

Info Note

Production models and technical assistance towards sustainable livestock in the department of Caquetá

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KEY MESSAGES

- The Colombian department of Caquetá has particular economic, social and environmental characteristics, which make it eligible for agricultural sustainability projects that increase productivity, promote climate change mitigation and resilience, and reduce deforestation through sustainable intensification.
- Within the framework of the Development Programs with a Territorial Approach (PDET) Routes for Stabilization, program of the European Fund for Peace, 6.3 million euros in financing was obtained. The livestock component will benefit 370 production units (farms), 560 hectares and 540 mainly small and medium-sized producers.
- Production models and technical assistance are aimed at increasing the yield per dairy cow and, additionally, generating enabling conditions for the future certification of the farms in good cattle raising practices.
- Production models and technical assistance are carried out under a participatory design approach in which the producer and his family are decisive actors in the technological strategies for the system and landscape improvement.
- Recognition of women and young people as key stakeholders in livestock farming, another focus of this program enhances the capacity for improvement and sustainability.
- The work of the Alliance of Bioversity-CIAT and CCAFS has identified and validated appropriate mitigation practices for the livestock sector that can be included in a technical assistance model in tropical countries.

This info note summarizes the objectives, scope, and intervention logic of the livestock component of the PDET Routes project, which is implemented in four municipalities in Caquetá. The conditions that converge there, such as the high and growing rate of deforestation, environmental impacts, productive orientation, and types of land tenure, enable the implementation of sustainable livestock production models and the development of technical assistance programs in the productive, economic, social, and environmental spheres.

Context

According to information provided by the National Cattle Census (ICA, 2021), the department of Caquetá, with 2,079,194 head of cattle, ranks fifth in Colombia's cattle population, surpassed only by Antioquia, Meta, Córdoba, and Casanare. This situation is particularly relevant if one considers that in these first departments the main orientation is meat production and only two of them are mainly oriented to dairy and dual-purpose (dairy and beef production) (Antioquia and Caquetá). In addition, 40% of Caquetá cattle farms are considered small because they have less than 50 cattle, an aspect that is not irrelevant from a social and food security point of view, since a significant percentage of the milk produced daily is destined for self-consumption.

What undoubtedly highlights Caquetá as an area of interest for the implementation of sustainable livestock production models and technical assistance towards sustainability is its importance in the national greenhouse gas (GHG) inventory and the pressure exerted by its productive matrix on the ecosystem, as evidenced by the deforestation rates recorded in recent decades. According to the national and departmental GHG inventory (IDEAM, 2016), cattle ranching in Caquetá, with emissions of 1.84 Mton CO₂eq annually, is responsible for



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9% of departmental GHG emissions, a relatively low value when compared to some departments with a cattle ranching tradition; however, the particularity of its inventory lies in the fact that the two activity categories that lead it are *Carbon balance of natural forest converted to other forest land (deforestation)* with 11.23 Mton CO₂eq and *Natural forest converted to pasture (deforestation)* with 5.36 Mton CO₂eq. Both categories account for 83.6% of the department's total GHG emissions. This suggests that more than an intrinsic problem of livestock production *per se*, there is a conflict in the dynamics of land tenure and use, land use and productive management that has not been effective.

The deforestation rate in Caquetá is the highest in the country and corresponds to an alarming 22% of the national total (IDEAM, 2016). Deforestation is caused by the pressure of various economic activities on the department's ecosystems, including the presence of illicit crops, illegal mining, and agricultural and livestock activities, illegal land grabbing, among others. Although this significant loss of forest cover has been evident for several decades (Figure 1), recent years have been critical due to phenomena such as the signing of the Peace Accord in 2016, the opening of legal and illegal roads between jungle villages (WWF, 2020) and weak regulation and presence of the State on issues concerning the sustainable use of natural resources (Clerici et al., 2020), among others.

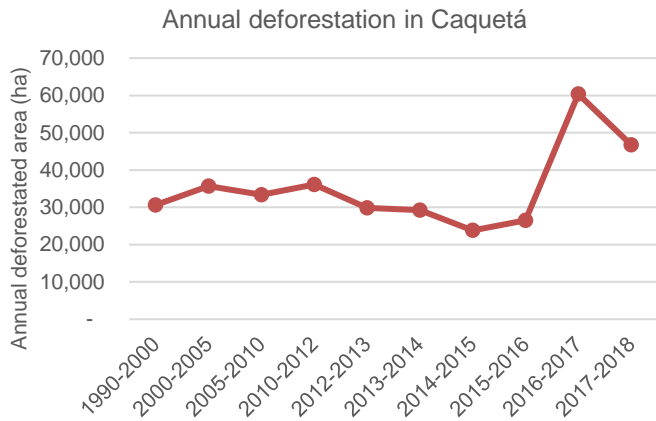


Figure 1. Hectares deforested annually in Caquetá. Source: Forest and carbon monitoring system (SMBYC) (IDEAM, 2020).

It could be inferred then that the significant forest cover of the department (71.7% of the territory as of 2018), would allow the department of Caquetá to have a high carbon sequestration capacity. While this is true in absolute terms (1.23 Mton CO₂eq absorbed annually), its removals barely compensate 6.2% of the departmental gross emissions since the natural forest regeneration category

¹ Joint construction with delegates from UPRA and MADS in meetings held on the following dates: September 21, 2016, October 19, 2016,

is the one that contributes the least removals to the department and the one that potentially has the greatest capacity to sequester carbon. There is still a long way to go (93.8%) to achieve carbon neutrality in the economic matrix of the department of Caquetá.

According to the Agricultural Rural Planning Unit (UPRA, 2018) the territory of Caquetá is mostly located outside the Agricultural Frontier, which is "the limit of rural land that separates areas where agricultural activities are allowed, from protected areas, those of special ecological importance, and other areas where agricultural activities are excluded by mandate of law or regulation" (UPRA, MADS, 2017)¹. This condition means that Caquetá, together with five other departments, represents part of an agro-environmental enclave corresponding to territories transformed with agricultural activities, immersed in predominantly natural ecosystems, which require differentiated environmental and agricultural management for their sustainable development and stabilization, considering the criteria of agro-environmental zoning. However, the actual land use in its territory is far from respecting this frontier; in this regard, deforestation in Caquetá has had a high impact outside the Agricultural Frontier, especially in the last decade (Figure 2).

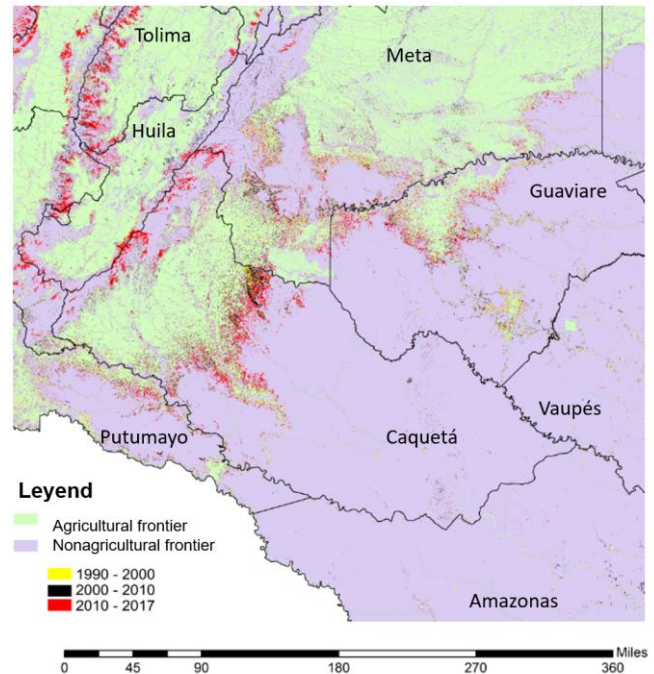


Figure 2. Deforestation outside the Agricultural Frontier (AF) in the southeastern region of Colombia. The yellow, black and red dots mark the deforested areas outside the AF up to the years 2000, 2010 and 2017, respectively. Source: data taken from UPRA (2018) and SMBYC (IDEAM, 2020).

March 16 and 31, 2017, May 9 and 26, 2017, June 5, 2017 and October 24, 2017

Departmental livestock productivity

Notwithstanding the aforementioned scenario, livestock and mainly dual-purpose livestock undeniably represents an important economic activity for the department and a substantial source of employment for its inhabitants (DANE, 2018). The National Agricultural Survey (ENA, DANE, 2020) reported 19,055 Units with Agricultural Production (UPA), of these, 19,000 UPA are engaged in cattle raising, hence it is a constant object of improvement, as the social engine that it has been in recent years and a source of income for families that directly and indirectly depend on this value chain.

Caquetá is among the departments with the highest milk production, even though its orientation is not mainly specialized but dual purpose, which is characterized by raising calves next to their mother or wet nurse, obtaining milk directly from the udder or from the milk left over from milking. The departments with the highest milk production according to the ENA (2019) were Antioquia, Cundinamarca, Boyacá, Caquetá, Nariño and Magdalena with 5.09, 3.78, 1.94, 1.63, 1.14 and 1.12 million liters per day and shares of 23.3%, 17.3%, 8.9%, 7.5%, 5.2% and 5.1% respectively. This is a relevant indicator, since Caquetá is the only department listed as totally oriented to dual-purpose production; the others are specialized dairies in most of the territory and additionally have mixed orientations. (Figure 3).

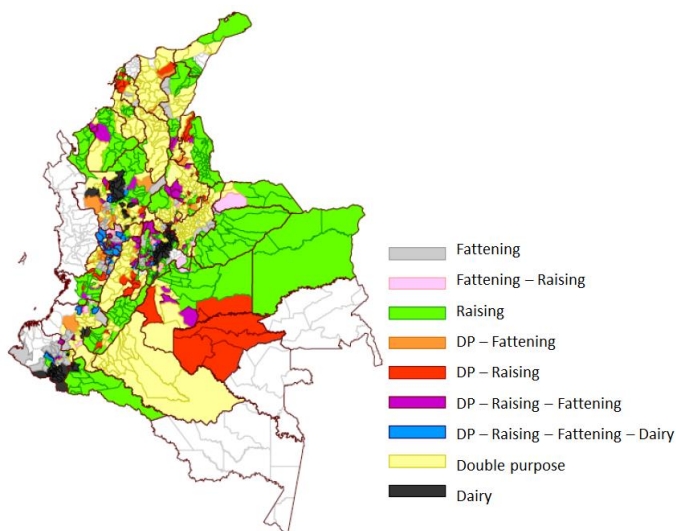


Figure 3. Orientation of the cattle herd in Colombia. Source: Colombian Cattle Raisers Federation (Fedegán) and the National Livestock Fund (FNG) (2018).

However, despite the important livestock conglomerate that the department of Caquetá represents, its productive indices continue to be deficient: first, the land resource is being used inefficiently, at a rate of approximately 0.7 head of cattle per hectare. Additionally, daily milk production in dual-purpose systems is 4.5 liters per cow,

and in specialized dairy systems it is 8.6 liters per cow (CDGC, 2019), translated into a daily production of 1.63 million liters per day, which is around 7% of the national product. These indicators not only show the production gap that exists with respect to departments with higher daily milk production per milking cow, but also highlight the work potential and the capacity for improvement in extensive systems through the implementation of productive technologies and behavioral changes in the systems.

One reason that may partially explain this low productivity and high inefficiency per unit area may be the scarce technical assistance and the low level of investment in sustainable production technologies; an example of this is the lack of tree cover in cattle-raising areas in Caquetá and other departments of the country (Figure 4). This type of production under monoculture conditions has proven to be not very resilient to climate variability and change, which results, with a higher probability, in economic losses due to the increased frequency and intensity of floods and droughts. (Tapasco et al., 2015).

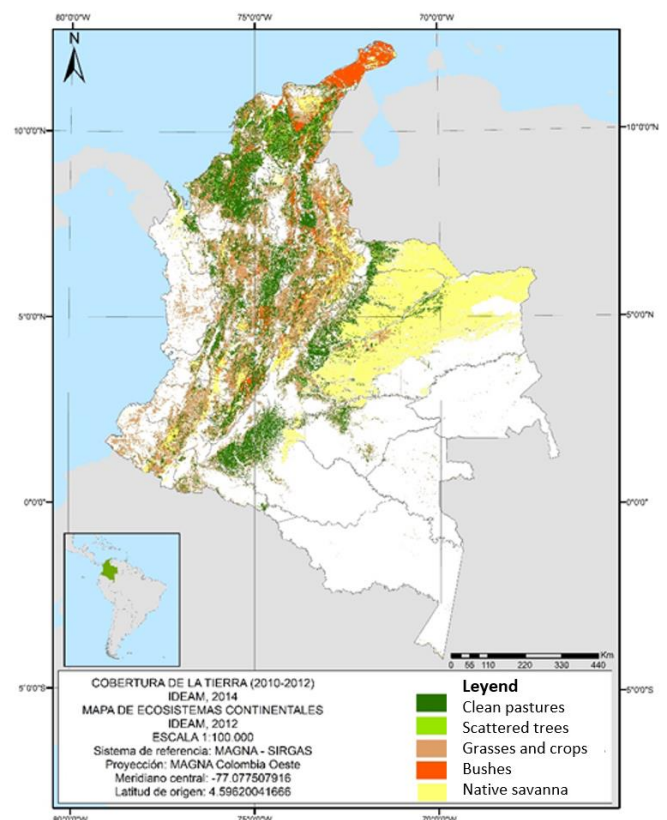


Figure 4. Land cover associated with livestock production. Source: data taken from IDEAM (2012; 2014)

Initiatives for sustainable livestock production

All these productive and environmental conditions described above have motivated a high level of investment interest in projects to promote sustainable livestock production and conservation in the department. This is the case of the Caquetá Connected Landscapes project (2013 - 2020) by Fondo Acción and the United States Agency for International Development (USAID), with the objective of halting forest degradation and disappearance by strengthening local governance, promoting sustainable livelihoods, and preparing to receive payments for environmental services linked to forest conservation. (Fondo Acción, 2020). In addition, there are initiatives by associations such as Queso del Caquetá (2021), whose goal is to promote the activity of formal cheese producers while making this product visible through seals of origin and promoting sustainable cheese production that is not linked to deforestation processes. This initiative is still underway and represents a promising business model that can be replicated in other regions, as it not only vindicates producers as relevant actors in the chain, but also provides a differentiated value to products from systems with sustainable practices and without deforestation.

In addition, in a public-private initiative, the livestock producers' union signed in 2019 the Caquetá Pact "for zero deforestation and livestock reconciliation". This is an agreement of wills for environmental improvement through actions of restoration, recovery, conservation and implementation of sustainable systems to preserve biodiversity in the livestock systems of Caquetá. (CDGC, 2019).

For the last five years, the Alliance of Bioersity International and the International Center for Tropical Agriculture (CIAT) have worked with The Nature Conservancy (TNC), the Center for Research on Sustainable Agricultural Production Systems (CIPAV) and the Colombian Federation of Cattle Ranchers (Fedegán) in drafting the Nationally Appropriate Mitigation Actions (NAMA) for sustainable livestock production. This is a roadmap for the achievement of climate change mitigation objectives in this specific sector, as part of the commitments adopted upon the United Nations Framework Convention on Climate Change and to provide a basis for the Nationally Determined Contributions (NDC) to ultimately help fulfill the Colombian agreements as part of the Paris Agreement.

The department of Caquetá is in a high priority position (Figure 5) to achieve compliance with these commitments due to its relevance within the national cattle herd, as well as its GHG mitigation potential in all possible investment

scenarios, through the implementation of improvements in knowledge management, management practices and technologies such as silvopastoral systems, dispersed trees in pastures and live fences.

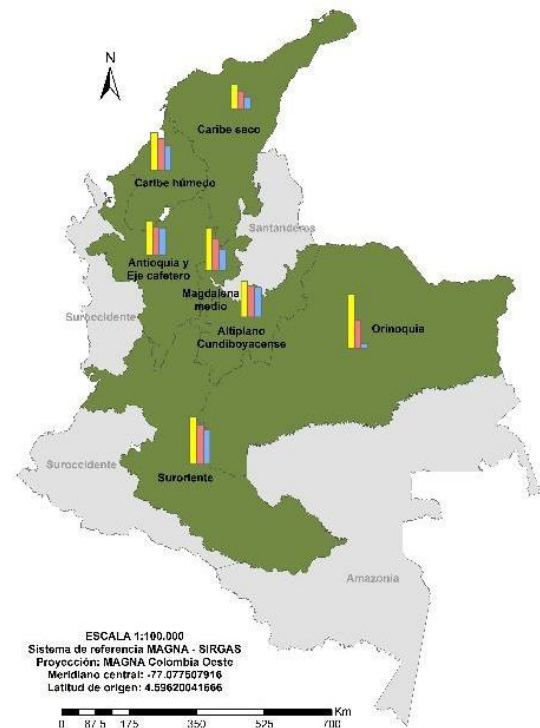


Figure 5. Areas prioritized by the NAMA for sustainable livestock production in Colombia. Prioritized regions are shown in green. The bars within each region represent the GHG emissions scenarios: the yellow bar illustrates current emissions, the red bar, emissions in a moderate scenario to 2030 and the blue bar, optimistic emissions in 2030. Source: NAMA, 2021.

PDET Routes program

The PDET Routes program seeks to contribute to the process of territorial stabilization through the inclusive and sustainable strengthening of the dairy chain and improved access to resources, services, infrastructure and markets. Its main objective is to contribute to the improvement of productivity, competitiveness and sustainability in the department of Caquetá through the provision of public goods and products identified by the communities, business strengthening, applied innovation and inclusive alliances within the dairy chain.

This is a complementary intervention of the European Fund for Peace in Colombia focused on the PDETs, which are part of the comprehensive rural reform contemplated within the Framework Plan for the implementation of the final agreement, led by the High Presidential Advisory Office for Stabilization and Consolidation, and with the support of the Land Renewal Agency (ART in Spanish). The project has a significant counterpart contribution from the Government of Colombia (from different sources, ART, FCP, OCADPaz

and others) for a total financing of 6.3 million euros, divided between the cocoa chain and the dairy chain. The project will be implemented over a four-year period under 3 grant contracts with: ADELCO Network², ICCO³ and the Alliance of Bioversity International and CIAT. These institutions are characterized by their presence in the territory, their experience and knowledge in local development and research, and their technical and administrative competence and suitability. There are numerous relevant stakeholders and institutional allies at the national and territorial levels, such as cattle ranchers' committees, local boards, and suppliers, among others.



Figure 6. PDET Routes Program logo

The specific actions of the project are directly related to the dairy routes of the selected municipalities: El Paujil, San Vicente del Caguán, La Montaña and Puerto Rico in the department of Caquetá, and the following indicators and goals have been defined in this regard:

1. 370 sustainable livestock systems co-designed and implemented.
2. 560 hectares with successful implementation of forage technologies or other sustainable practices in livestock systems.
3. Increase daily milk production per cow by at least 15%.
4. 370 producers will receive training in good livestock husbandry practices (GHP), providing enabling conditions for obtaining certification.
5. 540 producers will be trained in the selection, management and establishment of improved fodder.
6. At least 20% of the beneficiaries will be women seeking to improve their agricultural or livestock practices.
7. At least 80% of the beneficiaries will sign voluntary sustainability agreements and will be in the process of implementing them.

² ADELCO Network: National Network of Local Economic Development Agencies



Figure 7. Implementation municipalities, Red dots: La Montaña, El Paujil, Puerto Rico, San Vicente del Caguán.

Co-design of livestock systems based on forage technologies and silvopastoral systems.

The team from the Alliance of Bioversity International and CIAT have placed special emphasis on overcoming the technical and communication barriers between the research centers and the end users of the technologies, who are the agricultural producers; for this reason, in recent years they have worked to implement the participatory design methodology for sustainable production systems, which provides equal participation to all the actors involved in the chain towards the achievement of clear and measurable objectives. This methodology considers the objectives of the producers which, together with the technical capacity of the assistants in the regions, crystallize into realistic and sustained implementations over time.



Figure 8. Baseline survey and exchange of knowledge with producers. Photos: J. Ortiz and A. Chindicué. Sept 2021

³ ICCO-Cooperation: Interchurch Organization for Development Cooperation of the Kingdom of the Netherlands

The assistance model is based on joint capacity building, in which the farmer assumes his role as the main actor in the chain and the technical assistant accompanies him in achieving these objectives. The proposed technologies include silvopastoral systems of different densities, but also include the incorporation of improved forage, division of paddocks, scattered trees in paddocks, live fences, among other technologies. The generation of capacities around the critical control points of the Colombian Agricultural Institute (ICA) is also contemplated so that producers can begin to pave the way for future certification in good livestock practices.



Figure 9. Implementation of nurseries for the propagation of forage material. Photo: J. Ortiz. Nov 2021.

An implementation follow-up diagram will provide an overview of each of the implementation activities described in the establishment protocols resulting from the co-design. This diagram was developed based on experiences acquired in Caquetá by the partner institution CIPAV. (Figure 10).



Figure 10. Diagram for monitoring the implementation of sustainable livestock production models.

CIAT is a pioneering institution in tropical forage and livestock production research and its relationship with the environment, with extensive experience in providing technical assistance services and in building and strengthening agricultural capacity, evaluating on-farm potential, developing management plans, and measuring the environmental, economic, and social impacts of proposed production systems.

The role of women in the value chain

Historically, the contribution of women in the dairy chain and in agricultural production systems in general has been invisible and insufficiently recognized, which affects their active status in the different links and leads to wasting their potential to develop more solid and efficient chains (Triana & Burkart, 2019).

In its Special Report⁴, the Kroc Institute makes a statement on the gender approach in the implementation of the Peace Agreement, pointing out that one of the challenges is to improve the representation of women's organizations in the PDET processes, especially in the spaces where the final decisions are made and adopted.

The Stabilization policy "Peace with Legality" establishes concrete actions in the territories with a long-term vision and its implementation will be carried out respecting and recognizing inclusive policies, with broad emphasis on those oriented to rural women. This action includes a gender mapping of the chain, as well as any gender gaps in access to productive assets, financing, road and productive infrastructure and other means considered relevant.

The PDET program's inclusive nature is highlighted, as evidenced by the proposed gender mainstreaming approach, aimed at empowering women in the production chain. The adequate recognition and implementation of inclusive practices seeks to benefit not only the women who are part of the project, the control of the processes and the benefits generated, but also the participating cattle-raising families in general. PDET is conceived as an integral, effective, sustainable and complementary intervention to the European Fund for Peace in Colombia, which seeks to facilitate the targeting of resources and the concentration, coordination and aggregation of actions to strengthen the productivity and competitiveness of the dairy chain in the regions, capitalizing and making visible in these processes the contribution of women as important agents in the different links (producers, processors, marketers, consumers) in order to develop efficient value chains with an impact on poverty reduction.

⁴ "Informe Especial del Instituto Kroc y el acompañamiento internacional, ONU Mujeres, FIDM y Suecia, al seguimiento del enfoque

de género en la implementación del Acuerdo Final". Informe especial diciembre 2016-junio 2018

CGIAR Research Programs (CRP) in [Livestock](#) and in climate change, agriculture and food security ([CCAFS](#)) have enabled the identification of appropriate mitigation measures for the livestock sector in tropical countries. This experience has generated critical information and guidelines needed to identify options, support planning and policies for scaling up Nationally Appropriate Mitigation Actions (NAMAs) through a briefing note ([NINO](#)), and assisting in the national process of meeting nationally determined contributions ([NDC](#)) of the Paris Agreement.

These [experiences](#) have strengthened the technical criteria of the team; to date, scientific evidence has been generated on cost-effective mitigation technologies, the generation of GHG emission factors from cattle ranching, the use and the [validation](#) of simulation models. All these inputs have generated the enabling conditions to be eligible, under a technical, political and financial suitability for the allocation of these funds from the European Union through the European Fund for Peace.

PDET Team, Office and operativity

The team is composed of a core of 8 professionals with diverse profiles that enable the development of livestock models that promote increased resilience of systems by increasing sustainable livestock productivity, as well as carbon sequestration and mitigation of the effects of climate change. Its central office is in the municipality of Florencia, from where the actions are planned, receiving logistical support from CIAT's office in Palmira. The pilot nursery is located in the municipality of El Doncello, Caquetá.

Main partners

ONF Andina, Red ADELCO, ICCO, CIPAV, Universidad de la Amazonia, Comité Departamental de Ganaderos del Caquetá, Juntas de acción comunal.

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