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Report of Activities of Joint Collaboration

Between IICA and CATIE

San José, Costa Rica
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Report of Activities of Joint Collaboration

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During the year, the cooperation between CATIE and IICA continued to strengthen the areas of:

- Project implementation and proposal management
- Knowledge exchange and management
- Establishment of food banks

A. Implementación de proyectos y gestión de propuestas

1. Project implementation

1.1 Implementation of the PROCAGICA project

Within the framework of the Central American Program for Comprehensive Rust Management (PROCAGICA), CATIE, in its capacity as subdelegate, coordinated the component of capacity building, validation, and applied research aimed at serving small and medium coffee farms. Regional actions have been interactively coordinated with IICA, PROMECAFE, Consejo Agropecuario Centroamericano-CAC, CIRAD, ANACAFE, ICAFE, IHCAFE, INTA, CENTA CAFÉ, Consejo Salvadoreño del Café, MIDA-IDIAP and INDOCAFE with the following achievements between 2016 and 2021:

i) Strengthening and monitoring of regional and national research and transfer platforms in the comprehensive management of coffee rust. Under coordination with PROMECAFE and the national institutions in charge of monitoring the coffee sector, the collaborative research and transfer agenda was strengthened, generating information and organizational processes that allowed the implementation of different actions at the national and regional level in the seven countries involved. For 2017, a regional analysis of technology transfer systems was carried out, which allowed guiding the formulation of work plans in the different countries, helping to fill the gaps identified during PROCAGICA's years of operation. In a complementary manner, six master's studies were developed that contributed to the different topics related to the component. In addition, CATIE collaborated with CIRAD for the development of the PERGAMINO Platform, which allows the exchange of harmonized information and the forecast of rust risks and other associated socio-economic risks, from the Regional Early Warning Network for Risk Management in Coffee (https://www.procagica-rrat.net/inicio).

ii) Implementation of the network of research and demonstration plots in the field of producer families for the participatory validation of good practices in the context of integral pest management, with emphasis on rust and adaptation to climate change. The goal of 200 farms was met as scheduled for Guatemala, Honduras, El Salvador and Nicaragua. In a complementary manner, a network of 24 farms in Costa Rica was supported with support from ICAFE, MAG, FUNDECOOPERACIÓN / FONDO DE

ADAPTACIÓN and cooperatives from the COOCAFE consortium. The relevance of innovations such as: improved varieties, integrated control of pests and diseases, mechanization for the management of coffee shade, design and proper management of shade, windbreaks, selective management of herbs from the soil, bio-inputs, water harvesting and irrigation.

iii) Breed research and monitoring of coffee rust. A Regional Platform for Coffee Rust was created, which made it possible to consolidate the research capacity in the region (previously it depended exclusively on external support for the development of these studies), monitoring and implementation of actions to minimize the impact of rust. Laboratory infrastructure has been improved in the countries and protocols and methodologies have been implemented that have allowed the identification of new races of rust. Collaboration has been established for the exchange of materials and genetic improvement in coffee.

iv) Establishment of the network of clonal nurseries for the multiplication of improved materials of high productivity, quality and rusticity and low costs. These actions were implemented in Guatemala, Honduras, El Salvador and Nicaragua.

v) Preparation and distribution of 14 publications for technicians, producer families and decision-makers with the most important results on topics such as: good practices of integral pest management and adaptation, F1 coffee hybrids, improvements in management systems and pruning of coffee plantations, study and monitoring of rust races, among others.

vi) Courses, workshops and different events to strengthen the learning of the technical teams of the seven countries of the region. During the period, more than 44 national and regional events were held with more than 1665 participations (1259 men and 406 women). Among these events that strengthened regional technical capacity and training, the most important are:

- International Coffee Diploma, coordinated between CATIE, IICA, PROMECAFE and the coffee institutes of the region. Two editions were made in 2018 (support from IHCAFE) and in 2020 (with complementary direct support from ICAFE).
- Training of technical teams in clonal propagation techniques in micro cuttings to strengthen the mass reproduction of improved coffee varieties.
- Joint realization with PROMECAFE and coffee institutes of the XXIII Latin American Coffee Growing Symposium (Honduras, 2017) and the XXIV Latin American Coffee Growing Symposium (Guatemala 2019); where 12 technical-scientific papers were presented by CATIE-PROCAGICA.

1.2 Project agroforestry systems adapted for the Central American dry corridor - AGRO-INNOVA

CATIE established a sub-delegation agreement with IICA to implement the AGRO-INNOVA Project, the general objective of which is to contribute to improving climate resilience and food security in highly vulnerable households of small producers in Central America. Specifically, it is intended to improve mitigation and adaptation technologies to climate change to produce staple grains through public-private research, innovation and extension in multi-layer agroforestry systems (SAFM), in order to preserve the biodiversity of the seeds, increase productivity and improve food security for highly vulnerable families in the Dry Corridor of Central America.

Among the main results of the AGRO-INNOVA / CATIE-IICA Project, the following stand out; i) preparation and approval of the macro, meso and micro diagnoses for the six countries (Costa Rica, Honduras, Guatemala, El Salvador, Nicaragua and Panama); ii) maps based on geographic information systems and the recommendation to install 90 demonstration plots for the 36 territories in the six countries; iii) progress in the strategic planning of the Agroforestry Technical Committees (CTAF) in the six countries, in such a way that each CTAF already has a SWOT analysis and from there the following were determined: vision, mission, strategic plan and annual work operational plans; iv) preparation and approval of the final version of the Project baseline, which has begun to be filled in 30 of the 90 demonstration plots to be established; v) SAFM models were followed up in 10 food production plots in about 5 ha of CATIE-IICA land to support families with limited resources and affected by the COVID pandemic with horticultural products and vegetables. -19 in the municipalities of Turrialba and Coronado in Costa Rica; v) two toolboxes were developed with 20 innovations for the strengthening of capacities in the sustainable production of multilayer agroforestry systems with the participation of two companies contracted for this purpose (one in Guatemala and the other in Costa Rica); and vi) all the administrative, logistics and contracting actions already established continue to be carried out in order to ensure the achievement of the Project objectives and to comply in the best way with the operational plans on time, as well as the smooth running, transparency and execution of the activities and associated budgets to guarantee the desired impact on the 3,000 target producers of the Dry Corridor of the six Central American countries within the framework of the AGRO-INNOVA project.

1.3 Innovation Program in Agricultural and Agroforestry Technology (PITAG)

CATIE and IICA implement Component 2 for the Ministry of Agriculture, Rural Development and Natural Resources (MARNDR) of Haiti: Promotion of sustainable agricultural technologies by financing the adoption of innovative, profitable and sustainable agricultural technologies that improve the profitability of the long-term farms, generate positive environmental externalities and facilitate climate change mitigation and / or adaptation.

The objective is to strengthen the capacity of providers of agricultural goods and services authorized by PITAG, so that they can provide adequate technical advice to farmers benefiting from the incentives.

The main expected results are aimed at achieving capacity building, so that suppliers know and master the techniques and tools to provide quality agricultural goods and services in their respective field of activities, in the following topics: i) animal traction and oxen use training; ii) operation and maintenance of irrigation pumps; iii) grafting and pruning techniques; iv) quality standards for agricultural inputs and services; v) quality standards for agricultural inputs and services; vi) techniques for the production of yam seedlings from mini cuttings and from healthy banana seedlings; vii) quality standards for soil preparation services; viii) compost making; and ix) management of agricultural goods or services companies.

The progress made by the IICA-CATIE Consortium to develop technical services aimed at "Training providers of agricultural goods and services" are as follows: i) coordination with the IICA Office in Haiti to update the work plan; ii) elaboration of the detailed planning for carrying out the trainings in the zones and for the respective blocks, for 80 professionals; and iii) execution of the first training activities in the north and south of Haiti.

1.4 Project Biodiversity and Sustainable Agrosilvopastoral Livestock Landscapes (BioPaSOS)

BioPaSOS is implemented by CATIE and IICA, in coordination with the Secretariat of Agriculture and Rural Development (SADER) and the National Commission for the Knowledge and Use of Biodiversity (CONABIO), the latter two from Mexico. This project is funded by the International Climate Initiative (IKI) and the Federal Ministry for the Environment, Nature Protection and Nuclear Safety (BMU) of the Federal Republic of Germany.

Currently, it continues with the work in the territories of action: Jalisco, Campeche and Chiapas. The actions are grouped along the lines, according to the POA 2020 of CATIE's GAMMA Unit: i) three learning platforms established and consolidated in the project's territories of influence (Jalisco, Chiapas and Campeche); ii) three working groups developing research agendas, one per territory; iii) three operational groups working closely with the Territories of Agriculture with the objective of promoting sustainable cattle ranching and influencing state policies; iv) three established networks of parcels for research and monitoring on sustainable livestock issues, one per territory; v) a geospatial database with the ranches participating in the project; vi) three databases of water footprint monitoring in livestock landscapes; vii) three C monitoring databases on cattle ranches; viii) an analysis document on livestock value chains in the project's territories of influence; ix) a toolbox specialized in sustainable livestock production issues; x) scripted manual to facilitate learning sessions with livestock producers; xi) document with the systematization of successful experiences of technology transfer in Mexico and Latin America; xii) a scientific article on C storage submitted to a peer-reviewed journal; xiii) three established learning communities; and xiv) 68 Graduate Field Schools in the three States (1231 producers trained in issues of good livestock production practices, biodiversity conservation and climate change, among others [70% men and 30% women]).

1.5 Diagnosis of the Milk Value Chain in Guyana

The IICA Representation in Guyana invited CATIE so that some of its technicians work with those of IICA in the development of the study "Diagnosis of the Milk Value Chain in Guyana (mapping, analysis and design). The work initially scheduled for the second half of 2020 had to be postponed due to the COVID emergency, but there is a proposal to resume work in the coming months. CATIE professionals will be responsible for analyzing existing dairy production systems in Guyana and proposing options for improving primary productivity and resilience to climate change along the value chain, the characteristics of the dairy chain, the interactions between the different actors and opportunities to improve the infrastructure and organization to ensure the provision of quality and safe milk to consumers. The study also considers proposing mechanisms to strengthen innovation systems in the dairy chain.

2. Nuevas propuestas

2.1 New proposals

CATIE, together with IICA, are participating in the preparation of a joint proposal for IDR: "Collaborative One Health Research Initiative on Epidemics" (COHRIE), for a value of CA $ 5,000,000.00

For this purpose, a concept note was presented on April 5, with favorable results to move to a second phase (full proposal stage). We are working on the proposal entitled "MErgIng: A multi-disciplinary perspective to

Managing Environmental, Institutional, and socioeconomic determinants to prevent and control infectious epidemic zoonotic threats in South America". With intervention countries in Peru and Colombia. Our partners in the consortium: IICA, main partner, contact person: Jaime Romero, with support from Karen Montiel. Operating partners: Universidad Peruana Cayetano de Heredia + Universidad La Salle (Colombia).

As part of the process, meetings are being held to define the work topic: rabies disease in the territories of San Martín (Peru) and Casanare (Colombia), probably leishmaniasis is also included as part of the proposal, but with more limited actions . Key partners are identified to request letters of support both at a technical and political level, which will give us greater support in the proposal. It is coordinated with the representatives of Catie, IICA, partners of the universities.

B. Knowledge exchange and management

1. Symposium "Trends and Opportunities to Promote Agricultural Innovation in Bolivia"

CATIE participated between March 9 and 10, 2021 in the Virtual Symposium on "Trends and Opportunities to Promote Agricultural Innovation in Bolivia", organized by the National Institute of Agricultural and Forestry Innovation (INIAF) of Bolivia and the Inter American Institute Cooperation for Agriculture (IICA). At the event, Dr. Reinhold Muschler, from CATIE's Latin American Chair of Agroecology and Agrobiodiversity, presented the conference entitled "Edible and functional agrobiodiversity: underutilized species to improve human nutrition and increase resilience to climate change."

2. Peru internships

CATIE-IICA cooperation activities in Peru from 2020 to date are:

2.1 National awarding competition for the quality of agricultural innovation projects- INIA-Caral 2020. MINAGRI-INIA-PNIA-IICA.

Objective: to promote agricultural innovation by documenting, disseminating and awarding successful cases of innovations carried out in Peru in the last 20 years.

i) CATIE supported through Hugo Li Pun, Danilo Pezo and Roberto Quiroz.
ii) IICA supported through Luis Morán, Viviana Palmieri, Pedro Rocha, Kelly Witkowski, Daniel Rodriguez, Orlando Vega, Joao Torrens and Fátima Almada.

Main results:

i) 20 selected and documented cases of innovations in small and medium agriculture that have directly and indirectly benefited more than 250,000 families.
ii) 8 outreach events co-organized between IICA and CATIE, with moderators and panelists from CATIE and IICA. A total of 3,431 participants and 37,139 views on FB and YouTube.
iii) A MIDAGRI publication with the 20 winning cases and lessons learned from the cases.
iv) Training activities for Peruvians at CATIE co-organized with IICA:
- Internship: Agroforestry Systems and Pest and Disease Control. INIA-PNIA-IICA-CATIE. US $ 29,537 (12 participants).

- • Program to strengthen capacities for INIA technicians. INIA-PNIA-IICA-CATIE. US $ 26,950 (34 participants).
- • Internship: Agroforestry and cocoa systems. US $ 31. 354 (13 participants).
- • Group Internship at COOPAGRO-Café. US $ 20. 518 (10 participants).
- • Group Internship at COOPVAMA-Cacao US$ 22. 012 (9 participants).
- • Individual internships for Peruvian professionals. 1 to 5 months. PNIA. US $ 94,216 (13 participants).

3. International Week of Tropical Agriculture (AGRI-Trop)

CATIE collaborated with IICA at AGRI-Trop to make a presentation on: Productive and low-carbon tropical meat and dairy systems.

4. Weather week

Catie collaborated with IICA and FAO on a panel discussion at a side event: Livestock an opportunity to improve climate action in LAC.

5. Launch of the manual "Trees and emblematic palms of the Americas"

Among the actions of the IICA-CATIE Joint Unit, the preparation of publications and technical documents was identified. As part of these documents, the first publication in Spanish and English was the Emblematic Trees and Palms of the Americas manual. The general objective was to support the preparation of a catalog with a description of the forest species and emblematic palms of the 34 IICA member countries in the American continent, which, for different reasons, the countries called them national trees or palms. These publications may be used to promote sustainable use and conservation, motivating and inspiring to give more impetus to arborization in the Americas.

6. Joint IICA-CATIE launch of the brotherhood forest´initiative

Since the end of 2019, an agreement was reached between the General Directors of IICA and CATIE to promote a forestry initiative for the brotherhood of both institutions to be developed in the "Forest Park of the Americas of IICA" and the planting of trees in the parking car at the IICA facilities in Coronado, Costa Rica. This initiative also aims to establish representative trees of the countries that integrate IICA and also to influence the improvement of the environmental conditions of the Coronado Municipality. The establishment of national trees or trees with cultural value for the inhabitants of each country within the scope of IICA has been prioritized. Through the arborization of the parking areas, tree species with scenic beauty will be established and managed that provide adequate shade for vehicles and, in addition, that do not lift the pavement with their roots.

Due to the COVID19 pandemic in 2021, the actions carried out at the end of 2019 and the beginning of 2020 were re-taken, which consisted of carrying out a diagnosis of the ecological, silvicultural, phytosanitary and spatial-structural variables in the trees of the IICA campus. In addition, a technical and financial

proposal on tree management was prepared. The establishment of suitable and attractive tree species was also recommended for the conformation of the Parque de las Américas, as well as for the parking areas.

The intervention of the trees that are currently on campus and require cutting or pruning, as well as the establishment of new tree species, is pending.

7. IICA and CATIE joint proposal on the evaluation of the modernization of the Orton Library

The two Directors from IICA and CATIE had several meetings to analyze the proposal to modernize the Orton Library to make it more functional and use modern tools to provide information to the clients of both institutions. Countries are expected to be able to access up-to-date information online based on evidence from related sciences.

8. Bilateral agreement for cooperation between IICA and CATIE

It is important to note that the bilateral agreement expires this year, and the two organizations are working on the renewal of this agreement, considering the lessons learned and the demands of the countries. The proposed activities are considered in the strategic plans of each country, considering the issues that need to be strengthened in the food systems. It is expected that technical cooperation, project management and implementation will be strengthened. There is also a plan to strengthen CATIE by increasing cooperation with IICA and considering innovative business models for the financial sustainability of the center.

9. Master plan for investment

The latest resolution of the IABA (519) asked IICA and CATIE to work on a master plan to make the lands where CATIE operates more productive. Likewise, the socioeconomic context of the region and its opportunities were analyzed. Based on this analysis, an investment plan was developed.

C. Establishment of food banks

As part of an agreement between the Directors General of IICA and CATIE and with the support of the European Union, SAFM models were established in 10 food production plots in about 5 ha of CATIE-IICA land to support families with Limited resources that have been affected due to the COVID-19 pandemic in the cantons of Turrialba and Coronado in Costa Rica with food resources of good nutritional quality. Within these plots, a comprehensive agrobiodiversity module was developed that includes a multi-layer agroforestry garden with the production of vegetables, fruit trees (citrus, papayas, bananas, plantains, avocado and others), timber species, forage, pasture and a goat module with six goats that contributes organic matter to the garden, produces pasteurized milk, yogurt, fresh cheese and other by-products.

Table 1 summarizes the list of crops by effective area and lot (corn, cassava, beans, beans and sweet potato, among others) for families in the cantons of Turrialba and Coronado vulnerable by the COVID-19 pandemic, as well as worked with students from CATIE's Graduate School at the Integrated Pest Management site where vegetables, fruits, other vegetables and a goat module have been established.

Table 1. Lots, area and general description of the sites that make up the CATIE - IICA food bank to support families with limited resources and affected by the COVID-19 pandemic.

Lot	Area m²	Crops in agroforestry association
1. Maxi Pali	10875	Sowing in blocks of white corn (*Zea mays*), red beans var. guaria and black bean (*Phaseolus vulgaris*), in an agroforestry system that integrates species such as poró (*Erythrina berteroana*), laurel as a timber tree (*Cordia alliodora*).
2. RTT plantation	9505	Lot with commercial squash Naranjo F1 (*Cucurbita argyrosperma*), in a system with *Pinus caribaea, Eucalyptus deglupta* and *Araucaria houstein*.
3. Chilindrina	2131	Cassava and sweet potato were established in a system that integrates species such as black wood (*Gliricidia sepium*), *E. poeppigiana* and cedar (*Cedrela odorata*) in boundaries.
4. Phytoprotection Diversified Agroforestry Garden. It also serves as a nutritional garden, with the integration of the components of the goat module.	1200	This area has served as a learning site for master's degree students from the agroforestry planning course. After a biophysical diagnosis, a proposal was made for the design of an orchard where species such as avocado (*Persea americana*), wild garlic (*Allium tuberosum*), basil (*Ocimum basilicum*), arracache (*Arracacia xanthorrhiza*), banana (*Musa* AAA) were established. Gros Michell (Cavendish); squash (*Cucurbita moschata*), aubergine (*Solanum melongena*) sugar cane (*Saccharum officinarum*), turmeric (*Curcuma longa*), chayote (*Sechium edule*), sweet pepper (*Capsicum annuum*), Panamanian pepper (*Capsicum chinense*), spinach (*Spinacia oleracea*), beans (*Phaseolus vulgaris*), stick beans or pigeon peas (*Capsicum chinense*), guava (*Psidium guajaba*), soursop (*Annona muricata*), ginger (*Zingiber officinale*), lettuce (*Lactuca sativa*), Mandarin lemon (*Citrus limonia*), sweet corn (*Zea mays* var. rugosa), cucumber (*Cucumis sativus*), pineapple (*Ananas comosus*), cherry tomato (*Lycopersicum solanum* var. cerasiforme), mustard (*Brassica juncea*), cape gooseberry (*Physalis peruviana*) , lemon grass (*Cymbopogon citratus*), zucchini (*Cucurbita pepo*) and cedar timber trees. In addition, a goat module was established with six goats producing milk.
5. Lot "La Pastera"	568	Corn (*Z. mays*) was planted interspersed with red beans var. guaria (*P. vulgaris*), in a site near the dairy with fences of nacedero (*Trichanthera gigantea*) as forage species and in the future mahogany (*S. macrophylla*) will be incorporated in boundaries.
6. Alex Lot	1809	The land is divided into blocks of cassava (*Manihot sculenta*), sweet potato (*Ipomoea batatas*), banana and plantain (*Musa AAB*), with fences of nacedero (*T. gigantea*) as forage species and in the future mahogany (*S. macrophylla*) in boundaries.
7. Silvopastoral Dinghy	662	Pasto Cuba 22 (*Pennisetum purpureum* cv OM 22) and Vainica and Mahogany will be incorporated in boundaries.
8. Entrance to Livestock	2210	Lot of sweet corn (*Z. mays*) and banana (*Musa* AAB) (30 plants) with tucuico (*Ardisia revoluta*) with star grass (*Cynodon nlemfuensis*), guava trees (*Psidium guajaba*) and forage bank of buttercup (*Titonia diversifolia*).
9. Llama Lot	10217	Sweet potato, banana, yucca, pigeon pea and mahogany
10. Raleigh House	2571	Plot with banana, interspersed with white corn, forage bank of poró and forage peanuts (*Arachis pintoi*). It is considered to set hemstitches, poró and mahogany.

As can be seen in Table 2, from June 2020 to March 2021, a total of 320 squash units, 32 banana bunches, 164 kg of hemming, 1875 kg of sweet potato, 39 banana bunches, 80 kg beans, 1014 units of mandarin, 1170 units of orange, 3152 kg of cassava, 127 kg of corn and 2570 elotes have been delivered to beneficiaries of the Home for the Elderly of Coronado, as well for the Rodolfo Herzog school of La Suiza - Turrialba, for the care center and child development of El Eslabón - Turrialba and 1,493 vulnerable families from both municipalities.

Table 2. Registration of food delivered to families with limited resources and affected by the COVID-19 pandemic in Turrialba and Coronado between June 2020 and March 2021.

Coronado											
Period	**(OR)**	**Banana (R)**	**Vainica (kg)**	**Sweet potato (kg)**	**Banana (R)**	**Beans (kg)**	**Mandarin (U)**	**Orange (U)**	**Cassava (kg)**	**Corn (k)**	**Elotes (U)**
June-Sep 2020	55	1	25	0	8	0	0	0	1440	0	875
Oct Dec 2020	51	29	20	287	17	20	600	570	31	127	0
March 2021	0	0	0	420	4	0	0	0	456	0	0
Total	**106**	**30**	**45**	**707**	**29**	**20**	**600**	**570**	**1927**	**127**	**0**
Turrialba											
June-Sep 2020	60	0	53	350	0	0	0	0	460	0	1650
Oct Dec 2020	0	0	66	418	3		414	600	365	0	
March 2021	154	2	0	400	7	60	0	0	400	0	920
Total	**214**	**2**	**119**	**1168**	**10**	**60**	**414**	**600**	**1225**	**0**	**2570**
Big total	**320**	**32**	**164**	**1875**	**39**	**80**	**1014**	**1170**	**3152**	**127**	**2570**