Approved Project Preparation Funding Application

Application Title	Low-Emission and Climate Resilient Agriculture in Colombia
Country/ Region	Colombia
Accredited Entity	CAF - Banco de Desarrollo de América Latina (CAF – Development Bank of Latin America)
Approval Date	16 April 2019

GREEN CLIMATE FUND

Notes

- The PPF supports the development of projects and programmes and enhance their quality at entry into the Fund's pipeline. With a view to enhancing the balance and diversity of the project pipeline, the PPF is designed to especially support Direct Access Entities for projects in the micro-to-small size category. International Accredited Entities seeking project preparation support from the PPF are encouraged to do so especially for LDCs, SIDS and African countries where no Direct Access Entity is accredited. All Accredited Entities are encouraged to articulate counterpart support for project preparation within their requests for support from the PPF.
- A PPF submission should include below documents:
  1. PPF request (this form)
  2. PPF No-Objection letter[1]
  3. Concept Note
- Please copy the National Designated Authority (ies) when submitting this PPF request.
- Requests for support from the PPF should be submitted at the same time or following submission of a GCF Concept Note for a project or programme.
- Further information on GCF PPF can be found on GCF website Project Preparation Facility Guidelines.

[1] Please note that the PPF No-Objection Letter is different from the Funding Proposal No-Objection Letter. PPF No-Objection Letter template can be downloaded from here.

A. Executive Summary			
Accredited Entity (AE)	Name: Mateo Salomon Position: Principal Executive Email: jsalomon@caf.com / esalinas@caf.com Tel: + 507.297.5397 / +55 (61) 2191.8624 Full Office address: Boulevard Pacífica P.H. Oceanía Business Plaza Torre 2000 piso 27, Panama City, Panama / SAF/Sul Quadra 2 Lote 4 Bloco D. Edificio VÃ-a Esplanada Sala 404 - CEP 70070-600 Brasilia DF		
Has a Concept Note[2] been submitted in association with this request for support from the PPF?	Yes ☒ No ☐ If yes, please indicate Project/Programme title: *Low-Emission and Climate Resilient Agriculture in Colombia*	**Has a No-Objection Letter[3] been submitted for this request for support from the PPF?**	Yes ☒ No ☐ *(Please note that a PPF No-Objection Letter is a requirement for the submission of this request)*
Total Cost	Total cost of Project Preparation activities : USD $ 710.000 Amount requested from the PPF : USD $ 642.600 Counterpart funding from CIAT: USD $ 100,000 (in kind co-financing for travel and staff cost for the implementation of the PPF) Counterpart funding from CAF: USD $ 50.000 (co-financing for the implementation of the PPF)		
Anticipated Duration	Number of months to implement the Project Preparation activities: 15 months		
Summary of the request for Project Preparation support	This PPF will complement CIAT resources, to take the Low-Emission and Climate Resilient Agriculture in Colombia Project to the implementation stage. CIAT resources will be used to identify specific technologies and interventions to apply to the selected crops, identify the geographical locations to apply the technology, considering conditions such as drainage, soil quality, evapotranspiration conditions, precipitation and temperature, altitude, and land use potential. PPF resources will be allocated to assess the potential impact of intended technologies, on avoided losses, increased yields, and potential income generation and resilience. Feasibility studies will help design knowledge management and a communications campaign, so that investments take place as public support is gained. PPF resources will help complement CIAT information to prepare a full fledge funding proposal for GCF in compliance with the fund´s investment framework criteria. Complementary to the PPF resources, CIAT will provide resources to help complement feasibility studies. CIAT´s role in planning and in coordinating with the Government and producer associations will be important to ensure GCF funds are rightly focused to the priority activities, in alignment with the sectorial agenda. The Ministry of Agriculture is a key partner in this Project, and will be involved actively through Project design. Other national agencies, including the National Planning Department (DNP) and Ministry of Environment will be included in presentations of the specific studies and the emerging project design.		

B. Description of Project Preparation Activities	
Outputs and Activities	Month *(Please shade the implementation period from the starting month of the Output and Activity in the schedule. Please also indicate the month of completion of each deliverable with "X" in the corresponding cell)*

[2] See here to download the Concept Note template.
[3] Template for PPF No-Objection Letter can be downloaded here.

(Please select Activity Areas[4], activities, and deliverables as needed)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Procurement and contracting Preparation phase to prepare and sign the contract between CAF and CIAT			X																					
Activity and deliverable 1: PPF activity area: Pre-feasibility, feasibility studies and project design ***1.1 Identification of sites and potential producer communities for adopting LECRA practices*** *Objective: Coordinate with producer associations, CIAT and farmers the selection of specific farmers to participate in the project with the adoption of the following technologies: Use of agro-climatic forecasting systems; Low carbon technological options; Site specific agriculture. This activity includes a series of workshops with the producer associations, backed by the Ministry of Agriculture, using existing information regarding impact, vulnerability and existing risks, and assessing specific technology costs and required conditions. Information from Activity 1.2. Impact Assessment will be also used to strengthen the dissemination of the project, as actual benefits from yield increase and cost reduction levels from former experiences will be presented to potential participants.* *Deliverables: Study including: the Identification and registration of potential farmers that will participate in the Project; Identification of sensors and equipment; Identification of average incremental costs per technology per farmer; System for selecting interested farmers, and contractual arrangements; Plan for implementing detailed interventions at farmer level.* ***1.2 Impact assessment*** *Objective: Assess the impact of LECRA pilot experience, and establish the effects of LECRA on avoided losses, increased yields and income, and expansion to beneficiaries over time, so that potential benefits can be extrapolated to the project´s planned interventions. This will include identification of changes in yields, quality of produce, avoided losses, income generation, food security, and resulting adaptation and resilience capacity for farmers, comparing baseline and outcome scenarios.* *Deliverables: Report including the assessment of the impacts of LECRA pilot experiences, and find its effects on avoided losses, increased yields and income, and expansion to beneficiaries over time.* ***1.3 MRV and carbon footprint*** *Objective: Identify and assess the impact on GHG emissions as a result of the adoption of low carbon*											X													

[4] The PPF can provide support within the following project preparation activity areas:
i. Pre-feasibility and feasibility studies
ii. Environmental, social and gender studies
iii. Risk Assessments
iv. Identification of programme and project level indicators

Other activities of direct relevance for Direct Access Entities that the PPF can support are as follows:
v. Pre-contract services, including the revision of tender documents
vi. Advisory services and/or other services to financially structure a proposed activity
vii. Other project preparation activities, where necessary, and with sufficient justification

technologies in the agriculture sector. This study will include the estimation of GHG reduction potential as a result of the adoption of low carbon technologies; and the establishment of a protocol for Monitoring, Registering, and Verifying the reduction of GHG emissions as a result of Project activities and technologies. *Deliverables: Study including ex-ante GHG emission reduction potential and MRV mechanism for the Project.* ***1.4 Technical coordination and drafting of GCF Funding proposal*** *Objective: Coordinate and draft the GCF Funding Proposal, including all the outputs from the technical studies prepared during the PPF phase.* *Deliverable: GCF Funding Proposal.*																							
Activity and deliverable 2: PPF activity area: Environmental, social and gender studiesEnvironmental, social and gender studiesEnvironmental, social and gender studies ***2.1 Social, Environmental, and Gender assessment*** *Objective: assess potential environmental and social impacts of the project´s intended interventions, and build a framework for avoiding, preventing or mitigating social and environmental risks. The assessment will also include a gender assessment, especially for the crops identified, and provide recommendations to promote a proper gender management during the project implementation. The management measures will take into consideration Colombia's, CAF and GCF´s environmental and social management regulations and requirements. Also, the assessment will build on the studies about challenges and priorities for gender related work in the agriculture sector in Colombia, carried out by CIAT. And the approach will follow CIAT´s social inclusive orientation to agriculture and climate agricultural adaptation and development* *Deliverables: Environmental and Social Assessment of the Project; Environmental and Social Management Framework of the Project; Report of the stakeholder engagement on the Project.*								X															
Activity and deliverable 3: PPF activity area: Advisory services and/or other services to financially structure a proposed activity Advisory services and/or other services to financially structure a proposed activity Advisory services and/or other services to financially structure a proposed activity ***3.1 Financial and economic assessment and structuring*** *Objective: Assess market opportunities, projected costs and financial returns, establish co-financing conditions, and perform economic and financial assessment; structure specific project investments, including the use of GCF grants and concessional loans, co-financing by CAF and private investments; and build a financial model for all specific project activities, and for the overall project.* *Deliverables: Study on economic and financial structuring of the Project and economic and financial model.*								X															

Estimated time for submission corresponding full Funding Proposal to the GCF														X								

C. Justification of the Project Preparation Request

PPF resources will be deployed to complement CIAT (the executing entity of the Project) resources, and help get the different activities and strategies presented in the GCF´s Concept Note to implementation stage. CIAT resources will be used to identify specific technologies and interventions to apply to the selected crops, identify the geographical locations to apply the technology, considering conditions such as drainage, soil quality, evapotranspiration conditions, precipitation and temperature, altitude, and land use potential.

PPF resources will be allocated to assess the potential impact of intended technologies, on avoided losses, increased yields, and potential income generation and resilience. Feasibility studies will help design knowledge management and a communications campaign, so that investments take place as public support is gained. In general, CIAT resources have long been used for long term research to contribute to the overall global purpose of securing food and agriculture production for the world´s tropical population. However, CIAT resources are seldom used to track down downstream impacts from adopting technologies at the widespread farm level, less even relating to the related enhanced capacity for adaptation and resiliency to climate change; or to estimating GHG emission reductions. PPF resources will help complement CIAT information to prepare a full fledge funding proposal for GCF in full compliance with the fund´s investment framework criteria.

Complementary to the PPF resources, CIAT will provide resources to help complement feasibility studies. CIAT´s role in planning and in coordinating with the Government and producer associations will be important to ensure GCF funds are rightly focused to the priority activities, in alignment with the sectorial agenda.

D. Implementation Arrangement

CAF has entered into a Framework Agreement with the GCF, therefore this PPF will be managed at portfolio level by CAF, in accordance to the “Framework Readiness and Preparatory Support Grant Agreement.

Considering, the specific role and expertise of CIAT for this project, CAF will proceed in a single sourcing of CIAT (direct contracting) which is consider in CAF´s procurement manual (NM 038, section VIII.19) for cases when there is limited alternative of similar providers with this level of expertise and knowledge; as well as when the provider allows continuity with the same project. The manual NM 038, section VIII.19 indicates:

> *VIII.19 DIRECT AWARDING*
>
> *The selection and hiring of a Supplier or Consultant may be directly, independently of the amounts established in Table No. 01, provided if meets any of the following characteristics and has the documentation duly justified and approved by the Vice President or Director of the respective area, according to the limits established in the Resolution of Authorized Signatures.*
>
> *VIII.19.1 The Supplier or Consultant of the good / service required is exclusive or that due to its level of specialization or knowledge (technical specifications) it is difficult to evaluate alternatives, in that case a support will be required.*
>
> *VIII.19.2 If the technical or specific conditions of the good, service or work exclude any possibility of competition, in that case a support will be required*
>
> *VIII.19.3 The selection of the Supplier or Consultant corresponds to the continuity of the same project, therefore its knowledge, quality of the service and its expert opinion contribute ro the optimization of the economic resources and, the start of a new selection process could be detrimental to CAF. This must be supported by the optimal evaluation of its last hiring.*

In addition, following the CAF´s procedures, the PPF was presented to the internal Special Committee of Funds on December 12, 2018 including the consideration of the direct contract to CIAT. This Committee is the CAF´s approving body for the execution of Technical Cooperation (with its own and external resources) including PPF as Delivery Partner. The committee approved the PPF and the direct contracting of CIAT.

It is important to note that CIAT is an International Organization with focus on Tropical Agriculture with the specific expertise required for this Project. CIAT has been working for more than 50 years in collaboration with hundreds of

partners to help developing countries make farming more competitive, profitable, and resilient through smarter, more sustainable natural resource management.

The International Center for Tropical Agriculture (CIAT) is an international non-for-profit research organization, linked and supported by the Consultative Group on International Agricultural Research (CGIAR), and based in Palmira (Colombia) as established in the International agreement held between the Government of Colombia and CIAT on May 5, 1987, which was approved through the Law 29 of 1988. CIAT's mission Increase prosperity and improve human nutrition in the tropics through research-based solutions in agriculture and the environment. For over 50 years CIAT has worked in Colombia to help low-income producers with the supply of agricultural technology (such as management practices, varieties and better policies). The Center works throughout the tropics, but with a special focus in Latin America, and with the aim of developing adaptive and multi-dimensional technologies.

CIAT currently leads the research program on Climate Change, Agriculture and Food Security (CCAFS), which is a strategic partnership that arises from the collaboration between the CGIAR and the Earth System Science Partnership (ESSP) and will be valid for 10 years. The initiative brings together strategic research in agricultural science, research for development, climate science and the terrestrial system, in order to identify and address the most important interactions and synergies between climate change, agriculture and food security. This cooperation seeks to integrate the knowledge and needs of farmers, policy makers, donors and other stakeholders into the tools and approaches developed. As a collective effort coordinated by CIAT, CCAFS will facilitate actions through various CGIAR centers and other research programs. In this program, CIAT administers around US $ 19.8 million annually.

As a member of the CGIAR, CIAT has global responsibility for the improvement of beans, cassava, forage for livestock and other tropical crops. CIAT, in collaboration with hundreds of partners, is dedicated to research and generate technologies, innovative methods and new knowledge that allow farmers, mainly those with limited resources, to improve their crop production systems, increase their income and manage sustainable way natural resources. Since its creation, over 50 years ago, the Center has been carrying out research programs and projects in the agricultural sector in Colombia, in order to support the social and economic development of the regions, conducting research that has contributed to the increase in production and the productivity of basic crops, through own actions and cooperation with national programs and institutions aimed at the generation and transfer of technology.

Moreover, CIAT is a key execution partner of the MADR. In particular, between 2013 and 2015, CIAT has been the technical partner and executor of a pilot of climate resilient agriculture for corn and rice, the two crops more vulnerable to climate change in the country. This pilot project is the basis on which this CAF-GCF project has been conceptualized.

As such the involvement of CIAT is key in this project and it previewed that CIAT will act as the executing entity for the beneficiary during the implementation of the Project.

CAF, as the Accredited Entity, with the MADR, the beneficiary, will be responsible to provide technical oversight of the studies to be prepared and ensure the alignments with objective of the Funding Proposal to be develop for GCF and CAF funding. As such CAF will also complete the due diligence process of the Funding Proposal.

For better coordination and ownership, CAF will establish a coordination mechanism for the implementation of the PPF including a representative from CIAT and from the MADR. In addition, close coordination and engagement from the producer associations of the crops prioritized for the project will take place during the implementation of the PPF and the preparation of the Funding Proposal.

E. Budget[5] Details and Disbursement Schedule		

Detailed budget was removed due to confidential information

[5] "Sub-total cost" must be provided for each activity, and broken down by the "cost categories" (e.g. Consultants, Travel, Equipment, Training & workshops, Others). Please provide sufficient breakdown of costs to enable effective review.

GREEN CLIMATE FUND

Concept Note

The Green Climate Fund (GCF) is seeking high-quality projects or programmes.

The Accredited Entity is encouraged to submit a concept note, in consultation with the National Designated Authority, to present a project or programme idea and receive early feedback and recommendation.

Project/Programme Title:	Low-Emission and Climate Resilient Agriculture in Colombia
Country(ies):	Colombia
National Designated Authority(ies) (NDA):	Departamento Nacional de Planeación
Accredited Entity(ies) (AE):	Corporación Andina de Fomento (CAF)
Date of first submission/ version number:	2018-01-06 V.1.0
Date of current submission/ version number	2018-09-10 V.1.2

Notes
• The maximum number of pages should **not exceed 12 pages**, excluding annexes. Proposals exceeding the prescribed length will not be assessed within the indicative service standard time of 30 days. • As per the Information Disclosure Policy, the concept note, and additional documents provided to the Secretariat can be disclosed unless marked by the Accredited Entity(ies) (or NDAs) as confidential. • The relevant National Designated Authority(ies) will be informed by the Secretariat of the concept note upon receipt. • NDA can also submit the concept note directly with or without an identified accredited entity at this stage. In this case, they can leave blank the section related to the accredited entity. The Secretariat will inform the accredited entity(ies) nominated by the NDA, if any. • Accredited Entities and/or NDAs are encouraged to submit a Concept Note before making a request for project preparation support from the Project Preparation Facility (PPF). • Further information on GCF concept note preparation can be found on GCF website Funding Projects Fine Print.

A. Project / Programme Information (max. 1 page)			
A.1. Project or programme	☒ Project ☐ Programme	**A.2. Public or private sector**	☒ Public sector ☐ Private sector
A.3. Is the CN submitted in response to an RFP?	Yes ☐ No ☒ If yes, specify the RFP: _____	**A.4. Confidentiality[1]**	☐ Confidential ☒ Not confidential
A.5. Indicate the result areas for the project/programme	Mitigation: Reduced emissions from: ☐ Energy access and power generation ☐ Low emission transport ☐ Buildings, cities and industries and appliances ☒ Forestry and land use Adaptation: Increased resilience of: ☒ Most vulnerable people and communities ☒ Health and well-being, and food and water security ☐ Infrastructure and built environment ☐ Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO2eq over lifespan)	TBD at PPF stage[2]	**A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)**	TBD at PPF Stage[3]
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD 83,008,025	**A.9. Indicative GCF funding requested**	Amount: USD 47,000,000
A.10. Mark the type of financial instrument requested for the GCF funding	☒ Grant ☐ Reimbursable grant ☐ Guarantees ☐ Equity ☐ Subordinated loan ☒ Senior Loan ☐ Other: specify_____		
A.11. Estimated duration of project/ programme:	a) disbursement period: 5 years b) repayment period: 20 years	**A.12. Estimated project/ Programme lifespan**	NA
A.13. Is funding from the Project Preparation Facility requested?[4]	Yes ☒ No ☐ Other support received ☒ If so, by who: CIAT	**A.14. ESS category[5]**	☐ A or I-1 ☒ B or I-2 ☐ C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes ☒ No ☐	**A.16. Has the CN been shared with the NDA?**	Yes ☒ No ☐
A.17. AMA signed (if submitted by AE)	Yes ☒ No ☐ If no, specify the status of AMA negotiations and expected date of signing:	**A.18. Is the CN included in the Entity Work Programme?**	Yes ☒ No ☐
A.19. Project/Programme rationale, objectives and approach of	The project will enable the adoption of Low-Emission Climate Resilient Agriculture (LECRA) in Colombia, through the strengthening of agriculture and livestock producer associations in seven prioritized crops: rice, maize, banana, sugarcane, coffee, potato,		

[1] Concept notes (or sections of) not marked as confidential may be published in accordance with the Information Disclosure Policy (Decision B.12/35) and the Review of the Initial Proposal Approval Process (Decision B.17/18).
[2] Agriculture and livestock raising in Colombia represents over 50% of total GHG emissions. The feasibility studies will help determine the project´s potential emission reductions.
[3] Likewise, it is expected that agro-livestock losses due to extreme climate events are reduced; the feasibility studies will estimate the impact of pilot experiences in Colombia, so that an impact in term of loss reductions can be estimated.
[4] See here for access to project preparation support request template and guidelines
[5] Refer to the Fund's environmental and social safeguards (Decision B.07/02)

programme/project (max 100 words)	and forage, and research institutions for mitigating and adapting to climate change. The project will help avoid economic losses resulting from climate change effects on agriculture and livestock production, increasing resilience to extreme weather and climate impacts. Also, through the promotion of site specific agriculture, producers will be able to increase yields reducing the potential for expanding the agriculture frontier, and thus contributing to climate change mitigation.

B. Project / Programme details (max. 8 pages)

B.1. Context and Baseline (max. 2 pages)

Latin American countries are highly vulnerable to climate events due to their heavy dependence on the agro-livestock sector. In Colombia, losses in this sector represented about USD 480 million due to El Niño in 1997-1998 (CEPAL, 1999); and USD 1000 million due to La Niña event in 2010-11 (BID y CEPAL, 2012), resulting from changes in the frequency and intensity of droughts, floods, rains, and storms; and from more frequent and drastic temperature and precipitation pattern changes generated by cyclical events like El Niño and La Niña.

Colombia in particular is ravaged by climate variability, and highly vulnerable to future climate change, due to its geographical conditions, that include populated low lands with high flooding risks, mountainous regions hosting most of the population, and subject to erosion, landslide risks, water shortage and higher than average warming due to climate change. Colombia's energy is primarily generated by hydropower facilities, and is heavily exposed to changes in precipitation. Also, the supply of food and staples gets regularly affected by climate related events, not only reducing productivity, but also interrupting or delaying mobilization of goods and services due to the damage of infrastructure resulting in price spikes for poor urban consumers. Colombia is the second most biodiverse country in the world, and these and other natural resources are also documented to be heavily vulnerable to climate change.

According to the Third National Communication to the UNFCCC, produced by Colombia´s Environmental Information Institute (IDEAM), agriculture is one of the sectors most affected by climate change, as changes in temperature and precipitation will affect yields, land suitability, and shift harvest seasons (IDEAM, 2017). Farmers have only limited access to climate adapted practices and technologies, and are vulnerable to high crop losses due to climate variability. Climate phenomena such as La Niña or El Niño have recently become more severe, and losses have been dire not only for local producers but for the entire country. La Niña in 2010-2011 heavily impacted the country, affecting crops, infrastructure and livelihoods. Extreme weather events such as severe rainfalls affected 3.2 million people and the floods affected 3.5 million hectares (BID y CEPAL, 2012) and losses due to this climatic event sum up to 6.052 million USD from which 7% corresponds to the agricultural sector (BID y CEPAL, 2012).

According to IDEAM (Ruiz, 2010), temperature in Colombia increased by 0.13 °C per decade for the 1971-2000 period; and it is expected to rise 3-5 °C by the middle of the 21st century (Arnell et al, 2004; IPCC, 2007). Climate change is expected to have an important effect in the agriculture sector in Colombia. Yield decrease is one of the main risks faced by Colombia; according to IDEAM et al. (2017,) 26 out of 32 Colombian departments present a level of risk High and Very High. These risks are projected to affect more than proportionally food safety staples like cassava, rice, plantain, sugarcane, potato, maize, and beans. This is due to the high sensitivity of these crops to changes in precipitation and temperature, and also to the current state of vulnerability in the agriculture sector, as there is lack of insurance coverage, mal-adapted technological packages, and due to deficient infrastructure, amongst other factors.

Amongst the most relevant impacts on agriculture generated by climate change in Colombia include:

- Losses in livestock sector both in number of animals, and productivity
- Losses in crop yields
- Reduced crop resilience
- Decrease in water availability
- Increase in land erosion
- Decrease in top soil moisture
- Increase of pests and diseases incidence
- Increased occurrence of unexpected fires
- Reduction of number of crop cycles
- Decrease of food and nutritional security

For livestock, a significant contributor to the agricultural GDP, a study by the National Planning Department (DNP, 2014), on the economic impacts of climate change in Colombia, shows that the departments experiencing higher impacts in cattle production are Nariño (18.5%), Casanare (6.0%), Córdoba (5.4%), Caquetá (4.6%), Guaviare (3.6%) and Cundinamarca (3.5%). Many of these departments are characterized by high rural poverty levels, and smallholder systems. Another study by FAO and the Ministry of Agriculture (FAO -MADR, 2013 abc) predicts yield losses in the main maize producing regions of Colombia: wet Caribbean (25%); Orinoquia (20%); Upper Cauca River Basin (11%), and Upper Magdalena (62%); similarly, yield losses of about 25% are to be expected in rice production in Orinoquia, while potato yield losses of about 10% are to be experienced in Cundinamarca-Boyaca; and of about 40% in Nariño. Lau et al (2010) estimate high vulnerability for sugarcane production to changes over 2°C in temperature, and over 3% in precipitation. Also significant changes in phenological traits, flooding trends, and potential increases in pests and diseases in the export banana production.

To address these multi-faceted challenges in the agricultural sector, a Low-Emission and Climate Resilient Agriculture in Colombia - LECRA approach is needed. CSA is defined as agriculture that (a) sustainably increases agricultural productivity and incomes, (b) adapts and builds resilience to climate change, and (c) reduces and/or removes GHG emissions where possible (FAO 2013). The origin of the concept is in the realization that many proposed actions in agriculture deliver on both adaptation and mitigation, signaling a move away from the clear distinction between adaptation and mitigation streams within the UNFCCC negotiations. CSA is closely aligned with sustainable intensification at the farm level (Campbell et al. 2014) and also includes agro-ecological approaches (Sugden 2015). But the concept extends beyond on-farm practices to include landscape-level interventions (e.g. management of farm-forest boundaries), services (particularly information and finance), institutions (particularly market governance, incentives for adoption) and the food system (particularly consumption patterns and wider climate-informed safety nets). CSA may also be understood as a process that comprises parallel elements of institution-building (Lipper et al. 2014). For Colombia in particular, the Ministry of Agriculture and Rural Development (MADR) have focused their CSA efforts around new agricultural technological development, agro-climatic forecasting and related advisory services, site specific / precision agriculture approaches, and low carbon agricultural practices.

The International Centre for Tropical Agriculture (CIAT) has worked hand in hand with MADR to pilot such approaches over the past 5 years. An Agreement was signed between MADR and CIAT in 2013 to pilot LECRA initiatives with the major producer associations of Colombia. The work has confirmed that depending on the date of planting, the same variety of rice or maize, on the same plot, can have vastly different productivity levels and that seasonal forecasts can inform farmers to make the best choices as to what to plant and when to plant. This type of approach has enabled producers to avoid important losses by synchronizing their planting time to the agro-climate forecast provided by CIAT, in coordination with IDEAM (Colombia's National Environmental Authority). In 2014, CIAT helped 170 rice farmers avoid over USD $3 million in losses, as a result of planting on the recommended date, which was different than the traditional planting time (FEDEARROZ, 2015). Although promising, the technology is still far from been widely applied, as there is need to determine local climate trends and associate them with soil characteristics and farmer culture.

Site specific agriculture has also been demonstrated to deliver climate adaptation, avoiding crop losses and enhancing productivity. It consists of understanding the unique climate, soils and management conditions for each farm, and providing farmers with tailored agro-advisories to manage their crop most effectively for productivity and adaptation outcomes. CIAT has identified the limiting production factors for various crops, and used these to suggest alternative practices to better manage the varying climate conditions. Together with seasonal forecasts, this approach is a powerful means of ensuring dynamic, responsive adaptation to emerging climate threats.

However, it requires that a good amount of information gets properly used and applied and is therefore a strategy that requires both institutional adaptation, and gradual adoption with farmers as the information progressively improves and the robustness of advice increases. This strategic approach can have economic benefits in avoiding unnecessary fertilizer applications and thus have positive effects on mitigation. It is very common for Colombian farmers to use standard fertilization dosage practices, which in most cases may lead to under or over fertilized crops. In other cases, if the harvest yield can be forecast, arranging for a larger number of collectors may be the difference between a good or bad harvest and its effect on quality and produce prices.

Low carbon agriculture is related to site specific and agr-climatic agriculture, as higher yields per hectare may help deter the expansion of the agriculture frontier, while saving costs related to increased transport and additional labor when crop areas expand with maintained low yields. In addition, there are decisions and practice that favor emission reductions, such as low tillage, a reduced use of nitrogen-based chemicals, or of agrochemicals used for pest control. Using the right

amount of water or nitrogen can result from better knowing local conditions, and the type of varieties planted and their reactions to site soil and climate conditions.

CIAT and partners are also working on genetic varieties that are more resilient to climate variability and climate related pests. Specifically, it has recently launched 10 lines of more resistant maize varieties, and 2 lines of beans resistant to drought. A good selection of varieties on the side of farmers will reduce risks and in many cases optimize productivity per hectare.

Assessing the real need for water in crop growth processes is one of the areas that CIAT has also worked with, as part of a Climate Smart Agriculture pilot with MADR. It has determined that the amount of water per kg of corn is 1200 liters, as opposed to the world standard of 2500 lt./kg. Similarly, in rice, it was possible to reduce the use of irrigation water in 42%, passing from the traditional 15635 m3/ha/cycle to 9069 m3/ha/cycle. This is a saving of 395 liters of water per kg of rice, and becomes a key adaptation option given future predictions of water scarcity.

Tracking the carbon footprint in agriculture production is also one of the areas where CIAT has been working, to determine carbon per ton of avocado fruit, or per oil palm fruit cluster, or liter of oil palm.

The collaborative work between MADR and CIAT has demonstrated these approaches as viable climate change adaptation and mitigation approaches, and demonstrates the success stories related to the use of tools proposed in this project proposal. Adequate planning, (based on effective 6-month climate forecasts), the use of adequate number of crop varieties and cultivars, and site-specific agriculture, have allowed to avoid over USD100 million in losses associated with production of rice, maize and beans. The following table demonstrates the state-of-art for these approaches in the different crops.

Crop	Technological Approach			
	Generation and use of agro-climatic forecasting	**Productive gap filling through Site Specific Agriculture**	**Water footprint assessment**	**New low carbon and resiliency oriented technological options**
Rice	Already has agr-climatic forecasting capacity in main production zones. Also it has institutional capacity to continue with the program	There is capacity, information, and tools. However, its scaling strategy has been moderate.	There is information and low water consuming technologies have been identified for the main producing regions.	There is no progress in this regard.
Maize	Already has agr-climatic forecasting capacity in main 3 production zones. Also it has institutional capacity to continue with the program	There is capacity, information, and tools. However, its scaling strategy has been moderate.	There is information and low water consuming technologies have been identified for the main producing regions.	There are estimations and low carbon technologies identified for the main 3 producing regions.
Sugarcane	Producer association has agr-climatic forecasting capacity. However it does not have the crop growth modeling to relate to the climatic forecasts	There is capacity, information, and tools. Also, a very ambitious scalating strategy	There are some low water technologies and information, but need to develop scalating strategy	There is no progress in this regard.
Sugarcane for rough sugar	Very low capacity. There is no progress in this regard.	Very low capacity, no information and no progress	There is no progress in this regard.	There is no progress in this regard.
Banana	Very low capacity. It only has some initial attempts but not enough capacity to develop the technology on their own.	Very low capacity, although some producers have some registries. There is no progress in this regard.	There is no progress in this regard.	There is no progress in this regard.
Coffee	Even though they have good agr-climatic information, there are no instruments of mechanisms to enable decisions at the farm level	Ithere is very good information but no progress.	There is no progress in this regard.	There is no progress in this regard.
Potato	Very low capacity. There is no progress in this regard.	Very low capacity and no information system. There is no progress in this regard.	Even though they have information and technologies, there is need to scale up	There are measurements and analysis and low carbon technologies have been identified for the 2 main producing regions.
Cattle	Very Low capacity. There is no progress in this regard.	Very low capacity although some producers have some registries. There is no progress in this regard.	There is information and analysis for 1 producer region	There are measurements and analysis, and low carbon technologies have been identified for 5 producing regions.

Many lessons have been learnt from this work over the past 5 years. One main barrier is the lack of capacity for processing the large amounts of data which these approaches rely on. However, the project has an activity for setting and developing big data processing tools, already used in the agri climatic forecasts for maize and rice, and in the precision agriculture program for maize and beans. The project will also work on the institutional human resource barrier, which in many cases requires the adoption of a good practice and the promotion of cultural change, so that the existing information at the producer associations can be used to promote change at the farmer level. The other implementation barriers include the asymmetry of information, lack of communications and knowledge management at the farmer level.

The LECRA Project will build on this experience and out-scale the activities to key producing sectors and regions in Colombia (rice, maize, banana, sugarcane, coffee, potato, and forage), through work with the producer associations´ technical extension mechanisms. The work proposed is aligned to the priorities for the agriculture sector in Colombia's NDC, and also consistent with Colombia's national adaptation strategies.

B.2. Project / Programme description (max. 3 pages)

The Project *Low-Emission Climate Resilient Agriculture (LECRA) in Colombia* will invest in eight (8) key areas to strengthen the agro-livestock sector's capacity to mitigate and adapt to climate change and to increase efficiency in the use of production resource systems in prioritised regions. The areas of investment are:

1. **Generation and use of agro-climatic forecasting** as an adaptive alternative for the Colombian agricultural sector to climate variability. It will help in crop planning and livestock maintenance. This information will be used to predict crop yields under different scenarios, planting periods, use of proper varieties, planting spacing, and crop handling. In the project, this information will be delivered by agricultural technicians in a systematic manner to an important number of participating farmers in order to generate the most appropriate environmental recommendations for upcoming semesters. It will be applied to the following seven prioritized crops: rice, maize, banana, sugarcane, coffee, potato, and forage. These crops have been selected as they represent the largest impact in terms of families involved, and in terms of vulnerability to climate change.

2. **Productive gap filling through Site Specific Agriculture**. Identification of the site specific limiting factors of intensive agricultural production, so that producers can focus on key climate and operating variables. It intends to increase the competitiveness of each producer through gaps filling in the current use of farming technologies and practice, according to specific site conditions. This component requires input from soils research which is essential to define a better way of technological adaptations for each producer in a climate change context. It will be applied to the seven prioritized crops: rice, maize, banana, sugarcane, coffee, potato, and forage, and implemented at farmer level, in coordination with the producer associations.

3. **New low carbon and resiliency oriented technological options** (including genetic resources) for sustainable production. The identification and adoption of low carbon technologies to reduce GHG emissions will be promoted; and genetic material more tolerant or resistant to climatic events will be developed with the goal of providing appropriate technology for new climatic conditions. The component will be applied to the seven prioritized crops: rice, maize, banana, sugarcane, coffee, potato, and forage, and implemented at the farmer level so that an important number of producers get to adopt the technologies.

4. **Impact assessment**. Impact of project activities, with relation to income generation, avoided losses, increased yields, and the effect on enhanced adaptation capacity and resiliency to climate change, related to selected crops. This will allow to estimate the project impact and will be a key component to track effectiveness, and provide prompt feedback. Implementation of this component with the participating farmers is important to ensure that specific conditions at the farm level are tested so that replication and scale up can be facilitated.

5. **MRV and carbon footprint.** This component is oriented to estimate, report and verify the emission reduction of low carbon technologies to be deployed by the project. It will take the experiences at the farmers´ level and determine carbon emission reduction potential for the different technologies at the different project locations.

6. **Water footprint assessment**. This component will track down water usage and management, and will provide information about the crop and technology efficiency and the use of natural resources at the farmer level. The water

footprint will help assess dependence on hydric resources, and will help inform agriculture development planning processes about water savings. It will be applied to the following crops: banana, sugarcane, coffee, and forage[6].

7. **Germplasm Bank enhancement**. This component will focus on upgrading CIAT´s germplasm reservoir, to increase and enhance the capacity for collecting and preserving seeds of high value and climate resilient varieties, with the intention of retrieving, preserving and enhancing the gene diversity necessary for low carbon resilient agriculture, in three key crops: beans, cassava, and tropical forages. Once enhanced, the germplasm bank will be made available to end users. Anyone, including farmers, can request germplasm to be sent to them free of charge via a public website. This website lists the germplasm samples available, geographic provenience (and hence adaptation), and some traits of relevance. The germplasm bank will also be open to visitors, and CIAT will work with schools to promote awareness about the importance of safeguarding the world's crop diversity.

8. **Knowledge Management Capacity building** for associations and research centers to generate autonomy, including end-to-end engagement with all agricultural value chain participants in order to socialize LECRA practices and the role of LECRA for adaptation and mitigation.

Expected results from the project implementation include:

- Reduced economic losses to farmers as a result of phenomena like El Niño and La Niña and other extreme weather events. Reduce losses at least by 15% in the selected crops.
- Government savings generated due to the reduction in the losses of farmers (the need for government intervention is reduced through crop loss mitigation actions). It is a prevention commitment.
- Increased competitiveness of the agricultural sector, applying simple and easily implementable measures to promote productive gaps filling.
- Improved planning of the agricultural sector preventing that impacts from weather events affect the final price structure, creating climate-resilient value chains
- GHG emission reductions from adoption of LECRA technologies for agricultural production, as increased productivity will help mitigate the need for expanding the agricultural frontier
- Increased productivity due to the use of cleaner technologies, while reducing greenhouse gas emissions and contribute to reduction targets, promoting sustainable and green development.
- Support for three of the NDC priority regions for adaptation measures (ie, Caribbean, Andean, and Orinoquia regions), and for the strategic lines of work delineated by Colombian adaptation policies.
- Novel crop diversity for the development of improved crops, increasing resilience of food security - within Colombia and globally.

Knowledge Management

The project´s main strategy for scaling up and replicate the adoption of climate smart technologies relies on strong capacity building and knowledge activities, core functions of CIAT as a CGIAR institution. The strategy is focused to strengthening the participating producer associations, which have the role of promoting and spreading the technologies downstream to the farmers. Thus, first step will be to engage and train technical staff from producer associations will be one of the key project activities, to be specialized in the climate smart agriculture technologies, including local technical staff in the prioritized regions. Second step will be to engage farmers who will implement the technologies in their lands. Their engagement will start from their participation in selection, design and adoption of the right technologies, as well as in their monitoring and evaluation. As project participants, farmers will have to participate in the knowledge management and communication activities to help other farmers learn about the technologies being implemented. Third, technical service and equipment providers and other value chain participants will also be involved in the projects, and will be able to replicate with other farmers in the future. Fourth, technical staff from producer associations not participating in the project. Although not included in the first set of producer associations staff, and not trained by the project, this group will be able to learn through participation in daytrips, documentation, and all of the project´s knowledge management strategies. Fifth, farmers and producers from other associations and regions, will be also exposed as technologies get

[6] Water footrprint assessment for rice, maize and potato have already been done by CIAT in the framework of an agreement with the MADR.

disseminated, and as these other farmers start adopting technologies as well. Finally, the academy will be engaged in providing researchers the opportunity to participate in applied research programs, and in training for university staff.

Environmental and Social Management

The project will have an Environmental and Social Management Framework (ESMF), based on the assessment about potential benefits and risks of the project intended measures, which will be undertaken with PPF support. ESMF will set procedures for screening environmental and social potential impact and opportunities, and for addressing identified risks with management and control measures. This framework will place special attention to gender issues, under CIAT´s social inclusive approach, which also includes youth. CIAT have already performed a number of studies that set out the challenges and priorities for gender-related work in the agriculture sector in Colombia. One study has examined the priorities at national level for inclusion of gender in climate (CIAT, 2015) - and development- related public policy. Another study has gone into detail on sector specific state-of-art and priorities for livestock.

Similar stocktaking will be made during full proposal development, and key strategies incorporated into the program plan.

Implementation arrangements:

CAF – development bank of Latin America, will act as the Accredited Entity, for this Project. CAF promotes a model of sustainable development through credit operations, grants and support in the technical and financial structuring of projects in the public and private sectors in Latin America. In particular, CAF finance interventions aimed at closing gaps or solving faults that affect the efficiency and competitiveness of agro-industrial chains, promote networks with enterprises, public authorities, and applied research centres that boost the development of the agro-industrial sector in the LAC region. During 2016, CAF approved operations in Colombia for a total of USD 2.077 million, of which can be highlighted a USD40 million credit line to Banco Agrario, with the objective of supporting the promotion of agro-industrial projects and the development of the agriculture sector, the diversification of the production matrix and the generation of jobs in the rural areas. In November 2017, CAF approved a loan of USD400 million for budgetary support to Colombia for its Program to Support the Integrated Rural Development in the Context of the Post-conflict, which will contribute to implement public policies in strategic sectors, define regulations, strengthen the provision of rural public goods, impulse social development and enhance the productivity of the rural areas.

CIAT, the International Center for Tropical Agriculture, will be the executing entity of the Project. CIAT was founded in 1967, an international non-profit entity, with the aim to reduce hunger and poverty and improve human nutrition in the tropics through research focused at increasing the eco-efficiency agriculture. Part of the CGIAR Network, and headquartered in Colombia, CIAT has over 200 scientists supported by a wide range of donors. It is headquartered near Cali, Colombia, with regional offices in Nairobi, Kenya, and Hanoi, Vietnam. Center scientists work in Latin America and the Caribbean as well as 29 countries in sub-Saharan Africa, and 5 in Southeast Asia. CIAT works with more than 500 national and international partner organizations in developing and industrialized countries and also take the form of networks and consortia. As part of the CGIAR Consortium has the mission to lead the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) which has a global scope with regional emphasis in Latin America, West and East Africa and South and Southeast Asia. CCAFS support and promote the linkages between the research done by CGIAR centers and its partners with policy and decision makers from local to national and regional level and vice-versa, compiling evidence to make informed policies and decisions that contribute to increase resilience and diminish food insecurity. CCAFS approach relies on LECRA, Climate Services, Low Emissions Agricultural Development and policy and institutions for secure and resilient food systems.

The Ministry of Agriculture and Rural Development (MADR) will be the beneficiary of the Project. The MADR is the national entity in charge to develop, coordinate and evaluate the policies that promote the competitive development, equitable and sustainable development processes of the agricultural, forestry, fisheries and rural sector, with criteria for decentralization, consultation and participation, which contribute to improving the level and quality of life of the Colombian population.

The implementation of the Project will be done in close coordination with the selected crop producer associations and related research institutions, including:

- ASBAMA, and AUGURA, the Banana Producers Associations, and their research centre, CENIBANANO;
- ASOCAÑA, and FEDEPANELA, the Sugarcane Producers Associations, and their Research Centre, CENICAÑA;
- FEDECAFE, the Federation of Coffee Producers, and CENICAFE, its related research centre;
- FEDEPAPA, the Federation and Research Support Entity for the potato producers;
- FEDEARROZ, the Rice Producers Federation and Research Centre; and
- FENALCE, the Association of Legume and Cereal Producers
- FEDEGAN, the Cattle Ranching National Federation

The producer associations governance is based on a Governing Board, formed by delegates from producers from the main producing areas, elected democratically. The Governing Board then selects a General Manager, and appoints staff for the technical, administrative, legal, communications, and financial areas. The associations have offices in the main producing areas, where they count with technical and administrative staff. In the case of special projects, temporary staff is also appointed as requested. The producer associations represent private sector interests, as the associations are funded by members´ association fees. They involve representatives from the entire value chains.

The role of producer associations is two-fold. On one hand, they have a full understanding of the crops´s and farmer`s potential, restrictions, and common challenges. These associations also have helped in coordinating research and application of new technologies that can help increase yields, achieve better quality standards, access new markets, and obtain better prices. They have been instrumental in representing producers before the government´s executive and legislative bodies. So one key role they will play in the project is helping design the specific interventions for technology applications as part of the project implementation.

On the other hand, the producer associations will be instrumental in disseminating and promoting the adoption of the new technologies with the largest number of producers in the priority regions firstly, and later in the whole country.

The project will finance the participation of technical staff especially appointed for the project by the producer associations during implementation. In general, the project would finance 3 technical staff per component. Since these staff belong to the associations´ regular payroll, after their immersion in CSA during the project, they will continue in the future spreading and formulating new related initiatives, and supporting additional farmers with their own projects. This will be the key element for scaling up the project scope to a larger number of farmers and regions.

For each crop, an implementation program will be developed for each producing region, involving one or more technological component. Each program will be implemented at commercial scale, involving producing lots located in strategically located farms. Each component may have 3 or more technologies, and each technology is to be implemented at least in 3 farms. This approach will reduce the risk of information losses. The design and planning of activities will be done with the participation of farmers, and the technology application will be led by the Producer Association.

The monitoring, follow-up, and evaluation will be undertaken jointly by the producer associations and CIAT. The strategy for strengthening capability will be implemented by CIAT. The project team will be composed by CIAT staff, with 1 general coordinator, 1 technical assistant, and 1 logistics assistant. This team will coordinate and lead the project activities. In CIAT, in addition, there will be 1 Technical Team per component. The project team will be in charge of negotiating with the producer association, and will ensure that the project will be well implemented in all key aspects (ie, financial, legal, technical, administrative).

In addition, a coordination Committee will be formed to integrate the head sector institutions in Colombia (Ministry of Agriculture and Rural Development, Ministry of Environment and Sustainable Development, DNP (Sustainable Rural Development Area), CIAT, and allied institutions such as the producer associations, which will be the ones coordinating the adoption of specific pilot programs in the field. The Committee will be used to monitor and assess progress, and to provide feedback as required.

Key financial and operational risks:

Stakeholder risk: In general, the community of farmers and ranchers tend to be very conservative when it comes to adapting to new technologies, varieties, or crops, presenting a very important yet passive resistance for the introduction of profitable new procedures. This risk can be mitigated by establishing close relations with relevant stakeholders, including the Government and stakeholders at the end of the productive chain.

Technical Performance Risk: This risk is linked to potential wrong design or management of trials and pilot projects, or failure in partnership arrangements or institutional setups. The probability of this risks occurring is very low despite the

high level of impact they represent. To mitigate this risk CIAT will set a Project Coordination Team with capacity to travel for carrying out monitoring of progress and detect early mismanagement and non-compliance risks, and take measures in time.

Delay and cost override risk: There is an inherent risk of delay in the scheduled works planned, including the acquisition of inputs, human resources, materials and tools. This risk is probable to occur having a medium impact. In the event that there is a delay in the timing, a possible outcome is a cost increase. Contingencies must be included in the budget estimates of the project, as a mitigation measure of this risk. Another measure is a close budget and financial monitoring to avoid any possible delay or override. A CIAT coordinator will be in charge of operational issues to detect early risks and take action on time.

Sustainability risk: After the end of the project, adequate maintenance must be provided to the infrastructure to ensure a long-lasting lifespan. From the beginning of the project, each stakeholder will have clear responsibilities assigned during the period of execution as well as after the project ends, and will be taken over by the farmers themselves. The strengthening of the producer associations will help mitigate this risk as they will provide technical and economic support to their members.

Location risk: The project will undertake activities in remote areas difficult to access. CIAT will have the capacity to provide supervision in all implementation sites, with regular visits and reports. To mitigate the risk, location will be a criteria for selecting pilots, and the ones closer to logistic structure will be preferred.

Exchange Rate Risk: Financial planning may be affected by exchange fluctuations in the future. Hedging and good planning may help mitigate this risk.

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

Climate impact potential

The project will have a climate change mitigation and adaptation impact, both at a local and national level through the development of resilient and more efficient agriculture and livestock activities. All pilot achievements will be disseminated to the sectors through knowledge management development and transfer, based on the participation of the producer associations. The project will enhance livelihoods of the most vulnerable people, communities and regions across the countries.

Agriculture and livestock raising in Colombia represents over 50% of total GHG emissions. The feasibility studies will help determine the project´s potential emission reductions. Likewise, it is expected that agro-livestock losses due to extreme climate events are reduced; the feasibility studies will estimate the impact of pilot experiences in Colombia, so that an impact in term of loss reductions can be estimated. In Colombia this project will contribute to the country´s goal of achieving the 20% reduction commitment of national GHG emissions by 2030. According to the national climate change policies, in Colombia each sector will have to contribute its 20% share to the total country reductions.

Main benefits consistent with the GCF adaptation objectives are related to the avoided losses due to climate change in agriculture and livestock raising activities, which impacts are felt on prices, affecting larger groups of population, as a response to scarcity. The impact at the micro level is directly to producers, which losses can seriously affect their ability to generate income and food supply for their families.

As per mitigation, AFOLU is the largest source of emissions in Colombia, and land use change is perhaps one of the main drivers. Increasing productivity per hectare, and avoiding the need to expand the agriculture frontier in response to non-productive, flooded or eroded areas will contribute to climate change mitigation.

Paradigm shift potential

The project is transformational in the sense that it is systematically mainstreaming climate into decision making processes from national to farm level. This project will invest in the implementation of adaptation measures of the agriculture sector in prioritized crops and locations in Colombia which will further expand throughout the country, as the different sectors start replicating the project experience.

MADR and CIAT have already implemented a pilot project including rice, and cotton, in some regions of Colombia including Villavicencio, Yopal, Aguazul, Ibagué, Saldaña, Neiva, Aipe, Montería, Espinal, Ciénaga de Oro, Buga, Espinal, and Cereté. It is expected that the GCF project will enable escalating to other crops regions, and covering more products, based on the experience, lessons learned and similarities.

In order to scale-up and replicate initiatives (WRI, 2015) the Project will:

1. Identify existing success LECRA experiences (projects that under a LECRA similar financial and technical structure have been carried out in a satisfactory way);
2. Support peer-to-peer learning and the development of community based institutions;
3. Address policy and legal issues to enable conditions for the development of similar projects (analyse barriers and adapt more conducive policies, legislations and other development interventions);
4. Develop and implement a communication strategy (inform stakeholders and disseminate information about experiences, impacts and value chains);
5. Develop and strengthen agricultural value chains (by focusing on value chains farmers will be capable of capitalizing their role in the market, promoting the scale-up of LECRA projects);
6. Expand research activities (increase support for action research, may help filling gaps in knowledge needed to refine and improve the effectiveness of scaling strategies and benefits) and strengthening national and local capacities;
7. Promote structured decision-making and implementation using clear rationale and impact-based orientation.

Once risk perception is lower, as pilot projects are promoted by national or local governments, reducing both financial and technical barriers is facilitated. Successful development of projects and evidence of technical, technological and scientific advances will lead to a massive adoption of LECRA, learning from experiences and adapting them to actual necessities and conditions.

The project will generate the necessary knowledge to build new agriculture technological capacities, empowering producers to launching similar projects on their own. It is important to point out the ability of measuring climate change related indicators, resulting from reduced losses in production and farmers trained in best practices, having greater production capacity and improved social and economic capacity of beneficiaries. CIAT is a good vehicle for knowledge management given its solid research background and capacity, presence around the world, and strategic alliances with the productive sector. Specifically, the Technical Assistance and Learning Facility to be financed by the Project will be used to disseminate successful experiences, and to show how to participate and make better use of this financial opportunity.

Sustainable development potential

Economic co-benefits: Through the establishment of improved agricultural technology, it is expected that income increases, especially at local level, with impacts on economic development and poverty alleviation. Food security will be enhanced while reducing government investment. Also, avoided losses will mean lower costs for Government and lower insurance premium tolls. As productivity increases farmers will have higher incomes, improving livelihoods. The Project may help to increase the value of farmer activities and products through value chains. With building capacities, better trained farmers will generate greater job opportunities for them. Increasing returns to labour, returns to capital inputs, and returns to environmental inputs will increase sustainability.

Social co-benefits: Cultural practices will be combined with new technologies. The Project will influence the food security situation by increasing food availability, improving access and quality. In the case of natural disasters, the affected regions are to be less vulnerable and may ensure food provision. As population is less vulnerable to climate change and to extreme climate events health and safety are to increase. Social inclusion will be sought, with emphasis in strengthening the women´s role in adopting new cultural approaches, through an increased youth participation approach.

Environmental co-benefits:

- Improvement of soil quality: sustainable practices can increase organic matter in soil, improve rainfall infiltration and retention, and increase nutrient retention while reducing soil erosion.
- Improved water quality due to runoffs with less or without chemical fertilizers. Besides, LECRA has the potential to improve a segment of the hydrological cycle, as vegetation cover regulates the flow and purification of water.
- Biodiversity conservation: the potential improvement and/or conservation of habitats (as the agriculture frontier can be put to a hold through the project), multiple species will be able to thrive in the area of focus. The resulting greater biodiversity is valuable for climate and pest resilience and may be of use as a source of raw materials for the pharmaceutical industry.

- Reducing the carbon and water footprint will help save valuable resources related to water supply, and water treatment, energy, and land use change.

Needs of recipient

The project will attenuate the exposure to climate risks of selected crops and regions, as well as people surrounding its areas of influence. Colombia, highly exposed to La Niña and El Niño, has one of the highest rates of climate related disasters. The risk of occurrence of these events has also an impact on the country´s economic development due to the importance of trade in the economy. In Colombia losses due to climatic events sum up to 6.052 million USD from which the 7% corresponds to the agricultural sector (BID & CEPAL, 2012)

On the other hand, the investment necessary to develop a resilient and sustainable infrastructure system is very high, and the government cannot solely assume it. It is then necessary to co-finance the project with different investors from the private sector and with the help of international cooperation. This project will help decrease the perceived risk, as new and larger LECRA experiences get on the ground, and are properly disseminated.

A very important element of the project is also to strengthen the producer associations, in their ability to participate in promoting LECRA-oriented investments, and in their ability to monitor and expand successful experiences at scale.

Country ownership

In Colombia, the Government is aware on the challenges posed by climate change and the need for adaptation and mitigation, and sustainability. The National Development Plan 2014-2018 expressed the government's development vision for the years to come, which includes adaptation and mitigation actions to face climate change. The intended actions are to reduce vulnerability on the rural area, increase adaptation to climate change and other environmental phenomena based on ecosystem services and to provide a natural upstanding environment. Additionally, it establishes the necessity to develop mitigation and adaptation plans for productive systems on prioritized regions. The National Adaptation Plan includes Agriculture Production, Food Safety and Adaptation to climate change as one of the strategic lines of work. Moreover, sectorial action plans incorporating climate change oriented strategies are being developed. The Ministry of Agriculture and Rural Development has started agriculture and adaptation activities, with support of CIAT, and the CGIAR Climate Change and Food Safety Research Program (CCAFS), and from the producer associations such as FEDEARROZ, FENALCE, FEDEGAN, CENIPALMA, ASBAMA, and CENICAÑA.

The AFOLU sector, including agriculture is comprised in Colombia's National Determined Contribution (NDC) economy-wide target which commit to reduce its greenhouse gas emissions by 20% with respect to the projected Business-as-Usual Scenario (BAU) by 2030. Finally, the NDC include as well agriculture as a key adaptation priority.

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Effectiveness and efficiency

Cost effectiveness is associated with loss savings, CO2 emission reductions, major productivity and less vulnerability, associated to the financial resources invested. In particular, it is expected that the investments will help achieve: Reduced methane emissions thanks to efficient water management, manure, and energy generation on farm Reduced emissions from reduced use of fertilizers; Water reservoirs can reduce energy consumption related to extraction, treatment, and transport of water from external sources; Indirect reduction in emissions by using water-efficient irrigation systems; Significant above- and below-ground carbon sequestration; Reduced nitrogen application leading to less N2O emissions; Reduced organic waste and odor, elimination of pathogen.

In Colombia, CIAT has already demonstrated how to avoid losses from climate impacts on agriculture; and how to increase productivity through Site Specific Agriculture, and through improvements in genetic development. Specifically, following are some indicators of cost-effectiveness:

- Climate smart investments. In 2014, USD2.4 million were saved thanks to improving planning in the plantation of rice in the Caribbean coastal area of Colombia; specifically 1800 hectares were not planted in response to potential flooding. The cost involved amounted to about USD36,000, which make it a very cost effective case (USD1.5 cents per saved dollar)
- Genetic improvement. In 2015, CIAT reported that in two pilots (ie, rice in the center of Colombia and in the northeastern savannahs) the use of better crop varieties represented productivity increase values of USD23.9 million, at a cost of near USD800,000, for a B/C relation of 17, or a cost effectiveness of USD6 cents per additional dollar produced
- Site specific agriculture. For this projected component CIAT reported USD4.6 million in productivity increase for a maize pilot in Cordoba (Caribbean coastal area), at a cost of near USD170,000.

- Economic and financial return to be determined from actual expected revenues

Economic gains and financial returns are expected as the result of avoided losses, and productivity enhancement, as reported from the pilot cases above. Expected increased returns are also associated to:

- Lower expenditures in fertilizers consumption
- Improved pastures (planted with legumes) also avoid the need to recover soils or expand agriculture frontier, leading to less development costs
- increased food security leads to lower government expenditures
- Lower water requirements increased resilience of the system to climate variability, and decrease costs
- Reduction of costs associated to pest control as genetic improvements lead to more resistant varieties

Silvopastoral systems bolstered resilience of livestock production systems to climate variability

C. Indicative financing / Cost information (max. 3 pages)

C.1. Financing by components (max ½ page)

The Project financing structure is expected to be the following:

GCF senior loan (sovereign): USD25 million;

GCF grant: USD20 million;

CAF senior loan (sovereign): USD10.3 million;

CIAT´s CCAF co-financing (grant): USD2 million;

Producer associations co-financing: USD10 million;

Government of Colombia and donors (bilateral and private) grant for the Germplasm Bank enhancement: USD13.7 million

A preliminary budget estimate is presented below, which will be further detailed during the PPF implementation:

Component	Indicative cost (USD)	GCF financing			Co-financing			
		Amount (USD)	Loan (USD)	Grant (USD)	Amount (USD)	Loan (USD)	Grant (USD)	Name of Institutions
1.Generation and use of agro-climatic forecasting	16.000.000	11.000.000	6.000.000	5.000.000	5.000.000	3.000.000	2.000.000	CAF, CIAT, Producer Associations
2. Productive gap filling through Site Specific Agriculture.	21.700.000	13.200.000	7.000.000	6.200.000	8.500.000	4.000.000	4.500.000	CAF, CIAT, Producer Associations
3. New low carbon and resiliency	18.600.000	12.100.000	6.700.000	5.400.000	6.500.000	3.000.000	3.500.000	CAF, CIAT, Producer Associations

oriented technological options								
4.Impact assessment	4.300.000	3.300.000	2.300.000	1.000.000	1.000.000	300.000	700.000	CAF, CIAT, Producer Associations
5. MRV and carbon footprint	2.300.000	1.900.000	1.000.000	900.000	400.000	-	400.000	CAF, CIAT, Producer Associations
6. Water footprint assessment	1.500.000	1.100.000	600.000	500.000	400.000	-	400.000	CAF, CIAT, Producer Associations
7. Germplasm Bank enhancement	15.700.000	2.000.000	-	2.000.000	13.700.000	-	13.700.000	Gvt. of Colombia, other Donors
8.Knowledge Management Capacity building	2.908.025	2.400.000	1.400.000	1.000.000	508.025	-	508.025	CAF, CIAT, Producer Associations
Indicative total cost (USD)	83.008.025	47.000.000	25.000.000	22.000.000	36.008.025	10.300.000	25.708.025	

C.2. Justification of GCF funding request (max 1 page)

Agricultural investments are risky, as there is high uncertainty and vulnerability to unexpected climate events. GCF investment will help to increase the adaptive capacity of farmers and ranchers and will ensure that new agricultural makes them more resilient to climate change, and that the new LECRA technologies also help mitigate GHG emissions. Colombia has suffered the consequences of climatic events, which have affected important agricultural fields in many parts of the country causing millions in losses. As Colombia plans to upgrade a large part of agro-livestock infrastructure, productivity and competitiveness, there is need for enhancing the design and technical approach to agriculture and livestock raising, so the new or rehabilitated fields/crops last longer; and so that farmers and ranchers avoid and prepare for climate related events. Moreover, as the capital markets in Colombia are not yet ready for uptaking risks from new technologies, or new developments in new sites, GCF plays a fundamental role in making the risk manageable, and moreover, for making LECRA technologies mainstream, as they get adopted at scale.

As shown in section B.3 (sub-section on efficiency and effectiveness), in spite of the experiences showing very high returns on investments in LECRA technologies, there is a wide gap in Colombia for these technological options to be adopted at scale, and for becoming mainstream. Most of the reasons are related to the risks attached, and to the lack of institutional capacity to mobilize farmers in the right direction, both areas where the GCF participation can help change the paradigm.

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)

In general, more resilient agricultural practices, as well as knowledge and building capacity will allow the initiative to be replicated and to have a generational replacement. This project integrates capacity building in LECRA practices with capacity building in governance associated with LECRA. By emphasizing both the LECRA outcomes themselves as well as *how* LECRA is implemented, this effort serves to socialize a “LECRA mind-set” as integral to all agriculture decisions. Data collected will include metrics and/or reports on governance, business climate, economic instruments, financial information, value chains, areas under LECRA and management, project stakeholders, environmental and social outputs, knowledge generation and exchange, and state of execution and impact. The goal is to engage private sector to adopt LECRA technologies on their own.

Also, the intention of the project is to generate an experience that can be replicated in the other Latin American countries considering their unique specificities and potential across agricultural, social, environmental, economical, and political dimensions. The replication effect at the private sector level is also expected in those other countries.

C.4 Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)

In Colombia, CIAT has engaged with DNP (Colombia´s NDA), the Ministries of Environment, and of Agriculture, and with producer associations of main staples in the preparation of the Project and through preliminary LECRA experiences in the country.

In addition, the Project has undergone the national process to be incorporated in the GCF pipeline of Colombia and to receive the Letter of No-Objection for the PPF request from the NDA.

D. Supporting documents submitted (OPTIONAL)

☐ Map indicating the location of the project/programme

☒ Diagram of the theory of change

☐ Financial Model

☐ Pre-feasibility Study

☐ Evaluation Report of previous project

Self-awareness check boxes

Are you aware that the full Funding Proposal and Annexes will require these documents? Yes ☒ No ☐

- Feasibility Study
- Environmental and social impact assessment or environmental and social management framework
- Stakeholder consultations at national and project level implementation including with indigenous people if relevant
- Gender assessment and action plan
- Operations and maintenance plan if relevant
- Loan or grant operation manual as appropriate
- Co-financing commitment letters

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes ☒ No ☐

ANNEX

Logical Framework

Component	Crop	Baseline	Problem	Barriers	Project
Generation and use of agro-climatic forecasting	Maize	Already has agr-climatic forecasting capacity in main 3 production zones. Also it has institutional capacity to continue with the program	The technology has not been expanded to other producing regions	Limitations in staff capabilities for including new regions into the existing platform system	All regions producing maize have agr-climatic forecasting tools
	Beans	Producer association has agr-climatic forecasting capacity. However it does not have the crop growth modeling to relate to the climatic forecasts	Although the association has the capability for agr-climatic forecasting, it does not have the crop growth modeling to relate to the climatic forecasts	There are not enough resources for calibrating crop models	Bean models calibrated per variety and regions, and agr-climatic forecasting for main producing regions
	Sugarcane for refinated sugar	Producer association has agr-climatic forecasting capacity. However it does not have the crop growth modeling to relate to the climatic forecasts	There are no calibrated models for Colombian sugarcane varieties, and there is need to move towards automatic agr-climatic forecasting	Limitations in knowledge about management and calibration of models and integration of agr-climatic forecasting info to those models	Crop models calibrated for main varieties and automated agr-climatic forecasting
	Sugarcane for rough sugar	Very low capacity. There is no progress in this regard.	There is no consolidation and analysis of climatic databases from producing regions. Climate threats not characterized. No progress regarding agr-climatic serive, no forecasting	The association has a low capability and knowledge about agr-climatic analysis. And limitations in technical assistance reach	Agr-climatic service platform working, and connected to the national agriculture extensionists service, and producers trained in the main regions for integrating the climate information in decision making
	Banana	Very low capacity. It only has some initial attempts but not enough capacity to develop the technology on their own.	Although the association has the capability for agr--climatic forecasting, it does not have the crop growth modeling to relate to the climatic forecasts There are no calibrated models for crops, nor any progress in agr-climate forecasting	Technical capability limitations in the association to perform this type of work	Agr-climatic service platform working for the main producing regions
	Coffee	Even though they have good agri climatic information, there are no instruments of mechanisms to enable decisions at the farm level	Although the association has the capability for agr-climatic forecasting, it does not have the crop growth modeling to relate to the climatic forecasts There are no calibrated models for crops, nor any progress in agr-climate forecasting	Technical capability limitations in the association to perform this type of work	Agr-climatic service platform working for the main producing regions
	Potato	Very low capacity. There is no progress in this regard.	There is no consolidation and analysis of climatic databases from producing regions. Climate threats not characterized. No progress regarding agr-climatic serive, no forecasting	The association has a low capability and knowledge about agr-climatic analysis. And limitations in technical assistance reach	Agr-climatic service platform working, and connected to the national agriculture extensionists service, and producers trained in the main regions for integrating the climate information in decision making
	Cattle	Very Low capacity. There is no progress in this regard.	There is no consolidation and analysis of climatic databases from producing regions. Climate threats not characterized. No progress regarding agr-climatic serive, no forecasting	The association has a low capability and knowledge about agri-climatic analysis. And limitations in technical assistance reach	Agr-climatic service platform working, and connected to the national agriculture extensionists service, and producers trained in the main regions for integrating the climate information in decision making

Component	Crop	Baseline	Problem	Barriers	Project
Productive gap filling through Site Specific Agriculture	Maize	Already have capabilities, information and tools. However, scalating strategy has been moderated	Although the technology is being applied in the main 3 producing regions, it is necessary to support the association in the capacity building sessions for technicians and association staff in the use of the information. Currently only 2 staff manage the platform, and require support to scale up the information usage	Lack of resources in the association to promote capacity building programs for technicians and producers	All association technicians and producers from the different producing regions use information and data from the site specific agriculture platform to adjust technology packages to particular conditions
	Sugarcane for rough sugar	There is capacity, information, and tools. Also, a very ambitious scalating strategy	There is no basic information nor capacity for analysis. Weak technical assistance system prevents scaling up	The association has low analysis capacity and very limited site specific agriculture knowledge. It is an association with many technical assistance scope limitations	A site specific agriculture working and integrated to the national extensionist services. Producers in the main producing regions using information and data to adjust technological packages in their farms
	Banana	Very low capacity, although some producers have some registries. There is no progress in this regard.	Information and data collection and analysis is required, to generate a site specific agriculture platform	Limitations in technical capability for this type of analysis. Requires support	Site specific platform working and technological adjustments at farm level
	Coffee	Ithere is very good information but no progress.	Although the association has good information, there have not been good and necessary analyses undertaken	Limitations in technical capability for this type of analysis. Requires support	Site specific platform working for main regions and being used by the extensionist service
	Potato	Very low capacity and no information system. There is no progress in this regard.	There is no basic information nor capacity for analysis. Weak technical assistance system prevents scaling up	The association has low analysis capacity and very limited site specific agriculture knowledge. It is an association with many technical assistance scope limitations	A site specific agriculture working and integrated to the national extensionist services. Producers in the main producing regions using information and data to adjust technological packages in their farms
	Cattle	Very low capacity although some producers have some registries. There is no progress in this regard.	There is no basic information nor capacity for analysis. Weak technical assistance system prevents scaling up	The association has low analysis capacity and very limited site specific agriculture knowledge. It is an association with many technical assistance scope limitations	A site specific agriculture working and integrated to the national extensionist services. Producers in the main producing regions using information and data to adjust technological packages in their farms

Component	Crop	Baseline	Problem	Barriers	Project
Water footprint assessment	Sugarcane	There are some low water technologies and information, but need to develop scalating strategy	There is no information about water footprint of different technologies, and therefore there is no certainty about the technologies with lower water footprint that can be scalated to the regions	Costs for this type of analysis are high, and there is no budget to undertake this type of studies	Water footprints for different technologies, and those with lower WFP identified, and with a formulated scaling up plan, and agreed with the association and with public sector
	Banana	There is no progress in this regard.	There is no information about water footprint of different technologies, and therefore there is no certainty about the technologies with lower water footprint that can be scalated to the regions	Costs for this type of analysis are high, and there is no budget to undertake this type of studies. Also, the association has limitations to undertake this type of studies on its own	Water footprints for different technologies, and those with lower WFP identified, and with a formulated scaling up plan, and agreed with the association and with public sector

Component	Crop	Baseline	Problem	Barriers	Project
	Potato	Even though they have information and technologies, there is need to scale up	Though there are information and technologies, there is need to work on scaling strategies	There is no strategy for promoting these technologies	A strategy for promoting these technologies designed and implemented
	Cattle	There is information and analysis for 1 producer region	Although there is information for 1 region, there is not for the rest of producing regions. Also there is need to work on scaling approaches	There is no strategy for promoting these technologies	A strategy for promoting these technologies designed and implemented

Component	Crop	Baseline	Problem	Barriers	Project
New low carbon and resiliency oriented technological options	Rice	There is no progress in this regard.	There is no information about emission levels associated to different crop technologies. Neither have the low carbon technologies been identified and quantified. There is no mitigation plan or strategy in this crop at the association level in spite of being one of the most emitting crops	There is a lack of information and dissemination about low carbon technologies at commercial level and with strong scientific support about mitigation potential	Main mitigation strategies for rice planting identified and adopted in each region, and mitigation potential quantified, and implementation strategy formulated and agreed between public and private sector
	Sugarcane for refined sugar	There is no progress in this regard.	There is information about carbon footprint of different technologies, and there is no certainty about the low carbon technologies that can be scaled up to the region	Costs for this type of analysis are high, and there is no budget to undertake this type of studies.	Carbon footprint for different technologies, and those with larger mitigation potential identified and agreed between public and private sector
	Sugarcane for rough sugar	There is no progress in this regard.	There is a NAMA on sugarcane for rough sugar, which needs support on measurement, information and monitoring for supporting scaling up strategies	The association has budget and technical limitations to undertake this type of studies on its own	It will generate information about carbon footprint of different technologies to technically improve the sugarcane NAMA, and to support scaling up initiatives
	Banana	There is no progress in this regard.	There is information about carbon footprint of different technologies, and there is no certainty about the low carbon technologies that can be scaled up to the region	Costs for this type of analysis are high, and there is no budget to undertake this type of studies. Also, the association has limitations to undertake this type of studies on its own	Carbon footprint for different technologies, and those with larger mitigation potential identified and agreed between public and private sector
	Coffee	There is no progress in this regard.	There is information about carbon footprint of different technologies, and there is no certainty about the low carbon technologies that can be scaled up to the region	Costs for this type of analysis are high, and there is no budget to undertake this type of studies.	Carbon footprint for different technologies, and those with larger mitigation potential identified and agreed between public and private sector
	Potato	There are measurements and analysis and low carbon technologies have been identified for the 2 main producing regions.	Although there is information and technologies, it is necessary to work on scaling up strategies	There is no agreed scaling up plan between private and public sector	Scaling up plan and implementation strategy formulated and agreed between public and private sector
	Cattle	There are measurements and analysis, and low carbon technologies have been identified for 5 producing regions.	There are information, technologies and scaling up strategies. However scaling up at national level remains a challenge	There is a large area to cover and a multiplicity of regions and cattle ranching systems, which makes it a big challenge to scale up this technological approach	Support of scaling up identified measures

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Bogotá D.C., martes, 26 de diciembre de 2017

SDAS

Al responder cite este Nro.
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To: **THE GREEN CLIMATE FUND ("GCF")**
Email: countries@gcfund.org

Re: Proposal for the GCF Project Preparation Facility by CAF – regarding the project "Low-Emission and Climate Resilient Agriculture in Colombia".

Dear Madam, Sir,

We refer to the Project Preparation Facility the proposal *"Low-Emission and Climate Resilient Agriculture in Colombia"* for preparation of the full proposal as included in the PPF proposal submitted by *UN Environment and BANCOLDEX* to us on December 7th 2017 ("PPF Proposal").

The undersigned is the duly authorized representative of the National Planning Department as the National Designated Authority of Colombia.

Pursuant to GCF decisions B.08/10 and B.13/21, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the Project Preparation Facility activities as included in the PPF Proposal.

By communicating our no-objection, it is implied that:

(a) The government of Colombia has no-objection to the Project Preparation Facility request as included in the PPF Proposal;
(b) The PPF Proposal is in conformity with Colombia's national priorities, strategies and plans; and
(c) In accordance with the GCF's environmental and social safeguards, the PPF activities as included in the PPF Proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the PPF Proposal has been duly followed. In the Colombian case this included a prioritization process that allowed the identification of suitable projects to integrate to the country GCF portfolio. In addition CAF received feedback on the submitted concept note as a mean to strengthen the proposal.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

JAVIER IGNACIO PEREZ BURGOS
Ad Interim Deputy Director Territorial and Public Investment

Prepared: Sebastian Lema
Reviewed: Silvia L. Calderón Diaz S.L.