It has agreements with more than 50 universities and 400 partners in different parts of the world.

Research

The research carried out by CATIE has a systemic approach, for example, the climate-smart-territories approach. It starts from a holistic assessment of the problems and opportunities in the rural areas, with an emphasis on inclusion and gender. We maintain some specialized lines of research whose implementation and sharing of results are framed in projects with systemic approaches that contribute in an integrated way to achieving sustainable and inclusive human well-being.

The principal actions of research and development are carried out through three scientific programs: the Agriculture, Livestock and Agroforestry Program (PRAGA, Spanish acronym); the Research Program on Development, Economy and Environment (PIDEA, Spanish acronym); and the Forests, Biodiversity and Climate Change Program (PBBYCC, Spanish acronym). These programs cover a broad thematic area (coffee, cacao, climate change, sustainable livestock, policy formulation, forests, watershed management, and biological corridors and protected areas, among others) and with lines of work that aim for a scientific contribution in keeping with the demands of its member countries and Latin America in general.

Outreach

We have 13 member countries in Latin America and the Caribbean and our actions have different levels of impact. Our work includes transfer of technology and knowledge and influence on policies at different scales, which contributes to the reduction of poverty and the economic, social and environmental development of the region.


Lines of research



Member countries

CATIE and the Sustainable Development Goals

From CATIE's perspective, the main challenges confronting Latin America and the Caribbean include persistent poverty, growing inequality, high vulnerability to climate change and progressive degradation of forest and productive landscapes.

 CATIE's theory of change (ToC) (see Appendix 1) describes the way in which the work of research and education at CATIE is conceptualized and articulated in the effort to fulfill its strategic mission and more specifically aim at the generation of products that, placed in the hands of our target groups, will generate measurable effects that together reduce poverty and increase the well-being of rural populations through the development of a green and inclusive economy.

This impact is clearly aligned with the Sustainable Development Goals (SDGs), in particular, with the goals of ending poverty (SDG-1), elimination of hunger (SDG-2), gender equality (SDG-5), responsible consumption and production (SDG-12), climate action (SDG-13) and its key link with the Paris Agreement and life on land (SDG-15). The impact will also contribute to achieving the Convention on Biological Diversity's five Aichi Targets and, in terms of restoration of degraded lands, the Bonn Challenge and Initiative 20x20.

The CATIE lines of work support achievement of the SDGs, understanding that CATIE's work is inherently systemic, so that our lines of work contribute to multiple SDGs.



-  **Line 1:** Ecological intensification of agricultural, agroforestry and livestock systems to increase their productive efficiency and their resilience
-  **Line 2:** Ecosystem services for human well-being
-  **Line 3:** Restoration of ecosystem functions and services: water, soil, carbon sequestration
-  **Line 4:** Architecture of financial and nonfinancial instruments for the sustainable management of ecosystems and productive sectors
-  **Line 5:** Public policies and instruments of governance for human well-being and sustainable management of ecosystems
-  **Line 6:** Green, inclusive and sustainable value chains
-  **Line 7:** Vulnerability assessment and planning for climate action at national, regional and global levels
-  **Line 8:** Ecosystem and hydrological modeling and quantification of flows of carbon and greenhouse gases
-  **Line 9:** Analysis of decision making about production and consumption at the household level



Promoting
quality
education

Promoting quality education

In 2016, CATIE made progress on its strategic objective to offer relevant training processes by reforming the length and content of its scientific master's degrees from 24 to 18 months. The reform explicitly incorporates—for each one of the areas of specialization—the complex relationships between economic, social and environmental dimensions of production and conservation at the beginning of the 21st century. The process passed the scrutiny of the National Accreditation System for Higher Education (SINAES, Spanish acronym), complying also with the standards of the National Council of Rectors (CONARE), National Council of Private University Higher Education (CONESUP) and Central American University Council (CSUCA) on the educational quality and the required academic loads.

In May 2017, Dr. Isabel Gutiérrez became the first woman to assume the post of dean of the Graduate School, evidence of the institution's substantive progress in the application of the Gender Policy and with it, a commitment to the empowerment of women in strategic positions.

Gutiérrez is Colombian and has been at CATIE for 12 years, where she received a Master's

in Integrated Management of Natural Resources in 1996, with an emphasis on management and conservation of biodiversity. She received a degree in biology from the National University of Colombia and also holds a PhD in Rural Sociology from Iowa State University, obtained in 2005.



You are now ambassadors for the name of CATIE; We are confident that you will know how to carry out our mission to promote the sustainable management of agriculture and the conservation of natural resources wherever you go," Muhammad Ibrahim, Director General of CATIE, July 2017 graduation..



Worth highlighting in this effort is CATIE's gender approach, begun in 1996, which has had a fundamental effect on our graduates. Up to 1995, only 10.5% of the graduates were women, while from 2006 to 2016, 48.3% of the graduating classes were women. In 2016, the four doctorates and more than half of the master's degrees were obtained by women from many various countries in Latin America.

The Graduate School also consolidated its major role in training leaders, and in 2017, two graduations were held: one on July 14 and the other on December 8. A total of 83 new professionals graduated (38 women and 45 men) who will return to their countries to promote sustainable and equitable rural development.

The contribution of our students has been relevant at the research level: the professors and students in the Graduate School generate more than 80% of CATIE's research, offering important studies and technologies to the countries.

To encourage this process, in October, the Graduate School held the First Research Symposium during which 28 drafts of academic master's theses were presented that will impact nine countries. The symposium was divided into four areas tied to CATIE's work: economy, development and climate change; agroforestry and sustainable agriculture; management and conservation of tropical forests and biodiversity; and integrated management of watersheds



Geographic reach of research in CATIE's education program

Other outstanding actions



More opportunities for growth

In 2017, about USD 2.7 million were managed. Some concrete examples include:

- › Improvements to infrastructure and Internet access carried out in student residences (proposal to USAID-ASHA for USD 720 000)
- › Two new sources of scholarships explored: 1. PRONABEC Peru, with 15 scholarships (minimum) per year for five years (USD 1 800 000) and 2. Belgian Technical Cooperation in Bolivia, with three scholarships (minimum) per year for three years (approximately USD 216 000).
- › Advances made in the consolidation of an agreement with the Ministry of Science, Technology and Telecommunications (MICITT) of Costa Rica to hold a call for CATIE-specific scholarships (at least five annual scholarships: about USD 170 000).

Admissions

The Office of Admissions attended to some 500 requests for information and processed 269 admissions for the 2018–2019 period. In 2017, a total of 193 students were admitted: 98 men and 95 women. Nine institutions gave scholarships to a good number of students; for example, some 43 candidates applied for the German Scholarship Program DAAD, where six were awarded to the 2018–2019 class, to students from El Salvador, Honduras and Belize. The Scholarship Program for Indigenous Peoples (PROBEPI-CONACYT) in Mexico presented five scholarships for this same period. The CRUSA Foundation awarded scholarships to four Costa Rican women, and the Open Society Foundation (OSF) gave a scholarship to a student from Ruanda, a student from Uganda and a Haitian professional.

Promotion

The Graduate School participated in diverse events to publicize its academic offerings and reaffirm its commitment to human capital in the region:

- › CATIE International Fair
- › Expo Calidad, organized by the National Accreditation System of Higher Education (SINAES, Spanish acronym) of Costa Rica
- › International Congress of Financing and Educational Credit (APICE)
- › Visits to the National Council of Science and Technology (CONACYT), Graduate Scholarship Program for Indigenous Peoples (Probepi), Kellogg Foundation and the Inter-American Institute for Cooperation on Agriculture (IICA) in Mexico
- › Visits to financial entities in Guatemala (Guatefuturo, Secretariat of Planning and Scheduling of the Presidency—SEGEPLAN, etc.) Costa Rica—United States Foundation (CRUSA) and the University of Forest Sciences (UNACIFOR) in Honduras

Agreements

To broaden the processes of publicizing the graduate programs while at the same time leverage funds to finance students, agreements with 10 institutions were renewed and signed:

- › Ministry of Public Education—MEP (Costa Rica)
- › Sustainable Amazonas Foundation (Brazil)
- › Francisco de Paula Santander University (Colombia)
- › Marista University of Merida (Yucatan, Mexico)
- › University of North Texas (United States)
- › CONACYT (Mexico)
- › Polytechnic University of Madrid (Spain)
- › Government of Nariño (Colombia)
- › COLFUTURO (Colombia)

A young man with dark hair and glasses, wearing a blue and white plaid shirt over a white t-shirt, is focused on examining a branch of a coffee plant. He is holding a cluster of coffee cherries, some of which are red and ripe, while others are still green. The background is a lush, green coffee plantation with many more branches and leaves. The text "Cutting-edge research" is overlaid on the left side of the image in a white, sans-serif font.

Cutting-edge
research

Cutting-edge research

Forests, Biodiversity and Climate Change

In 2016, CATIE, through its Forest, Biodiversity and Climate Change Program (PBBByCC, Spanish acronym) carried out various actions of policy incidence, forestry and conservation in the region.

Costa Rica	Participated in the National Commission for Forest Sustainability (which approved its standard for sustainable management of secondary forests), the Commission for Follow-Up to the National Forestry Development Plan (PNDF) and the Committee of Experts for the Landscape Restoration Master Plan.	Supported the development of concept notes on inclusive productive landscapes.	Led a project on conservation of marine-coastal ecosystems and their ecosystem services for inhabitants of the northern coast.	Delivered interdisciplinary analyses of sites important for conservation to the National System of Conservation Areas (SINAC).
Nicaragua	Evaluated the impact of the Nicaraguan law banning logging, Law No. 585, using the National Forest Inventory (INF).			
El Salvador	Coordinated the new project of technical support for development of the National REDD+ Strategy MbA.			
Honduras	Contributed to the Conservation and Forestry Development Institute (ICF) of Honduras in the development of a sustainable forest management program to restore 500 000 ha of pine forests attacked by weevils.			
Guatemala	Published Estado de conservación de las poblaciones de cinco especies maderables en concesiones forestales de la Reserva de la Biosfera Maya, Guatemala (State of Conservation of the Populations of Five Timber Species in Forest Concessions in the Maya Biosphere Reserve, Guatemala)—a key process for community forest management supported by Bosques since the beginning of the 1990s.			
Central America	Assisted the forestry technical group of the Central American Commission on Environment and Development (CCAD) in the design of a monitoring and implementation system on the impact of forestry policies in the context of PERFOR.	Began the analysis of the synergies of the mechanisms of FLEGT (EU program for application of forest laws, governance and commercial forests) and REDD+ in Guatemala, Honduras, Panama and Colombia.	Supported initiatives in value chains for forest products through synthesis documents in Guatemala, Honduras, Nicaragua and Costa Rica.	

The Program represents CATIE in top subcontinental and regional initiatives in the institution's field of action. One of these is the Ibero-American Model Forest Network (IAMFN), which manages the knowledge and interchange of experiences in Ibero-American Model Forests. In 2017, Roger Villalobos of PBBByCC was named president; therefore, the actions of this network are articulated and coordinated from CATIE. For example, in 2017, IAMFN incorporated two Amazonian model forests: the Amazonas Tapajós Model Forest (state of Pará, Brazil) and the Villa Rica Model Forest (province of Oxapampa, Peru). IAMFN now has 34 model forests in 15 countries of Central America, South America, the Caribbean and Spain.

Through the IAMFN, an important synergy was developed for CATIE's participation in the 20X20 Initiative on degraded lands with the World Resources Institute, where it contributed its experience in technical assistance to fulfill the initiative's objectives, developing seven events (courses and workshops) in Mexico, Central America and Peru.

Through the Kenton Miller Chair on Protected Areas and Biological Corridors, CATIE's position was reinforced with respect to territorial management approaches with assumption of the coordination of the Biological Corridors Network for Latin America and the Caribbean, a platform that brings together national coordinators of biological corridors of the countries in the region.



Kenton Miller Chair

- › Organized the XI Latin American Symposium of Biological Corridors, drawing more than 200 participants.
- › Helped strengthen protected marine-coastal areas in Honduras.
- › Completed the multidisciplinary analysis for the establishment of new protected areas in Costa Rica.
- › Began consolidation of the national monitoring system for 33 individual protected areas in Costa Rica.



Helping countries address climate change

The focus on mitigation and adaptation to climate change was reflected in a CATIE collaboration with the El Salvadoran Ministry of Environment and Natural Resources (MARN, Spanish acronym) through the Ecosystem and Hydrology Modeling Unit (UMEH, Spanish acronym) and the Forest Management and Global Change Unit (UMFCG, Spanish acronym), to complete the new forest map of the country, give technical assistance for development of its REDD+ MbA (mitigation based on adaptation) National Strategy and design a system to monitor the cobenefits generated by that strategy.

Along the same lines, the UMFCG generated a regional report and three reports for Brazil, Guatemala and Mexico on the state of forest monitoring and the use of technologies within the framework of the project entitled Transfer of Technology Mechanisms and Networks Related to Climate Change, in which CATIE leads the actions on technology transfer that improves forest-resources monitoring systems. This project seeks to promote the development and transfer of environmentally rational technologies in Latin America and the Caribbean in order to contribute to the final goal of reducing greenhouse gas emissions and vulnerability to climate change in specific sectors in the region.

Another important 2017 contribution to the region by the institution was the analysis done by CATIE's Latin American Chair in Policy and Forest Economy (CLAPEF) in Honduras, Guatemala, Colombia and Panama on the effect of actions to strengthen application of Forest Law Enforcement, Governance and Trade (FLEGT) in mitigation of climate change in the context of the REDD+ strategy. The analysis identifies clear potential synergies between FLEGT and REDD+ for the four countries and provides operational recommendations and a policy synthesis.

Internationally recognized research

- › With support from the Latin American Chair for Ecology in Management of Tropical Forests, four researchers published articles in international scientific journals on the effects of global change drivers on tropical ecosystems. Two of these publications stem from research the chair has carried out since 1987 in the San Juan-La Selva Biological Corridor in Costa Rica.
- › CATIE's participation in international research networks through this chair also contributed to another high-level international publication on the factors that influence the functioning of tropical forest ecosystems.
- › Finally, a researcher from the Ecosystem and Hydrology Modeling Unit is the coauthor of another high-level international publication, included as one of the 25 scientific articles on climate change most cited in the press and social media during 2017.



Innovative projects in forest restoration and sustainable management

During 2017, several innovative projects were spearheaded by CATIE. The Territorial Forest Management Chair (CGFT, Spanish acronym) implemented two projects on sustainable management of secondary and degraded forests (MFSS, Spanish acronym) as tools for land restoration with private-sector investment.

In the first project, the chair advised the Luxembourg cooperation agency LuxDev and the Forestry and Climate Change Fund (FCCF). To date, 31 potential projects have been identified, encompassing indigenous communities, farmer organizations and others in Guatemala, Nicaragua and Costa Rica. In the projects chosen, which can receive financing from FCCF in the short or medium term, innovative structuring of various financial credit instruments for MFSS will be developed.

These include the transformation and marketing of products and capitalization of a business to promote the formation of a “timber bank” that will work to connect various links in the chain of the timber market, linking forest owners and facilitating placement of their forest resources in the markets at good prices and within the value chain system.

The second is the innovative project Development of Sustainable Management Models in Secondary Forests and Their Connections with the Private Financial Sector, with financing from the IKI program of the German government. The project seeks policy impacts, links to national and international investors and e-commerce platforms, the development of demonstration areas and training in MFSS, and innovation in the application of cutting-edge technologies to forest monitoring. The financial potential from sustainable management of secondary forests as a tool of restoration of degraded lands was demonstrated by an increase of some USD 32 000 in the value of CATIE’s biological assets a project generated from the inventory of 30 ha of secondary forest.

Databases available to researchers



- › The Ecosystem and Hydrology Modeling Unit reestablished the database service for researchers and other users in the region.
- › The Ecology in the Management of Tropical Forests Chair developed a system for management of its databases on long-term ecological research.

These data and their dissemination through publications and user requests have influenced the management of forests and territories in the region, contributing to the countries' fulfillment of their commitments to international conventions.

Actors from biological corridors in Mesoamerica, the Dominican Republic and Colombia share their experiences in Costa Rica

In November 2017, actors that manage various biological corridors in the Mesoamerican region and in the Dominican Republic and Colombia gathered in Costa Rica to share their experiences, advances in research and challenges, specifically at the XI Latin American Symposium on Biological Corridors. The event was organized by the Biological Corridors Thematic Interest Group of the Mesoamerican Society for Biology and Conservation (SMBC, Spanish acronym), which has been coordinated by CATIE since 2007. The participating experts from CATIE shared from their research, including the contributions of a livestock farm to conservation of biodiversity and landscape connectivity, tools for connectivity in productive landscapes in Colombia, adaptation based on ecosystems in an urban context, the conservation plan for the Río Torres Interurban Biological Corridor, and the challenge of climate change for biological corridors. In conjunction with the National Commission for the Knowledge and Use of Biodiversity (CONABIO) of Mexico, the institution also introduced the Biological Corridors Network (CoBioRed) as a platform for learning and knowledge management.

Development, Economy and Environment

El Research and Development Program in Economy and Environment (PIDEA) continued consolidating a dynamic, research team, successful in terms of producing evidence to support decision making at different levels, publications and generation of financing for research and international collaboration.

Decision making based on evidence

Evidence being used by institutions in the region to improve the efficiency of their policies, programs and actions has been produced within the framework of various projects.

The identification of priority areas for the conservation or restoration of hydrological services for rural human consumption in Central America, carried out by the AC3 Research Project, has enabled the Community Organizations for Water and Sanitation Services (OCSAS, Spanish acronym) in peri-urban and rural areas to make informed decisions and implement effective actions for adaptation to climate change. Many of these actions are, in turn, being incorporated into national strategies, plans and policies for adaptation to climate change in this subregion.

The result of a study carried out by CATIE for the Office of Climate Change of the Costa Rican Ministry of Environment and Energy, with funds from the Euroclima project of the Economic Commission for Latin America and the Caribbean (CEPAL), identified the economic impact of air pollution and how much the country would be able to save by implementation of policies that contribute to decontamination of the air. The results indicate that the country would be able to save:

- › USD 17 million a year in medical care for bronchitis (and its impact on disabilities and quality of life)
- › USD 55 000 for asthma
- › USD 233 000 in hospitalizations

These results are being used as potential benefits to be generated by projects under development, for example, electric transportation.

Technical assistance to institutions in the region



Costa Rica: assisted the National Irrigation and Groundwater Drainage Service with the design of a project on irrigation, potable water and hydroelectric energy.

Nicaragua: advised the Nicaraguan Electricity Company on design of a payment scheme for ecosystem services.

Workshop on political interaction brings together researchers, cooperatives, government agencies and the private sector to discuss the challenges and opportunities for the coffee sector in Costa Rica

In August 2017, an Environment for Development (EfD) Initiative workshop on political interaction brought together researchers and decision makers from the Costa Rican coffee sector to present their contribution to the political discussions on agricultural and environmental topics. The objective was to identify priority areas for future research efforts, institutional strengthening and development of public policies in line with the needs identified. Key aspects were identified during the workshop, such as the need for a holistic approach to diminish the pressures on the coffee sector, reduce vulnerability to climate change and adopt more appropriate production models. The final reflection focused on the lack of bidirectional information for all sectors involved and on how to create spaces and efforts to improve decision making and the strategies of the public and private sectors and academia. The event attracted relevant governmental agencies such as the Ministry of Agriculture and Livestock (MAG, Spanish acronym), National Coffee Institute (ICAFE) and National Insurance Institute; private and public banks; international cooperation, represented by the German Agency for Technical Cooperation (GIZ) and the Inter-American Development Bank, as well as research institutions such as the Research Program on Climate Change, Agriculture and Food Security (CCAFS) and important coffee cooperatives.

Other outstanding actions

Capacity building

El proyecto CASCADE fortaleció las capacidades de más de 150 técnicos de Guatemala, Honduras y Costa Rica en acciones de adaptación basadas en servicios ecosistémicos. Estas capacitaciones fueron replicadas por nueve instituciones locales alcanzando más de 1000 agricultores.

Collaboration and networking

PIDEA researchers reinforced their collaborative and networking efforts both at national and international levels with institutions such as the Costa Rican Institute of Aqueducts and Sewers, Costa Rican Coffee Institute (ICAFE), Forest Financing Fund and Costa Rican Ministry of Environment and Energy; the National Environmental and Planning Agency of Jamaica, and the Ministry of Agriculture, Forestry, Fisheries, Environment and Sustainable Development and Immigration of Belize. It also worked with coffee cooperatives and with international organizations such as Conservation International and the Food and Agricultural Organization (FAO) of the United Nations. The actions undertaken include advice in preparation of projects on topics that range from adaptation to climate change in rural areas and climate-smart agriculture to the design of payment schemes for environmental services.

Agreements

Strategic alliances: two relevant alliances fortified during 2017 include those with Bioversity International and the Climate Change, Agriculture and Food Security Program (CCAFS), both with CGIAR. With the first, a research project being jointly executed applies innovative crowdsourcing and citizen science tools to enable small producers to identify the varieties of beans best adapted to climate variability in the Central American Dry Corridor.

Dissemination of knowledge

This dissemination was generated by CATIE's participation in various forums and international congresses, both through joint organization or presentation of relevant research results or development of methodologies. Highlights among the events were the Regional Workshop on Environmental Accounting for Latin America and the Caribbean (ALC), organized jointly with CEPAL and the World Bank; the First National Conference on Climate Change in Honduras and Guatemala; the 23rd Annual Conference of the European Association of Environmental and Resource Economists; and the Seminar on Methodologies for the Analysis of Potential Impacts of Climate Change on Food and Nutritional Security in Central American Integration countries, organized by CEPAL, among others

Sustainable agribusiness

Some 17 consultancies/projects were carried out on this topic, whose main impacts were trade agreements for USD 604 000 generated in a round of negotiations for cocoa (Mesoamerican Cacao Project); strengthening of rural associative businesses in Costa Rica through development of eight value-added products (Reaching Scale Project); strengthening of financial capacities and design of a web tool for cocoa costs (Cocoa Mobile Project). Also, 54 people (25 women) took the Virtual Diploma Development of Rural Associative Businesses (DERA), and the foundation for strengthening the cocoa value chain in Costa Rica was defined for 2018–2018.

Agriculture, Livestock and Agroforestry

PRAGA integrates CATIE actions in three major areas of work: 1) agroforestry, coffee and cacao; 2) agrobiodiversity and 3) sustainable livestock. A synthesis of the main achievements in these areas in 2017 follows.

I. Agroforestry, coffee and cacao

Agroforestry

- › In 2017, the second phase of the global initiative Forests, Trees and Agroforestry (FTA) began, in which CATIE participates as a member of a global research consortium made up of the Center for International Forestry Research (CIFOR), World Agroforestry Center (ICRAF), CATIE, Bioversity International, the French Agricultural Research Center for International Development (CIRAD), International Network for Bamboo and Rattan (INBAR) and Tropenbos International (TBI). As part of this initiative, CATIE carries out research and development on the management and restoration of agricultural landscapes, climate change, and agroforestry systems with coffee and cacao and in silvopastoral systems.
- › The Shademotion 4.0 (www.shademotion.net) software was launched, a modeling and design instrument for improved agroforestry systems, with users from more than 25 countries around the world.
- › A restoration-reforestation project was begun with five agroforestry system modalities in five priority watersheds in Panama. (La Villa, Chiriquí, Chiriquí Viejo, Río Grande and Río Santa María), with a budget of USD 1.535 million for two years of execution.
- › Work proceeded actively with the private sector, for example, with Fazenda da Toca (Brazil), where a center for research, studies and promotion of agroforestry is being set up on a large scale and for big commercial farms. Long-term experiments are established in this business in agroforestry systems with citrus, bananas, coffee and livestock.

A laboratory in the field



In 2017, 17 years of continuous studies in a long-term experiment on agroforestry systems in coffee planted on the CATIE farm in Turrialba ended. In the experiment at CATIE, more than 30 master's, doctoral and postdoctoral theses have been conducted, generating key information for researchers, technicians, producers and decision makers in the region. The contributions have been many and, in particular, have generated knowledge that has been used as input for public policies, technical assistance and training programs, among others. A replica of this experiment is found in Masatepe, Nicaragua.

Cacao

- › The Mesoamerican Genetic Improvement Program formalized its ties with the Korean Government Cooperation (KoLFACI) in 2017 in a research and development project that includes the participation of eight countries: five in Central America (Costa Rica, Honduras, Guatemala, El Salvador and Nicaragua), two in South America (Colombia and Peru) and one in the Caribbean (Dominican Republic). This project, together with key actors and research centers in each country, will evaluate modern cacao technologies, from assessment of new germplasm to the agricultural and agroforestry management technology for a sustainable diversified production. Based on these evaluations, it is expected that strategic recommendations can be made for small producers.
- › In partnership with the United States Department of Agriculture (USDA), a field trial was begun in Mayaguez, Puerto Rico, that includes new improved genotypes from Puerto Rico and clones selected by CATIE.
- › The CATIE improved clones (known as the CATIE_Rx series, with R indicating tolerance to moniliasis) continue to show a high potential in yield and quality at the sites where they have been distributed (Central America, Mexico, Brazil). In 2017, these clones were recognized in the quality competition held in Managua, Nicaragua, where the Panamanian company KOTOWA won the silver medal in the 85% chocolate bar category.
- › The CATIE_Rx clones have been officially registered in the seed offices in Costa Rica and Honduras
- › (Nicaragua in process) and an agreement with the private company ECOM in Nicaragua has been reached for massive multiplication of these clones.
- › CATIE's work in genetic improvement of cacao was presented in international seminars in Korea, China, Haiti, Jamaica, Ecuador, Mexico, Nicaragua, Peru and Honduras and has been described in various articles that earned broad coverage, including *El Financiero* (Costa Rica), *Viva el Cacao* (Venezuela), *The New York Times* (United States), *New Scientist* (England) and the *Journal Chocolat* (Sweden), among others.



Coffee

- › In 2016, CATIE's helped create the first NAMA (Nationally Appropriate Mitigation Action) for coffee in Costa Rica and the world, with the goal of reducing greenhouse gas (GHG) emissions in coffee production and processing.
- › Established, in collaboration with the Costa Rica Coffee Institute (ICAFFE), a baseline on coffee production systems and their opportunities and challenges and created a training program for technicians and farmers. The experience was duplicated with the coffee institutes of Guatemala and Honduras.
- › In 2016, Distributed coffee hybrids in Costa Rica, Nicaragua and Guatemala in the first phase of the CGIAR research program called Forest, Trees and Agroforestry (FTA 2011–2016).
- › A species of coffee (*Coffea sessiliflora*) was discovered in the CATIE germplasm collection that has a high potential for commercialization as a coffee with high cup quality. In partnership with the private sector (Japanese Company DAITO and C.O.D.A Investment Limited of Costa Rica), a project has been developed to study the agronomy and organoleptic characteristics of this species more in detail in several agroecological environments in Costa Rica. The expectations are high because of market opportunities and the fact that this species originated in low areas, which would offer producers around the world opportunities to cultivate gourmet coffee at low altitude.
- › A second phase of the PCP scientific partnership platform was developed and approved for 10 years between CATIE and CIRAD. The second phase has a new scientific framework to increase the link between biophysical and social research and improve the impact of results on the development and well-being of small producers.
- › Joint work continues with the Chinese Academy of Tropical Agricultural Sciences (CATAS) and with the South Korean Research Institute on Climate Change and Agriculture (ARICC) on the development of new varieties of arabica coffee that will be evaluated in China's tropical regions and the subtropical regions of Korean to facilitate expansion of coffee growing in those countries
- › The year 2017 was the first for the project entitled Technological-Financial Alternatives for the Renovation, Rehabilitation and Promotion of Coffee Plantations in the Dominican Republic, executed in partnership with the Dominican Coffee Council (CODOCAFE) and financed by the Dominican Republic Fund for Science and Technology (FONDOCYT). This project focuses on the calibration of a model for renovation and rehabilitation of coffee plantations that will provide solid quantitative information to guide the government's national program for coffee plantation renovation and the efforts of the private and state bank that finances the producers' initiatives.

Knowledge management



In coordination with World Coffee Research (WCR), a manual on coffee rust was published for technicians, which has been downloaded on the CATIE website by more than 20 000 users.



In coordination with IICA-PROCAGICA, the Regional Climate Change Program and its partners and coffee associations of Guatemala, Honduras, Nicaragua and Costa Rica have developed a manual for each country on coffee and climate that has enabled each country to initiate generation of knowledge and data in that country on analysis of vulnerability and adaptive capacity of coffee farms to climate change.

- › CATIE maintains its presence on the board of directors of the technical committee of PROMECAFE, a regional platform that brings together the coffee institutes of 10 coffee-growing countries in Latin America and the Caribbean and carries a lot of weight in the operation of the coffee sector in those countries.
- › The launch of the field actions for the project PROCAGICA (Central American Program for Integrated Management of Coffee Rust) began in 2017, led by IICA, in which CATIE is in charge of outreach, technical assistance and experimental validation of the performance of the technological alternatives promoted by the project in four Central American countries (Nicaragua, Honduras, El Salvador and Guatemala) and the Dominican Republic. The aim is to help recuperate the productive capacity of the coffee plantations that were affected by coffee rust, benefiting more than 1000 producer families that depend on this activity.

2. Agrobiodiversity

- › In 2017, the Forest Seed Bank (BSF, Spanish acronym) distributed 7.5 tons of forest seeds to 18 countries in America, Asia and Africa and generated income of almost half a million dollars. The seed source of *G. arborea* at CATIE is the only one in Latin America with a certified A category.
- › The F1 coffee hybrids, produced for almost 20 years in a joint effort between PROMECAFE, CIRAD and CATIE, is in full expansion in Latin America. Clonation of the F1 coffee hybrids has expanded from rooted minicuttings to a strong investment in infrastructure that enables increasing the greenhouses to nine to establish clonal multiplication gardens and areas for rooting and acclimatization. New hydroponic clonal gardens were established in 2017 that contain almost 20,000 parent plants and greenhouse infrastructure increased for production of 20 000 plants/year of coffee ready to go to the field. The alliance with the Gaia Artisan Coffee business continued to bear fruit and permitted getting nearly 600 000 F1 hybrid plants to coffee growers, with plans to reach 1 million plants in 2018.
- › In 2017, for the fifth year, the Cabiria Farm-Collections and the Botanical Garden were awarded the Blue Flag ecological recognition and the certificate for tourism sustainability given by the Costa Rican Tourism Institute (ICT).
- › A working group called Safeguarding the CATIE Article 15 Collections was established with the participation of researchers from Costa Rica and consultants from the Global Crop Diversity Trust and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) to ensure financing for cryoconservation of genetically diverse seeds of tomatoes, peppers, squash and other important food crops in the CATIE seed chamber.

3. Sustainable livestock

- › Actions began on the new project Promoting the Conservation of Biodiversity Through Climate-Smart Agrosilvopastoral Practices In Landscapes Dominated by Livestock in Three Regions of Mexico (Jalisco, Chiapas and Campeche), known as BioPaSOS. This project is co-implemented by IICA jointly with the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) and the National Commission for the Knowledge and Use of Biodiversity (CONABIO) and is financed by the government of Germany through its International Climate Initiative IKI. The project will strengthen the capability of thousands of producing families to improve the management and conservation of biodiversity in livestock landscapes and support the design of public policy to promote the topic at a national level.
- › In Panama, Honduras and Guatemala, significant contributions are being made to development of strategies for Nationally Appropriate Mitigation Actions (NAMAs) in the livestock sector, participating in the technical support groups and generating scientific evidence useful in design of the strategies.
- › CATIE is a member of the Technical Advisory Group on Biodiversity and Ecosystem Services of the Livestock Environmental Assessment and Performance Partnership (LEAP), a platform between governments, private sector associations and NGOs led by the FAO's Division of Production and Animal Health for development of comprehensive

methodological guides to understand the environmental performance of livestock value chains in order to construct policies and make decisions based on evidence.

- › CATIE actively participates in important networks connected to various components of the livestock chains in Latin America and the world.
- › The institution leads a platform for interchange of knowledge and experience in sustainable livestock, financed by FONTAGRO, IDB, the government of New Zealand and the Global Research Alliance on Greenhouse Gases in Agriculture (GRA). We also participate in the sector's two most important continental forums: FORAGRO and FONTAGRO.
- › In Jalisco, Mexico, we coordinate the knowledge management component of the Initiative to Reduce Emissions (IRE), a national initiative to reduce emissions in the agricultural sector.
- › We work with the International Center for Tropical Agriculture (CIAT) in validation of strategies for greenhouse gas (GHG) emission-reduction strategies.
- › We reactivated relations with two livestock groups in the Dominican Republic and Cuba, with whom various financing proposals have been developed that we hope will bear fruit in 2018.
- › We co-organized the 14th Meeting of the Commission on Livestock Development for Latin America and the Caribbean (CODEGALAC), the Mesoamerican chapter, held in Costa Rica. An official declaration came out of the meeting on the need to begin a development path toward sustainable agriculture, ecocompetitiveness that reduces greenhouse gas emissions and improves adaptation to climate change in the Mesoamerican region and in which CATIE participates, supporting knowledge management, education and research.

Research on sustainable livestock supports decision making in the countries

Important studies were done in Guatemala, Honduras, Nicaragua, Costa Rica and Panama to increase efforts to determine the emissions by livestock in the region of methane, N₂O and soil and water contaminants (nitrates and phosphates). Some important results follow:

1. In the southeastern region of Guatemala, enteric methane constitutes 80% of greenhouse gas (GHG) emissions; dairy farms that do apply good practices emit 2.25 kg CO₂eq/kg of milk, while if they do not, they emit 3,0 kg CO₂eq/kg of milk. In the case of livestock farms producing meat, those that apply good practices emit 10 kg CO₂eq/kg of meat while those that do not emit 12.5 kg CO₂eq/kg of meat. The studies also showed that the livestock farms that retain a good tree population achieve a positive carbon balance.
2. Similar results have been obtained in other projects working in Honduras, Nicaragua, Costa Rica and Panama, using indirect methods for estimating emissions of GHG.
3. Joint studies in Costa Rica with the National Institute of Agricultural Technology (INTA) at its experimental farm Los
4. Diamantes and at CATIE's commercial farm showed how the different stages of animal development modify their GHG emissions.
5. The N₂O emissions that result from the applications of fertilizers (urea, conventional fertilizer, organic fertilizer) in animal production are affected mostly by rainfall and not so much from the source of fertilization.
6. The results of research on GHG emissions and pollutants provide information for the development of public policies for the livestock sector and national actions to comply with goals and commitments assumed in global conventions related to climate change. For example, in Honduras, in coordination with the Ministry of Environment, the Secretariat of Agriculture (SAG), the Honduran National Federation of Ranchers and Farmers (FENAGH) and the Honduran Chamber of Milk (CAHLE), three structures of local governance were formed (local coordination tables) and a national table to promote low-emission sustainable livestock.

Integrative programs

CATIE can contribute solutions to the challenges facing the region and the world, which are complex for their high degree of interrelationships (for example, agriculture, food and nutritional security, climate change, etc.) and that therefore require the integration of various disciplines, sectors, spatial scales and actors at all levels. An example of this integration to attend to the demands of the countries is the Regional Climate Change Program of the United States Agency for International Development (USAID).

In 2017, this program supported preparation of the REDD+ strategies in Central America and the Dominican Republic on topics relevant to social and environmental safeguards; free, prior and informed consent (FPIC); monitoring, reporting and verification (MRV); reference levels; and financing. It also developed Centro Clima, a system of regional climate information oriented to users for decision making at different scales, from the government and the private sector to local users and communities. Users of the coffee, fishery, forestry, water and energy sectors also have climate information tools developed by the program.

In another instance, more than 30 organizations strengthened their capabilities in using meteorological data to evaluate and use data that reduce risks caused by climate change. Finally, the program donated specialized equipment for analyzing wastewater to five laboratories (one in Honduras and four in Panama).

Sico Paulaya: an example that participation in governance of the territory guarantees sustainable management of natural resources

Citizen participation is key to overcoming the effects of climate change; therefore USAID and CATIE helped consolidate and strengthen the Environment and Production Table of Sico Paulaya (MAPSP). Among the actions promoted are capacity building of the people and partners of the Table, promotion of sustainable forest management and good silvoagricultural practices, as well as quantification of carbon captured by forests in the territory. With that, it was possible to energize the MAPSP, doubling the number of members and integrating more relevant actors, such as livestock farmers and coastal Garifuno indigenous peoples. Currently, MAPSP functions as a platform for territorial management with influence at national and international levels, with a more robust governance directed by the local actors themselves, with producers and families better trained and identifying with their own local development. Above all, they are capable of facing the challenges of climate change and guaranteeing the sustainable development of natural resources.



A photograph of a waterfall cascading down a rocky cliff face. The water is white and frothy as it falls over the rocks. The surrounding area is lush with green vegetation, including moss and various plants. The foreground is filled with bright green grass and small plants.

**CATIE and IICA: partners
for sustainable development**

CATIE and IICA: partners for sustainable development

As partners, the Inter-American Institute for Cooperation on Agriculture (IICA) and CATIE have worked for more than 40 years on sustainable development in the region. In compliance with what is in the Bilateral IICA-CATIE Agreement, in 2017 both institutions worked on the mechanisms for coordinating and managing operations to ensure coordination of joint actions of technical cooperation, capacity building and corporate services.

The actions focused on five areas 1) providing assistance to member states to address climate change and mitigate its effects; 2) strengthening the processes of productive innovation; 3) developing institutional frameworks and capabilities for sustainable management of rural territories; 4) collaborating to increase food security of small and medium producers and family agriculture; and 5) other technical cooperation initiatives in the process of analysis and formulation of projects.

The alliance between these institutions should be emphasized for their work on strengthening the sustainability and resilience of the livestock sector in the project Promoting the Conservation of Biodiversity through Climate-Smart Agrosilvopastoral Practices in Landscapes Dominated by Livestock in Mexico (Jalisco, Chiapas and Campeche), known as BioPaSOS. This project is carried out in conjunction with SAGARPA and CONABIO.





Responding to
the region's
demands

Responding to the region's demands

CATIE's mandate addresses the demands and needs of the countries of the Latin American region and the Caribbean, cooperating with them through education, research and technical assistance for human well-being and sustainable and inclusive rural development. In this area, its actions focused mainly on eight countries in the region, among them its member countries.

CATIE's most outstanding achievements in each country



Amazonian Watershed

In the countries of the Amazon Basin, CATIE currently has nine agreements in force with institutions in Colombia, Peru and Brazil, which are being analyzed, aiming to reactivate them and maintain relations and projects.

During 2017, the work focused on beginning a new relationship with the Amazon Environmental Research Institute and the German agency GIZ, with the goal of developing joint projects in 2018 in the Legal Brazilian Amazon, possibly on topics such as sustainable livestock and sustainable tourism as well as reforestation and forest restoration, including environmental services.

Also, an agreement was signed with the Sustainable Amazonas Foundation (FAS, acronym in Portuguese), and there is active participation in the project Capacity Building and Small Grants to Support Mitigation and Adaptation to Climate Change in Amazonia. This project, coordinated by FAS, integrates Peruvian, Colombian and Brazilian Amazonian institutions. The project will be presented to the Green Climate Fund (GCF) or the Global Environment Facility (GEF); the preparation phase is financed by the Development Bank of Latin America (CAF). It will provide solutions on the subject of sustainable development to local communities in the Amazon Basin and have a direct influence on adaptation to climate change and food security.



Actor in the agricultural sector

- › CATIE El Salvador coordinated joint actions to implement the regional agenda of the Regional International Organization for Agricultural Health (OIRSA) and participated in the International Cooperation Roundtable on Agriculture.
- › Also, within the framework of the PROCAGICA project, research actions on 50 coffee farms were supported.

El Salvador

In 2016, as a member of the Round Table on International Cooperation for Agriculture, CATIE participated in various coordination meetings and two national strategic forums. In coordination with the Mangle Association, the National Office helped develop the Plan for Sustainable Local Development for the Bahía de Jiquilisco Biosphere Reserve (financed by the Initiative for the America Fund-FIAES). It also developed the Management Plan for the Microwatershed of the San José River in Metapán, (Ministry of Agriculture and Livestock-MAG and the International Fund for Agricultural Development-IFAD).

One of the most important CATIE initiatives in El Salvador during 2017 was the WaterClima LAC project, financed by the European Union. Actions were undertaken to provide sustainable management of coastal zones, focusing mainly on strengthening the human capital of the Association of Municipalities of Los Nonualcos to prepare them to manage a plan for local sustainable development.

To strengthen more human capital in different entities in the country, a diploma was developed on territorial environmental management for coastal areas, in which 31 Salvadoran officials participated. Likewise, WaterClima LAC innovated in the area of climate information, installing one meteorological station in the municipality of Jiquiliso and a station located in San Ramón Grifal, Tecoluca, San Vicente for monitoring rainwater and river water.

Other relevant achievements in El Salvador were forged through the alliance between CATIE and the Ministry of Environment and Natural Resources (MARN), such as, for example, technical assistance that the center provided in development of the National REDD+ MbA Strategy. With the United Nations Development Program (UNDP), the Vice Ministry of Development Cooperation (VMCD) of El Salvador and MARN, CATIE designed and conducted a semi-presence diploma on climate financing for the country.



Guatemala

CATIE initiatives in Guatemala were aimed at having a more direct impact on national policy and its instruments, as well as with international agreements, working more directly and in response to the country's strategic topics.

Solid participation and strategic support

- › During 2017, CATIE was strongly involved in the Guatemalan System of Climate Change Sciences and the Forest Landscape Restoration Table.
- › With the Promotion Group for the Guatemalan Strategy for Sustainable Low-Emissions Livestock, CATIE began work to prepare the NAMA in livestock. While, with ANACAFE and the Ministry of Environment and Natural Resources, meetings were held to start moving on the NAMA in coffee.

Three flagship projects

- › National Nutrition Information Platform (PiNN, Spanish acronym), executed in coordination with the Secretariat of Food and Nutritional Security (SESAN). Funding from the European Union.
- › Territorial Co-Management for Conservation and Sustainable Management of the Acatenango Volcanic Complex, with funding from the Tropical Forest Conservation Fund (FCA).
- › Climate-Smart Production Systems Based on Silvopastoral Systems in 15 Municipalities in Southeastern Guatemala.

Thus, with respect to the National Policy on Food and Nutritional Security and the National System of Food and Nutritional Security (SIINSAN, Spanish acronym), CATIE helped strengthen national capabilities to monitor the reduction in chronic malnutrition and implement more cost-effective multisectorial policies and programs based on evidence. As part of these efforts, we worked with public institutions such as the Ministry of Public Health and Social Assistance; the Ministry of Agriculture, Livestock and Food; the Ministry of Development; the Ministry of Education, the Municipal Development Institute and the Ministry of Public Finance.

On another topic, and within the framework of the Guatemalan System of Protected Areas (SIGAP, Spanish acronym), support was given to the co-management process for good governance in sustainable management and conservation for the Acatenango-Fuego volcanic complex, providing assistance in the implementation of technical and financial instruments, tourism facilities, ecosystem recuperation and strengthening of the municipalities of Acatenango and San Pedro Yepocapa. Input on knowledge management was generated through farmer field schools (FFS) directed to more than 100 families. This initiative involved coordination with strategic actors, among them the Private Institute for Climate Change Research (ICC), the Guatemalan Tourism Institute (INGUAT), the National Council for Protected Areas (CONAP) and the Community Development Councils.

With support from UNDP, we also worked with 25 pilot farms in Jutiapa, Jalapa and Santa Rosa, to create instruments to reduce emissions of the main greenhouse gases and increase carbon sinks through participatory implementation of silvopastoral systems and other good livestock practices. This is accomplished through implementation of improvements in the productive process based on the silvopastoral-systems approach..

With the Regional Consortiums on Agricultural Research (CRIA), we also contributed to capacity building for the consortiums of local actors to help them manage and participate in applied research in 10 productive chains.



Honduras

The Honduran government, communities and different productive sectors have begun to pay attention to vulnerability to climate change and demand information and knowledge in order to make better decisions in light of the need to adapt to or mitigate the effects of this phenomenon. In 2017, CATIE contributed significantly to responding to this demand through the implementation of three projects:

- › Productive Landscapes
- › Building the Capacity of Forest Communities to Face Climate Change (CLIFOR)
- › Strengthening the Subsystem of Protected Areas on the Northern Coast of Honduras

Substantial progress was made through the Productive Landscapes project on a strategic plan to work toward sustainable livestock in the country; in addition support was given to the livestock NAMA, providing indispensable input for the development of a differentiated mechanism that promotes sustainable livestock practices.

Meanwhile, the CLIFOR project was key to building the capacities of forest communities in decision making around climate change. This project worked directly with the communities to define the vulnerability to climate change and the pressure on forest resources. It also strengthened the network of agroforestry groups and national academic institutions on the issue of climate change and reduction of climate vulnerability. CATIE is a fundamental part of the Interinstitutional Environmental Sciences Committee (CICA, Spanish acronym), an entity that brings together 20 universities in the country to address these important topics.

Finally, the Strengthening the Subsystem of Protected Areas on the Northern Coast of Honduras project addressed the topic of adoption and mitigation of climate change in the country's most important coastal areas, in particular along the Atlantic Coast, where work was carried out with the communities and governmental and nongovernmental agencies to find alternative to stop degradation and encourage adaptation.



Nicaragua

For CATIE in Nicaragua during 2017, the alliance with partners was key, such as the Ministry of Environment and Natural Resources (MARENA, Spanish acronym), Nicaraguan Institute of Agriculture (INTA) and the Ministry of Family, Community, Cooperative and Associative Economy (MEFFCA).

Working together with these institutions, CATIE helped with management of protected areas, providing technical assistance and financial support to the Peñas Blancas Collaborative Management Committee; shared strategies and lessons learned from the projects and CATIE actions in international congresses on sustainable coffee, agroecology and livestock; and trained 25 technicians on climate change and adaptation tools, as well as training diploma students on adaptation of coffee to climate change.

Another topic of special attention in Nicaragua was water harvesting since it guaranteed access to water for 1106 families, who received advice on management of this resource to diversify crops in the country's dry corridor. Also, 797 farm plans and three technical assistance plans were developed, all as part of the Water Harvesting Project.

A systematization of the experiences of this project was documented and recorded and a diploma on water, climate change and watersheds was begun to train 25 technicians.

Presence in national platforms

- › In Nicaragua, CATIE supported the organization of two Nicaraguan Research and Agricultural Innovation System national platforms on coffee and livestock. It also actively participated in the Science and Agriculture for Development Platform, the Soils and Water Platform, the National Watershed Network and the Cacao Platform of the National Center for Agricultural Information and Documentation (CENIDA).

Technicians and families trained

- › A total of 2002 technicians (35% women) received training in workshops and seminars on more than 10 different topics related to natural resource management and the environment.
- › Through farmer field schools (FFSs), 5070 producer families from various municipalities in the country were trained.



Mexico

In 2017, Mexico was one of the countries in which CATIE undertook new initiatives to promote solutions in the areas of livestock, climate change and water resource management. The actions were coordinated through three projects:

- › BioPaSOS, financed by the German government through the International Climate initiative IKI
- › Mechanisms and Networks for Technology Transfer Related to Climate Change in Latin America and the Caribbean. Coordinated by the Inter-American Development Bank (IDB) and financed by the Global Environment Fund (GEF)
- › WaterClima LAC, financed by the European Union (EU)

With BioPaSOS, producer families will receive training in management and conservation of biodiversity through farmer field schools (FFSs). Later, it is expected that these families will be linked to development of a green economy value chain that will enable them to improve their livelihoods and achieve sustainability in their production systems.

At the state level, BioPaSOS works with the Secretariats of Agriculture and Environment to form an interinstitutional coordination platform and a research agenda constructed from assessment of the needs of the livestock sector.

On the issue of climate change, with the project Mechanisms and Networks for Technology Transfer Related to Climate Change in Latin America and the Caribbean, CATIE's main ally has been the National Forestry Commission (CONAFOR). In the framework of this project, the center has led actions for transfer of technology to improve monitoring systems for forest resources.

Additionally, and in coordination with Reforestamos Mexico, CATIE worked in training of decision makers at a national level and of students from southern Mexico in the Wildlife Without Borders Program-Mexico (WWB.MEX).

In the area of water resources, with the WaterClima-LAC project, and the University of Monterrey in La Paz, a pilot study was started that encompasses water balance and a model of subterranean flow with transport of chemicals and identification of recharge zones.

A study was also conducted to determine self-sufficient rates for the Potable Water Operating Agency and alternately will install meteorological stations to gather data to be used to evaluate actual and future vulnerability to the impacts of climate change and its effects.

Cacao clones

- › The high-productivity cacao clones tolerant to frosty pod rot (moniliasis disease) developed by CATIE, together with diverse partners, were put at the disposition of Mexican producers at the end of 2016, in collaboration with the National Institute of Forestry, Agriculture and Livestock Research (INIFAP), Nestlé and the ECOM Agroindustrial Corporation.



Panama

The main protagonist for CATIE's impact in Panama during 2017 was the Regional Climate Change Program of the United States Agency for International Development, which ended that year. There were also four local projects and administration and beginning of a consultancy on watershed restoration.

The institution also carried out work on forest policy, contributing knowledge and experiences on topics such as management of natural forests, community participation on REDD+ topics, rural development policy, and planning to address climate change in the agricultural sector.

Regarding contributions to training of Panamanian professionals, it was also quite a significant year, as CATIE, through the Institute for Training and Development of Human Resources (IFARHU, Spanish acronym), was able to award 10 scholarships that enabled young people from the country to begin graduate studies at the Center.

Some 840 families benefited directly and indirectly from CATIE activities in the country, which contributed in different ways to their development and well-being, principally through projects such as Capacity Building for Coffee Producers in the Panama Canal Watershed, Updating the Gualaca Altitudinal Biological Corridor, Capacity Building for Executors of the Forest Life Program, and Strengthening of Technical Capabilities for MiAmbiente-PROCUENCAS.

The coordination and support of key partners in the country was maintained, for example with the Ministry of Agricultural Development (MIDA), the Ministry of Environment (MiAmbiente), the UNDP Small Donations Program, the National Commission for Rural Territorial Development, Global Water Partnership (GWP) and the International Center for Sustainable Development (CIDES, Spanish acronym).

Impacts on policies

- › Forest management
- › Climate change in the agricultural sector
- › National REDD+ Strategic Plan Rural development
- › Management of protected areas



Peru

CATIE successfully ended the project Climate-Smart Territories as Approach and Management for the Design, Implementation, Monitoring and Evaluation of Adaptation-to-Climate-Change Projects in Peru. This project, funded by USAID, benefited 13 776 Peruvians.

The lessons learned through this project were published in the Workbook for Identification, Formulation and Social Evaluation of Public Investment Projects on Ecosystem Services, a didactic document developed in coordination with the Ministry of Environment and the Ministry of Economy and Finances. This tool was applied to develop 11 projects on ecosystem services, of which five achieved the validation for funding via the Peruvian public investment system Invierte.Pe, for a value of USD 2 437 481.

In order to guide the implementation of the most identified actions beyond the life cycle of the project, CATIE promoted, organized, trained and brought into operation the Management Committee for the Sub-basin of the Rio Shullcas. This committee was given tools that include: an assessment of the sub-basin, a management plan, the committee's operational statute and a document systematizing the experiences of CATIE.

Also, a geographic information system (GIS) was created, with a collection of maps that will help inform and support decision making about land use, intended to increase the resilience of the sub-basin of the Rio Shullcas. This information is available to the public on the geoserver of the Water and Environmental Engineering Institute's Water Center for the Andes at the National University of the Center of Peru, with which CATIE has an agreement.

All of the instruments and products developed by the project are available through the institutional portal <https://www.catie.ac.cr/climate-smart-territories-peru-proyect/>

Another important contribution is the incorporation of the Villa Rica Model Forest to the Ibero-American Model Forest Network (IAMFN), an initiative coordinated for several years by CATIE. The board meeting of the IAMFN was held in Lima, where the Equity and Gender Strategy was approved.



**Institutional
strengthening**

Institutional strengthening

Cutting-edge technology

The great technological development that has taken place recently has made it necessary for the institution to make efforts needed to strengthen its Technology of Information and Communication department. For example, we have established a new CATIE Virtual Room, which has a modern videoconferencing system and a space for production of high-quality audio and video.

Thanks to negotiations with Microsoft, we obtained the Microsoft Imagine program, which enables CATIE students and professors to use free licenses for their academic work, valued at more than USD 500 000.

In order to optimize its operating processes and have modern and efficient systems, a search has begun for a new ERP (Enterprise Resource Planning) software, which will replace the SIIF (Integrated System of Financial Information) that has been used for several decades.

Another important milestone in this area is doubling the Internet velocity (from 40 MB to 80 MB), which allows mail, navigation, telephone and conferencing services, among others, to operate more efficiently.

Finally, in the realm of telephony, CATIE has gone from Lync 2013 to a more professional and dynamic Skype for Business, and implementation of a digital telephone link called SIP TRUNK is almost completed, which will enable CATIE to reduce its telephone bill by 33%.

Improvement continues

In 2017, CATIE underwent an external evaluation process. The team was made up of representatives of the international/regional community, including specialists to cover four principal CATIE areas: education, research and dissemination, administration/finances and commercial activities. The results allow us to measure the degree of our institution's development, enabling us to take pertinent measures for improvement.

Office of Strategic Alliances

Since creation of the Office of Strategic Alliances in June 2017, mechanisms for close coordination have been established in order to maximize funding opportunities.

Our finances



Our finances

CATIE's new administration, which took office in March 2016, faced great challenges, including a financial and administrative review of the institution. Management has been focused on maintaining the levels of income and expenses within the approved budgets, having greater control and proper financial discipline, and adapting the operational and cost structure to current economic capabilities.

The financial results achieved a net surplus of almost USD 39 000—with reductions in income projected in the unrestricted core fund by almost USD 426 000 and the increase in costs of non-financial items (depreciations and others) by almost USD 122 000.

In 2017, CATIE's directors continue to work diligently to identify new sources of external funding, such as donations, scholarships, and agreements with partners, that ensure financial stability in the short and medium term.

Also, significant measures have been taken to maintain financial stability, enabling a net positive result of USD 9036 for the year 2017.

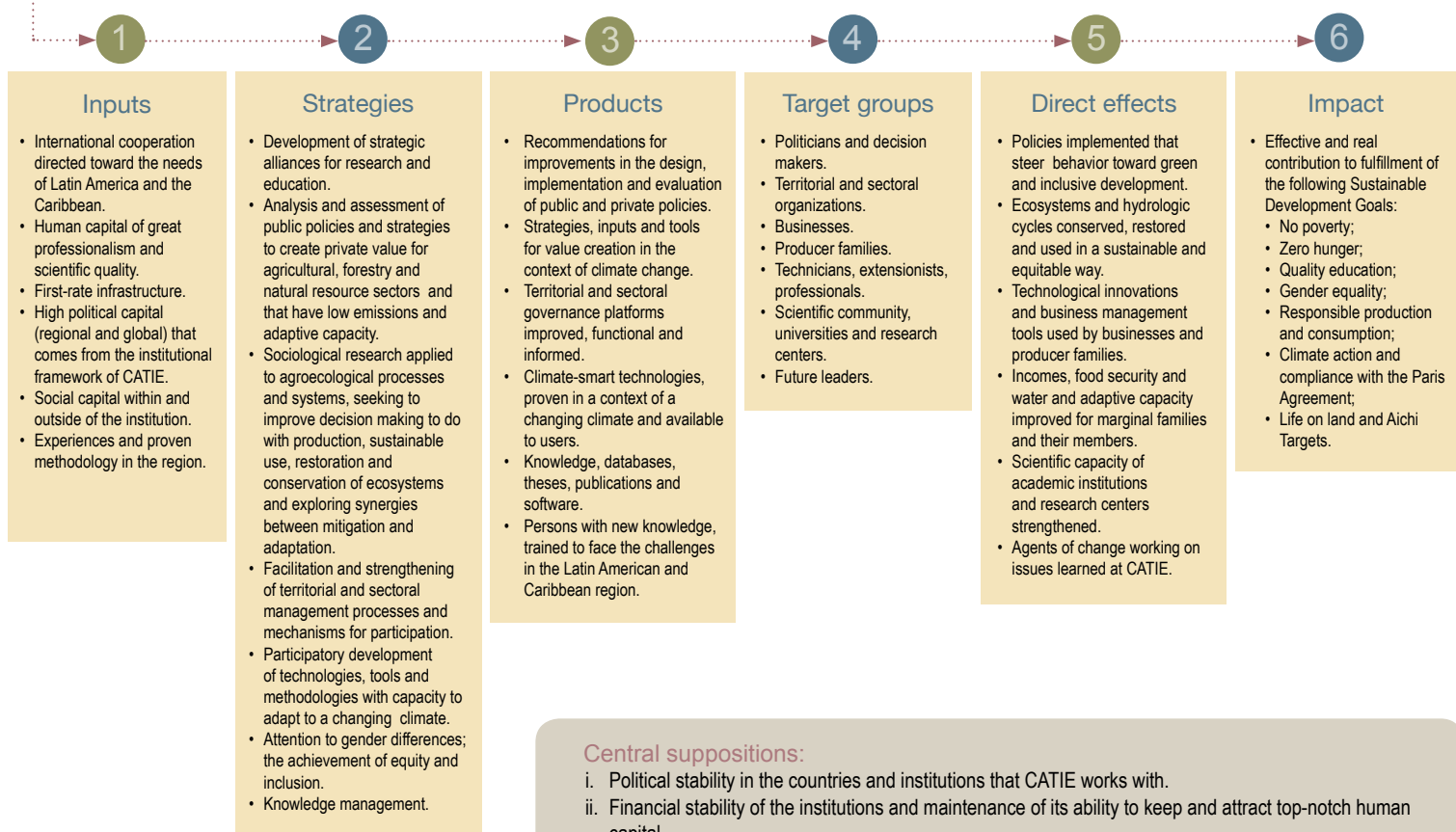
Determined efforts continue toward stabilizing funds managed as funds in custody, which provide financial support while funds are received from the donors. Thanks to these efforts, the deficit in these funds was reduced in 2017 by 13% (USD 130 000).



Appendix I. CATIE Theory of Change

Context

- Poverty and deterioration of rural livelihoods generate a growing vulnerability of rural populations
- Generational succession in rural areas, particularly related to family agriculture
- Social and gender inequality
- Growing deterioration of ecosystems and the provision of ecosystem services
- Strong changes in the climate and high climate variability
- Actions anchored in the framework of global conventions (UNFCCC, CBD, UNCCD, etc.)



Central suppositions:

- Political stability in the countries and institutions that CATIE works with.
- Financial stability of the institutions and maintenance of its ability to keep and attract top-notch human capital.
- The pattern of extreme meteorological events (for example, drought and floods) and biological events (for example, attacks by pests) behave within the parameters expected by the climate models.

The Tropical Agricultural Research and Higher Education Center (CATIE) is a regional center dedicated to research and graduate education in agriculture, and the management, conservation and sustainable use of natural resources. Its members include Belize, Bolivia, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Venezuela and the Inter-American Institute for Cooperation on Agriculture (IICA)

