



PROJECT / PROGRAMME CONCEPT NOTE Template V.2.2

Project/Programme Title: Decreasing vulnerability to water shortages in Santa Marta, Ciénaga, and Zona Bananera

Country(ies): Colombia

National Designated Authority(ies) (NDA): National Planning Department (DNP)

Accredited Entity(ies) (AE): Conservation International (CI)

Date of first submission/ version number: [YYYY-MM-DD] [V.0]

Date of current submission/ version number: [YYYY-MM-DD] [V.0]

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](#).

i. Project/Programme Summary (max. 1 page)			
A.1. Project or programme	<input checked="" type="checkbox"/> Project <input type="checkbox"/> Programme	A.2. Public or private sector	<input checked="" type="checkbox"/> Public sector <input type="checkbox"/> Private sector
A.3. Is the CN submitted in response to an RFP?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, specify the RFP: _____	A.4. Confidentiality¹	<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Not confidential
A.5. Indicate the result areas for the project/programme	<p><u>Mitigation:</u> Reduced emissions from:</p> <input type="checkbox"/> Energy access and power generation <input type="checkbox"/> Low emission transport <input type="checkbox"/> Buildings, cities and industries and appliances <input type="checkbox"/> Forestry and land use <p><u>Adaptation:</u> Increased resilience of:</p> <input checked="" type="checkbox"/> Most vulnerable people and communities <input checked="" type="checkbox"/> Health and well-being, and food and water security <input type="checkbox"/> Infrastructure and built environment. <input checked="" type="checkbox"/> Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO₂eq over lifespan)		A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)	615,577 (50,4% Women = 310,201) 1.28% of the Colombian population
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD 50.5 M	A.9. Indicative GCF funding requested	Amount: USD 27 M
A.10. Mark the type of financial instrument requested for the GCF funding	<input checked="" type="checkbox"/> Grant <input type="checkbox"/> Reimbursable grant <input type="checkbox"/> Guarantees <input type="checkbox"/> Equity <input type="checkbox"/> Subordinated loan <input type="checkbox"/> Senior Loan <input type="checkbox"/> Other: specify _____		
A.11. Estimated duration of project/ programme:	a) disbursement period: 7 years b) repayment period, if applicable: N/A	A.12. Estimated project/ Programme lifespan	10 to 20 years
A.13. Is funding from the Project Preparation Facility requested?²	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Other support received <input checked="" type="checkbox"/> If so, by who: NAP Readiness Programme (GCF): Supporting Colombia's Adaptation Planning Process (COL-RS-003)	A.14. ESS category³	<input type="checkbox"/> A or I-1 <input checked="" type="checkbox"/> B or I-2 <input type="checkbox"/> C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has the CN been shared with the NDA?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.17. AMA signed (if submitted by AE)	Yes <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> No <input type="checkbox"/> 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>

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 See here for access to project preparation support request template and guidelines.

³ Refer to the Fund's environmental and social safeguards (Decision B.07/02)

<p>A.19. Project/Programme rationale, objectives, and approach of programme/project (max 100 words)</p>	<p><i>Brief summary of the problem statement and climate rationale, objective, and selected implementation approach, including the executing entity(ies) and other implementing partners.</i></p> <p>The northwestern region of the Sierra Nevada de Santa Marta (SNSM) in northern Colombia is highly vulnerable to water shortages as a result of droughts and changes in rainfall and river flow rates associated with climate change. Climate change is expected to reduce water supply by 46% due to a 1°C increase in temperature and between 10% and 30% decrease in precipitation for the period 2011-2040 based on a multi-scenario analysis that averages the four RCPs (RCP2.6, RCP4.5, RCP6.0, and RCP8.5). Funding is being requested from the Green Climate Fund in order to increase the water security of urban and rural water users in the river basins located in this region, based on improving the adaptive capacities of the most vulnerable communities, a stable supply of water ecosystem services and more resilient, productive, and diversified livelihoods in supply watersheds. These outcomes will be achieved through increased resilience through the conservation and restoration of key ecosystems in the provision of water regulation services and soil erosion control, including climate resilient rural water supply systems, adoption of climate-smart/water saving technologies, improved livelihoods of most vulnerable people to face the effects of climate variability and change, and through enhanced water governance under a changing climate. The Project will benefit 615,577 people inhabiting the urban centers of Santa Marta, and Ciénaga and Zona Bananera, which are located in the project target area, including Pueblo Viejo, which even though it is not located within the project area, it does obtain its water supply from one of the project watersheds (607,601 people), and 7,976 people from rural agricultural areas covering 12,772 hectares, over a period of 7 years. Conservation International (CI) as an Accredited Agency will lead this initiative, working with the Fundación Pro Sierra Nevada de Santa Marta, CI Colombia and a national financial entity that will administer an innovative financial mechanism to provide incentives that promote a more efficient use of water and climate-smart investments, jointly as Executing Entities, in coordination with the regional environmental authority (CORPAMAG), the Magdalena Government, the municipalities, the Santa Marta and Ciénaga Water Fund, agricultural co-ops, and local community organizations.</p>
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I. Project/Programme Information (max. 8 pages)

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

Describe the climate vulnerabilities and impacts, GHG emissions profile, and mitigation and adaptation need that the prospective intervention is envisaged to address.

The Sierra Nevada de Santa Marta (SNSM) is a mountain range located in northern Colombia that holds the headwaters of 33 watersheds. The project area includes 7 watersheds (Piedras, Manzanares, Gaira, Toribio, Córdoba, Frío and Sevilla rivers) in the northwestern region of the SNSM (Figure 1) that supply the water utilities that provide water to over 615,000 inhabitants and 12,772 hectares (ha) of agricultural land and irrigation districts of importance to the local and national economy. It also includes recharge zones of the Santa Marta and Ciénaga-Fundación aquifer systems that partially supply the water utilities of the municipality of Santa Marta and completely of Zona Bananera.

The primary current and projected climate changes that threaten urban and rural populations are: the projected 1°C increase in the average temperature, a decrease in precipitation of between 10% and 40% for the period 2011-2040, and an increase in the number of days without rain. These climate changes will affect: 1) the water security of urban populations and rural populated areas due to a 46% decrease in the water availability of rivers; 2) a decrease in the water security of palm oil and banana producers due to an increase in the irrigation requirements from water sources facing water scarcity; and 3) the deterioration of small rural producers' livelihoods whose main source of income is a single coffee harvest per year, a crop that is also impacted by climate change.

The northwestern region of the SNSM has an average annual precipitation of 1,800 mm and is characterized by a rainfall regime with a dry period (December - April) and a wet period (May - November). The higher elevations of the SNSM have higher precipitation (2,250 mm), while the zones of lower altitude have lower values (1,350 mm). Temperatures in the SNSM range from warm (above 24°C) in the lower elevations to very cold in the higher elevations (below 1.5°C). Climates coexist in the SNSM ranging from super-humid in the highest parts to arid at the coastal border, particularly towards the western sector.

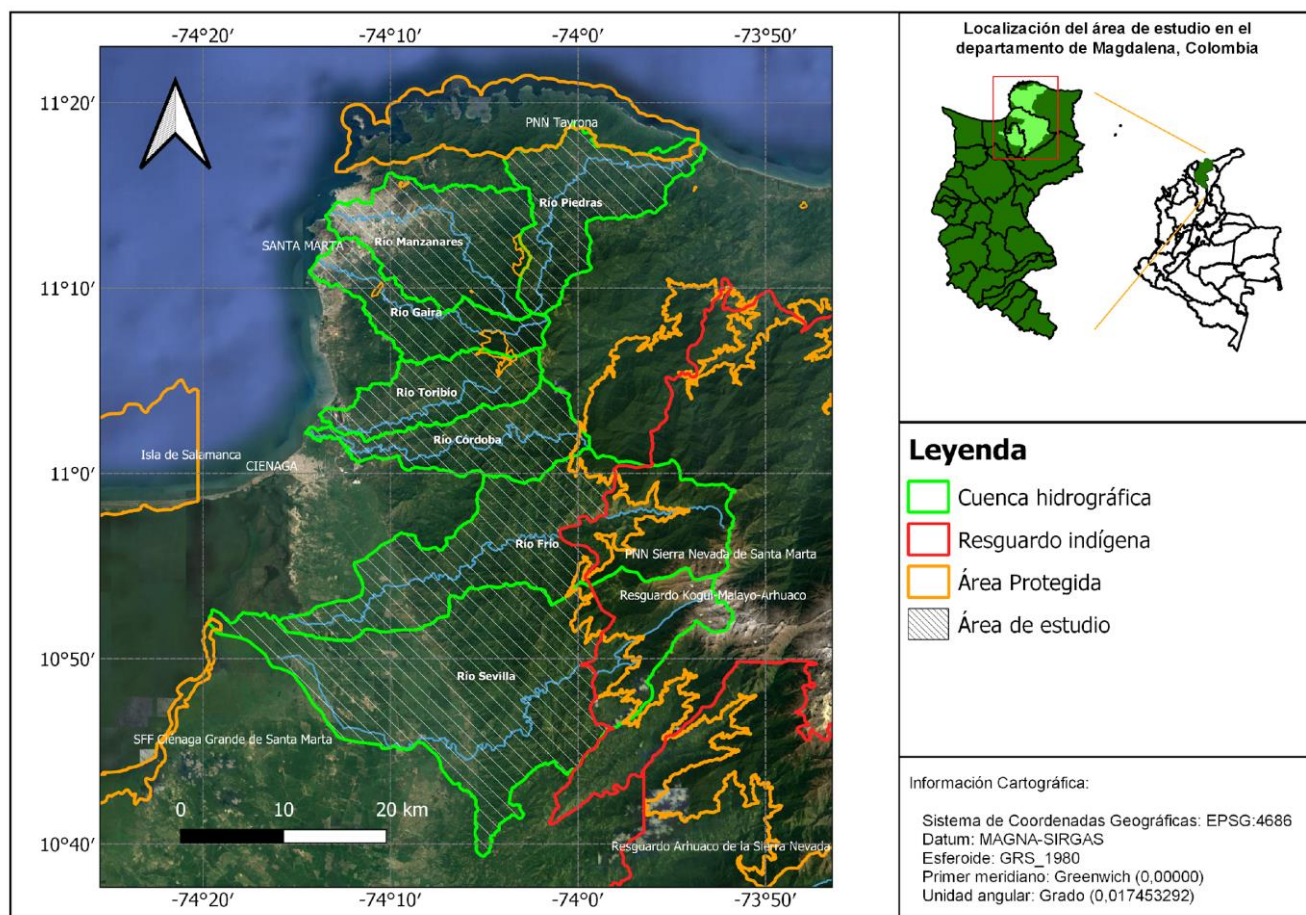


Figure 1. Project target area.

Climatic evidence

According to the climate change scenarios constructed in the Third National Communication of Colombia to the United Nations Framework Convention on Climate Change (TCNCC), the SNSM area is one of the four regions of Colombia that will be most threatened by climate change in terms of increased temperature, decreased precipitation, and increased extreme drought events.⁴ The TCNCC scenarios were constructed by analyzing data from 1976-2005 and projected to the periods 2011-2040, 2041-2070 and 2071-2100. For the 2011-2040 period in relation to the 1976-2005 reference period, the magnitude of changes in the average temperature for Colombia would be expected to increase by approximately 1.0°C in all of the four RCP scenarios analyzed by the TCNCC (RCP2.6, RCP4.5, RCP6.0 and RCP8.5) (IDEAM et. al 2017). The possible average, maximum and minimum values of mean temperature change in Colombia for the periods 2011-2040, 2041- 2070 and 2071-2100, would show the most significant increases especially in the high mountain areas including the SNSM, where the temperature would increase faster than in other parts of the country (IDEAM et. al 2017). Statistically significant results at 4 climate stations in the area of the project, already indicate average temperature increases of 0.8°C over the period 1980-2014 (Ecoveresa, 2021).

For the Department of Magdalena where the project target area is located, the RCP 4.5 scenario for the period 2011-2040 generated for the TCNCC projects an increase in temperature of 1.18°C +/- 0.09 and a decrease in annual precipitation of 20.03% +/- 1.12% (Figure 2). At the seasonal level, the strongest rainfall reductions (above 20%) would be observed in the Caribbean region, where the SNSM is located, in the March-April-May and September-October-November quarters (IDEAM et. al 2017).

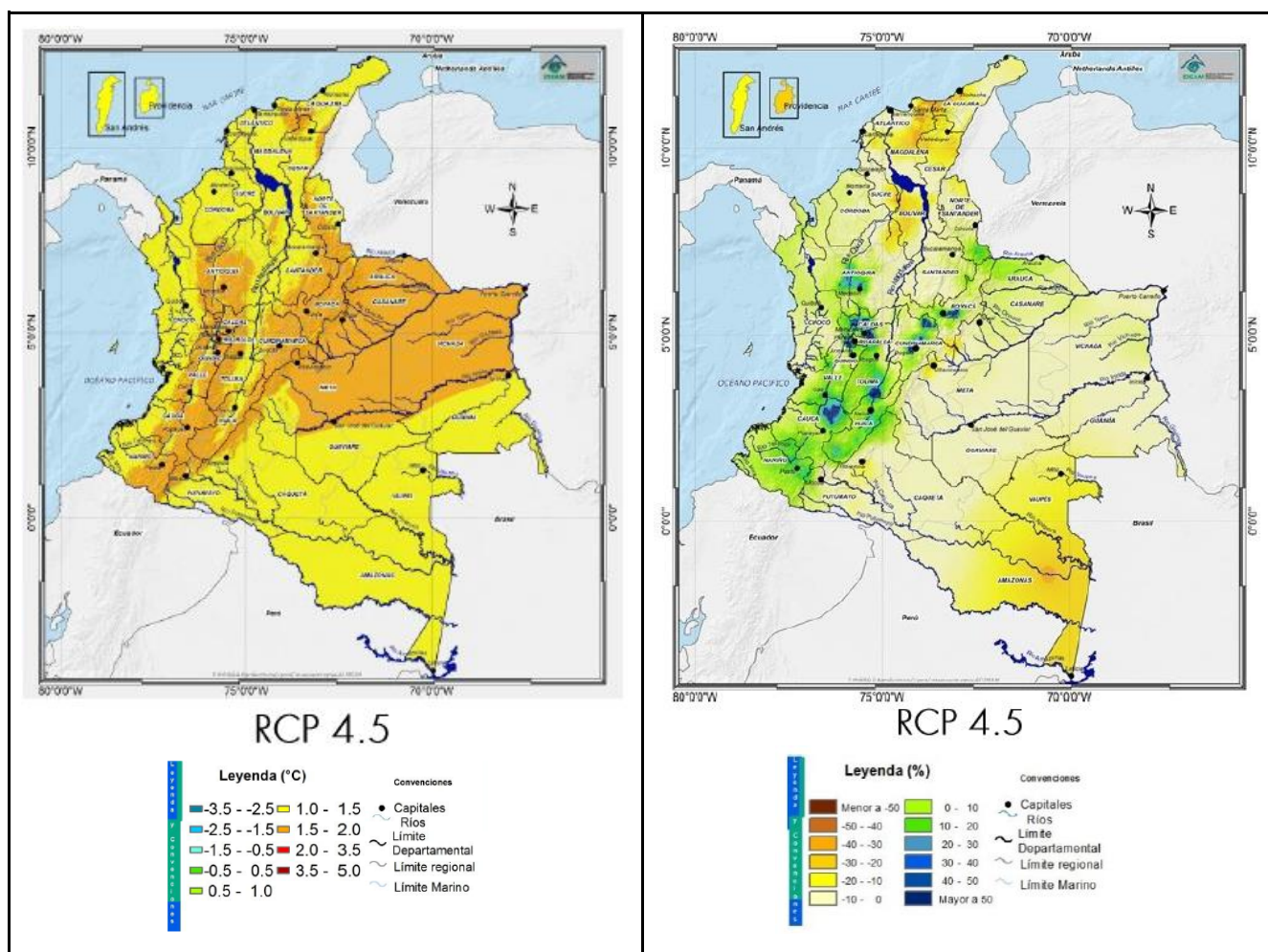


Figure 2. Projected change in mean temperature (left) and precipitation (right) for the period 2011-2040 with respect to the reference period 1976-2005 for climate change scenario RCP 4.5

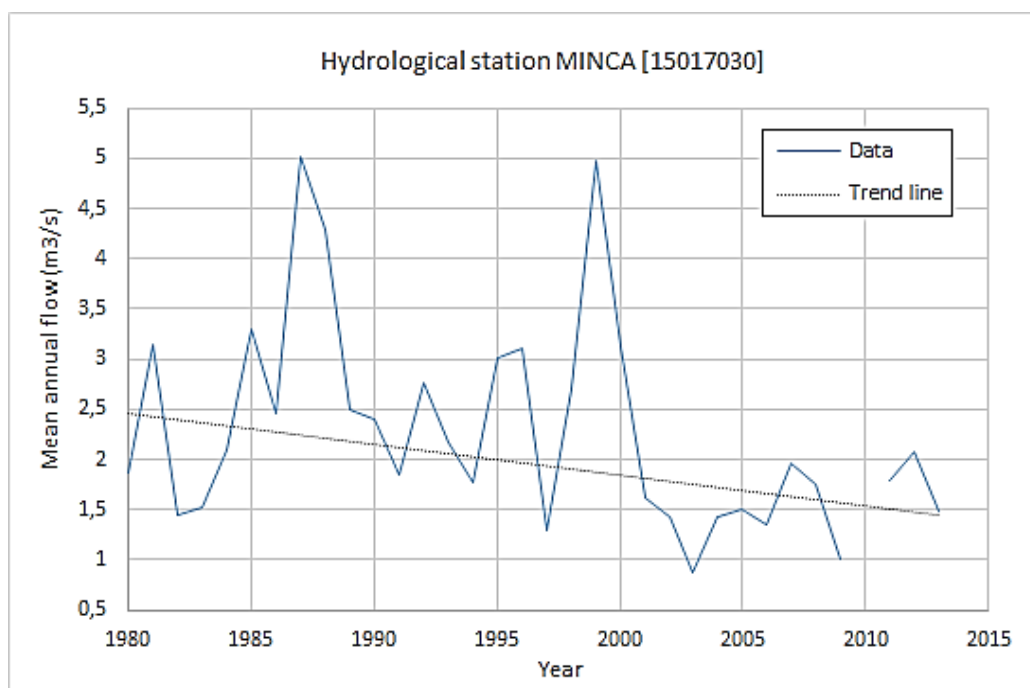
⁴ The information presented in TCNCC was derived using an aggregation of general circulation models (15 models) and weights the models according to two variables: performance (ability to reproduce present climate) and convergence (shortest distance with respect to the average change of all models) that is different from the aggregations models used by global platforms such as the Climate Change Knowledge Portal (16 models; <https://climateknowledgeportal.worldbank.org/>) and Think Hazard (<https://thinkhazard.org/>).

The SNSM is one of the four regions in the country where the TCNCC finds a trend towards an increase in the occurrence of consecutive dry days per year where it is expected that the phenomena associated with drought will have a slight upward trend in the coming years. At one station in the northwestern region of the SNSM it was evidenced that the duration of dry periods of precipitation increased during the period 1980-2014 from approximately 30 to 70 days with consecutive periods of 7 days with less precipitation than the established threshold (Figure 3, Ecovera 2021).

Impact and Vulnerability

Under the climate change scenarios of the TCNCC presented above, it is estimated that climate change will result in a 46% decrease in surface runoff by 2040 in the watersheds of the northwestern region of the SNSM that supply water to the city of Santa Marta, and the municipalities of Ciénaga, Pueblo Viejo and Zona Bananera. This was developed by applying spatial changes of precipitation and temperature from de TCNCC climate change scenarios for the 2011-2040 period, to the historical spatial data, and recalculating the water runoff. Those watersheds also supply water for two major irrigation districts (Sevilla and Río Frío) that cover 12,760 ha mainly cultivated in oil palm and banana.

Santa Marta, which is supplied by surface and groundwater sources, is the Colombian city with the largest population (484,025 people) in the category of very high risk of water shortages during the dry season⁵, also has insufficient supply during the rainy season and of low water demand during the low tourist season⁶. When El Niño (ENSO) phenomena occur, water rationing is prolonged; in 2011-2012, rationing affected all urban inhabitants for 37 days⁷. There is evidence of the reduction in the mean annual water flow in the rivers that supply the city of Santa Marta as measured at hydrological stations upstream of water intakes as can be observed in figures 3 and 4, and the reduction of mean annual precipitation in figure 5 for the meteorological station in the upper part of Toribio river catchment; this reduction would worsen with the expected reduction in precipitation. Several studies have been carried out to evaluate alternative sources of supply for the city, including the options of seawater desalination and supply from the Magdalena River. However, the most viable options include tapping other rivers in the northwestern region of the SNSM, such as the Toribio and Cordoba rivers (Uniandes 2014) or the Don Diego and Buritaca rivers (Magdalena Governor's office). Therefore, in the scenario of harnessing alternative sources for the city, adaptation to climate change in the northwestern region of the SNSM is needed to ensure a more stable supply of water for the city of Santa Marta. In Ciénaga, water utilities that are also supplied by surface sources originating in the SNSM are also affected by water rationing such as the one reported in 2019 when all its users were affected due to 5 days of rationing.



5 IDEAM, 2018.

6 DNP 2017.

7 SSPD 2020.

Figure 3. Historical mean annual flow - Hydrological station in the Gaira river upstream of one of Santa Marta's water utility intake.

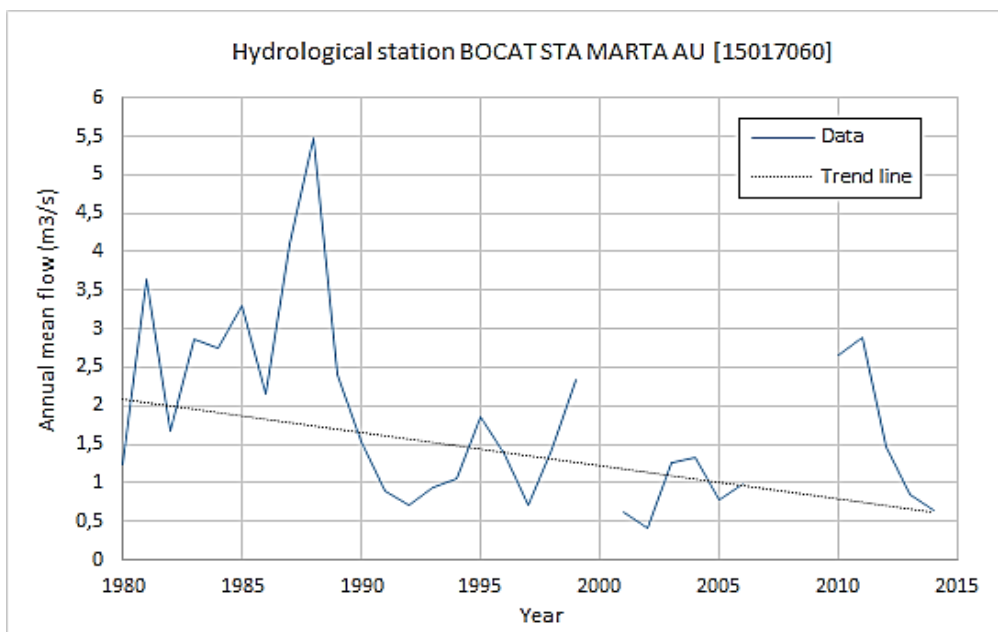


Figure 4. Historical mean annual flow - Hydrological station in the Manzanares river upstream of one of Santa Marta's water utility intake.

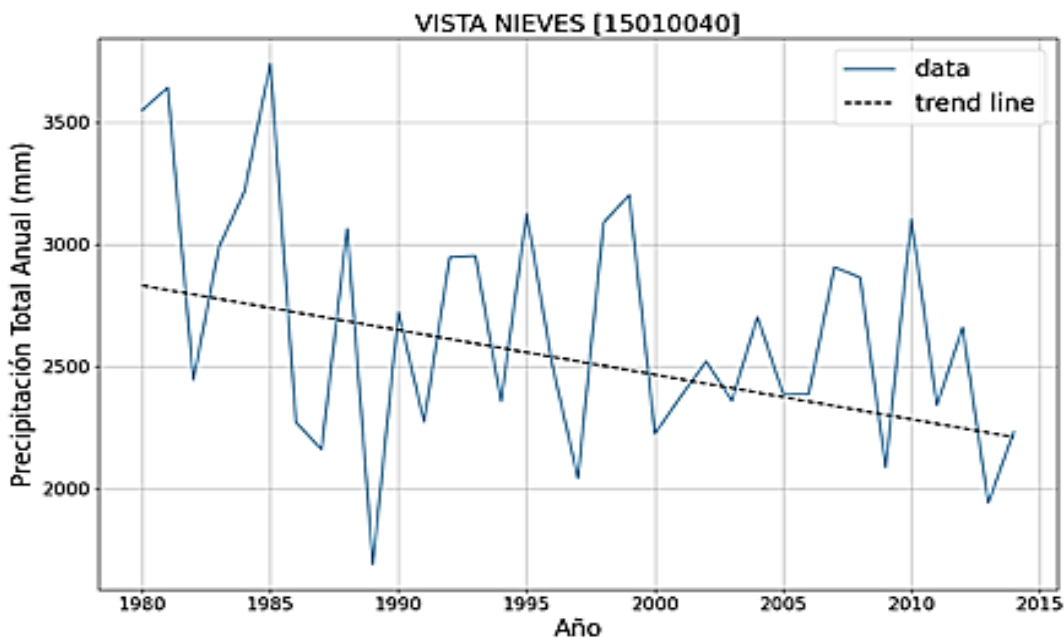


Figure 5. Historic annual precipitation - Vista Nieves rainfall station, located in the upper part of Toribio River Catchment.

The ENSO (El Niño and La Niña) phenomena have been more intense in the last 10 years than previously recorded, with significant economic impacts for the region. During La Niña (2010-2011), flooding affected 20,000 ha in the northwestern region of the SNSM of which 800 ha were banana plantations, and the rest were palm oil and subsistence crops. Direct losses were estimated at US\$13 million in the study area and 5,070 direct and indirect jobs associated with banana production were lost throughout the department of Magdalena. During the 2014 drought (El Niño) the Banana Association of Magdalena, La Guajira and Cesar (ASBAMA) reported that 1,200 ha were affected in the department of Magdalena of which 300 ha were severely affected and 30 ha were abandoned.

For 2014, it was estimated that there was a decrease in the yield per hectare of around 30% (from 48-50 bunches/ha/week to 34-36 bunches/ha/week) compared to previous years, and an economic loss in the department of Magdalena of US\$10 million. The rain deficit for the project area in 2014 - 2016 was higher (44.4%) than in the El Niño event 1997-1998 (10.5%), which was one of the most intense events since 1950.⁸ Overall, there has been a decrease in the production of bananas, palm oil, and other crops over the last 14 years with coffee being the exception (refer to Annex 1).

Increases in temperature will bring changes in the aptitude zones of coffee cultivation, pressuring its expansion to higher elevations, affecting areas where natural vegetation cover is important for the provision of water ecosystem services. It is estimated that in the municipalities of the northwestern sector of the SNSM, 3,937 ha of coffee cultivation will have a negative change in aptitude (reduction of more than 10% in the suitability index), while 11,200 ha will have a positive change in this index.⁹ However, the gains in suitability areas would occur at higher elevations where the ecosystems that currently provide greater ecosystem services of water regulation are found¹⁰. It is important to note that although the area of aptitude for coffee cultivation is mainly in the 600 to 1,800 m.a.s.l. (meters above sea level) range, in the northwestern region of the SNSM there is already evidence of the displacement of crops to higher elevations (up to 1,995 m above sea level). The location of coffee farms in the seven project watersheds and the forest area that are more likely to be deforested to produce coffee under climate change temperature scenarios is shown in Figure 6 (coffee areas between 1,500 – 2,000 m.a.s.l.)

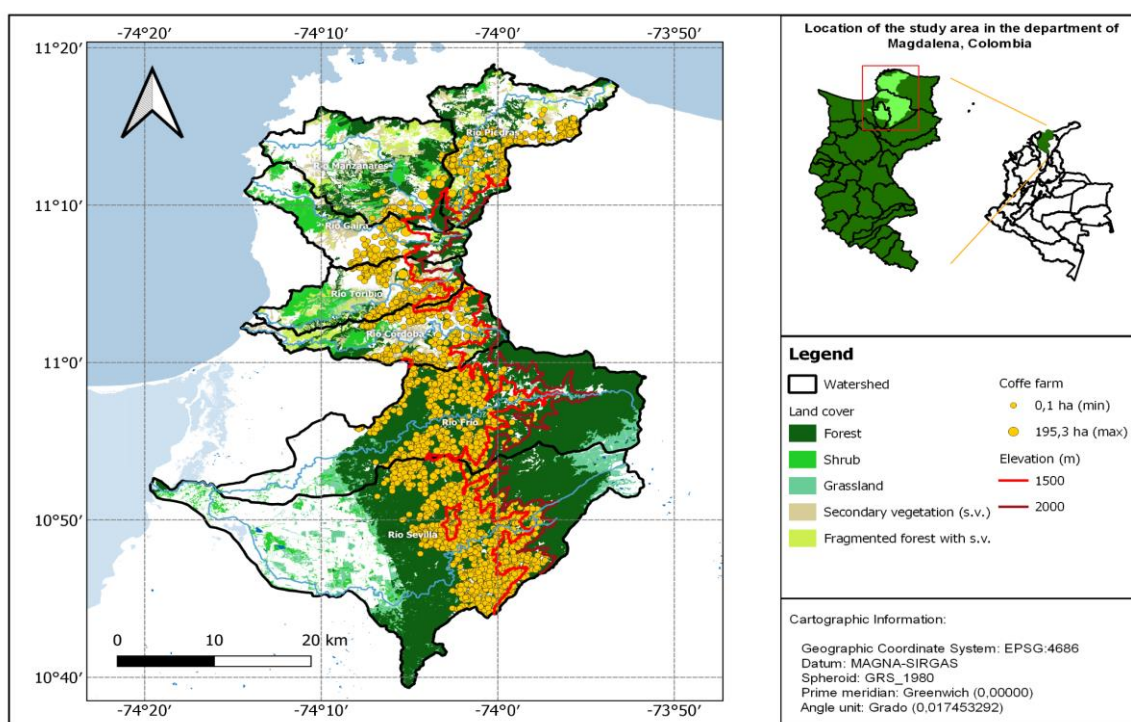


Figure 6. Location of coffee farms in the project seven watersheds.

Although there are no specific projections on the impacts of climate change on ecosystems in the SNSM, it has been shown that Andean forests in Colombia are responding to climate change in a directional and systematic manner, the distribution ranges of tree species could be shifting towards higher elevation sites and decreasing in extent because their lower limit is migrating altitudinally, in a process called "thermophilization", i.e., as a response to environmental warming¹¹. This suggests that the risk of species extinction and the loss of local biodiversity is increasing and indicates that the impact on connectivity together with accelerated climate change (including temperature increases and reduced water availability) will result in more rapid range shifts of forest species impacting biodiversity and the provision of ecosystem water services, among others.

8 Unidad Nacional para la Gestión del Riesgo de Desastres - UNGRD. 20.16. FENÓMENO EL NIÑO. Análisis Comparativo 1997 -1998 // 2014 -2016

9 García, Laderach, & Posada, 2018.

10 Ovalle-Rivera, Laderach, Bunn, Obersteiner, & Schroth, 2015.

11 Duque, A. et al., 2015.

Climate change will also be responsible for the increase in the frequency and severity of forest fires in the SNSM; in the project area, according to the forest fire threat zoning, recent information and the only available indicate that 34.56% of the “Management plan of the Piedras River, Manzanares River and other Direct to the Caribbean watersheds” has a high threat category, while 19.87% of the territory has a medium threat category.¹²

Impacts of Climate Change on Beneficiaries

The principal impact of climate change on rural water users will be a reduction in their harvests as shown in Annex 1 (Ecovera 2020). In addition, according to the national agriculture census (DANE, 2014) 41% of rural producers in the region state that droughts have affected their production activities. The most vulnerable producers are those with high levels of poverty, who do not have alternative sources of water for crop irrigation, and do not have access to credit or receive technical assistance. It is estimated that climate change will result in a 46% decrease in surface runoff and an increase in water demand for crop irrigation (Ecovera, 2021).

Among the different water users, 7,976 rural agricultural producers are the most vulnerable because they are the poorest population; the index of unsatisfied basic needs for this group varies between 25% and 49%. In addition, these producers use between 5 and 9% of their production for self-consumption, and if commercial production is affected by climate hazards, their food security will be affected by the impact on their income. Ninety percent of rural producers depend directly on rain, rivers, and streams for their water supply, only 19% have wells or some alternative storage system (cisterns or reservoirs) and only 7.18% have access to water through a district irrigation system.

Agricultural production is based on three main crops (bananas, oil palm and coffee), with less diversification over time. Each of these crops is represented by organized guilds and 71% of rural producers belong to a network, guild, co-op, or association, which is a strength to reduce their vulnerability to climate change. However, only 26% of farmers report having received technical assistance, and only 8% report having requested credit for their agricultural activity (Ecovera 2020).

Furthermore, most rural producers are located in the river basins where the intakes of the water utility of the city of Santa Marta and the Asoriofrio irrigation district are located, which also benefits the large-scale production of 3,862 ha of banana and palm oil¹³, making them compete for access to water resources that are increasingly scarce, especially during periods of drought, which extend between four and five months, as evidenced from one station where it has been recorded that the number of days without rain became increasingly larger during the period 1980-2014 (Figure 7). In addition, although the irrigation districts serve large-, medium-, and small-scale farmers, large-scale farmers have additional political/technological/ advantages for water access over small-scale farmers.

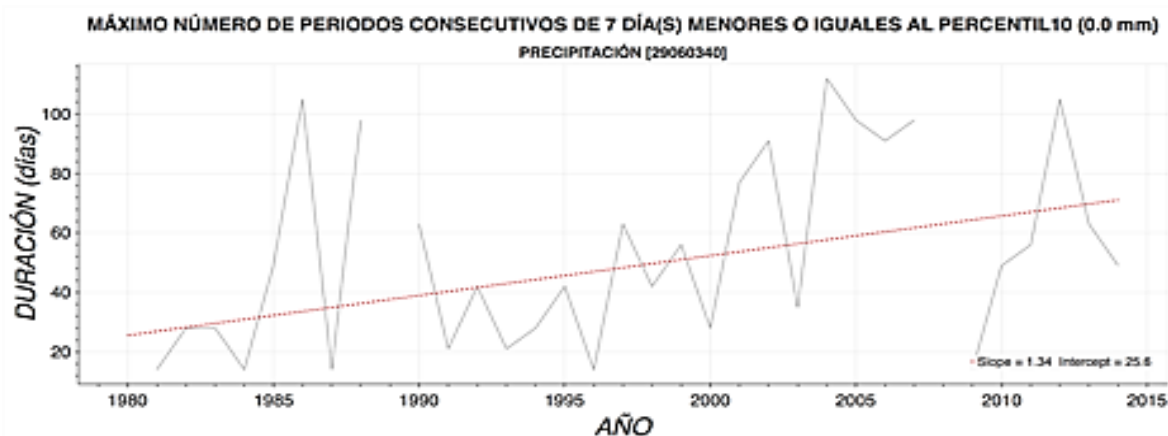


Figure 7. Number of days without rain in El Palmor station.

In addition, and according to interviews and a survey carried out in the project area, the community perceives drastic changes in the climate, which are a decrease in agricultural and livestock production (91% of those consulted); lower water levels in some rivers and streams that limit water supply during the dry season (14%); and changes in the sowing and harvesting cycles that have shifted almost two months (personal testimonies).

12. Watershed Management Plan (POMCA) Piedras, Manzanares and others direct rivers to the Caribbean, CORPAMAG, 2019

13 <http://asoriofrio.org/Normatividad/CONCESION%20CORPAMAG.pdf>

The principal impact of climate change to the urban population of Santa Marta, Ciénaga, Zona Bananera, and Pueblo Viejo, with a combined population of 607,601 people, is the rationing of drinkable water provided by the water utility companies due to reduced rainfall and increased temperatures. According to the accountability report of the Santa Marta water utility company for the year 2020 (Public Services Company of the District of Santa Marta [ESSMAR]), the water utility system under normal conditions presents a deficit of 500 l/s, which increases in drought conditions to 1,240 l/s. This affects the continuous provision of water to the point in which in parts of the city are only supplied one day a week during very dry periods (in 2017, the water utility service in Santa Marta supplied 83% of the population; users who do not have water utility service are mainly low-income and they incur s between 3 and 7 times higher than the cost of the water utility service to supply them from alternative sources (e.g., bottled water, water trucks, private suppliers, etc.)¹⁴, which are the same sources that the users of the water utility use during rationing, in addition to the disruption of their daily activities. Three of the possible new intakes would be located in three of project watersheds. In the short term, the water supply company plans to expand the El Roble Potable Water Treatment Plant (PWTP), which is supplied by the Gaira River, and build a PWTP for aquifer wells. In the medium term, two new PWTPs are projected to be supplied from the Guachaca, Piedras, Toribio and Córdoba rivers; the latter three in the project area. The water supply of the urban water utilities depends on stable ecosystem services and water regulation upstream; so, changes in the forest cover in the middle and upper part of these watersheds will reduce water flows affecting the stable supply of clean water service to urban centers.

The adaptive capacity of the municipal water companies is characterized by its institutional capacity for managing the water supply service, its financial capacity for investment and/or increasing tariffs. Only the Santa Marta water provider has a medium adaptive capacity due to its subscriber structure (Industrial, commercial, and high-income residential subscribers) and micro-metering coverage, however it has a very high percentage (71%) of non-revenue producing in-piping water supply network loss due to lifecycle end. The other two water companies of Ciénaga and Zona Bananera have low adaptive capacities since their subscriber structure does not allow them to make investments, the absence of micro-metering, and their high rate of unaccounted-for water losses (77% in Ciénaga).

Water users in the region depend on the ecosystems present in the SNSM (humid Andean forest, humid basal forest, riparian forests and fragmented forest with pastures and crops) and their water services which are vulnerable due to deforestation, agricultural expansion, forest fires, illicit crops, among others, which during the 2012-2017 period resulted in the loss of 2,361 ha; and by the increase of fragmentation, which is measured by number of patches, mainly due to agricultural expansion that increased by 39% during the period of 2010 to 2017 specially in the middle and upper part of the watersheds. According to the InVEST Seasonal Water Yield models developed for the region, forests, páramos (highlands), and secondary vegetation contribute approximately 60% of the base flow; that is, the flow available and related to dry seasons (Figure 8).

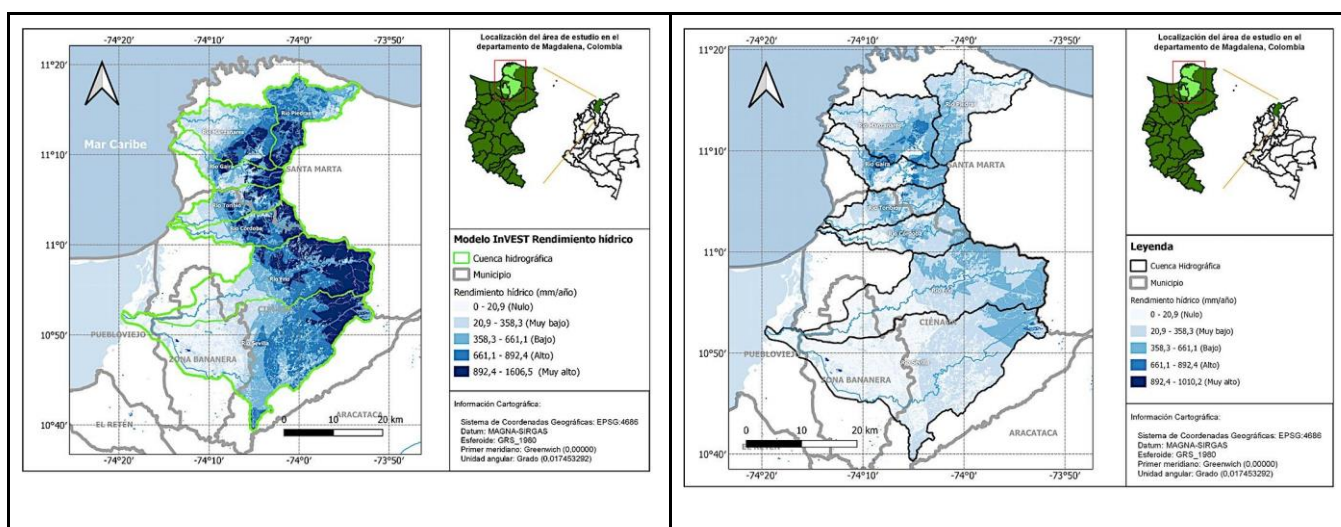


Figure 8. Water yield for base flow in the project watersheds (left, model run using historical temperature and precipitation; right, model run using expected temperature and precipitation with climate change for 2011-2040 (Source: Ecoversa 2021).

Although the watersheds have a total of 14% of their area under some form of protection, most of it corresponds to the areas of the Sierra Nevada de Santa Marta National Natural Park with a limited location in the upper parts of two of these watersheds (Frío and Sevilla rivers). Additionally, the ecosystems and their services are exposed to

being impacted by climatic threats due to reduced precipitation and increase in temperature; especially those located in areas with moderate to high aridity conditions. The results of the INVEST seasonal water yield model indicate that the increase in temperature and decrease in precipitation expected for the region during the period 2011-2040 will decrease the water regulation service by 64%, measured as a contribution to the base flow, compared to the historical average (1980-2014).

The regional environmental authority (CORPAMAG) has limited financial, technical and personnel capacity to face challenges such as the risk of water shortages; it has only 19% of the resources than other better organized and equipped regional environmental authorities in other parts of the country¹⁵. Although it has made significant progress in the implementation of planning instruments at the level of hydrographic subzones and plans to implement instruments to manage quality and contribute to solve scarcity problems in some of the project's basins, in addition to participating in the Integrated Territorial Climate Change Management Plan "Magdalena 2040" and having an Institutional Action Plan 2020-2023, it is highly deficient in terms of enforcement capacity, as the percentage of water used under official permits is estimated to be between 8% and 28% of the intakes, which indicates a low capacity of control over water users. This difficulty is mediated by a culture of non-payment of water rights fees, added to the lack of personnel for control and monitoring that limit the coverage of a geographically difficult-to-access area that was also affected by civil conflict.

In summary, the different water users (domestic, agricultural, industrial, institutional, and commercial) are vulnerable to climate change as they are currently facing a decrease in water security due to the increase in temperature and the change of rainfall patterns, which translates into more frequent and prolonged droughts in dry seasons and more floods and landslides in the rainy season. In urban areas, when there is drought, the social and economic impacts in the development and well-being of the community. The water shortages in over 50% of the city of Santa Marta have caused more than 500 children to miss school, as there is no water for cooking, laundry, or cleaning purposes. Additionally, families have to increase their spending on purchasing drinking water in bags. During the dry period between December/January and Easter, the hotel sector has to invest resources in transporting water in trucks to ensure the sufficient supply of water for the tourist population. Added to this, the commercialization of water by private companies is expanding, increasing the cost that urban users have to pay. This is aggravated by the low adaptive capacity of the institutions on which they depend to obtain climate information and technical support for the adoption of productive practices and technologies that would allow them to face climate change and reduce their vulnerability to water scarcity.

Please indicate how the project fits in with the country's national priorities and its full ownership of the concept. Is the project/programme directly contributing to the country's INDC/NDC or national climate strategies or other plans such as NAMAs, NAPs or equivalent? If so, please describe which priorities identified in these documents the proposed project is aiming to address and/or improve.

Colombia's Nationally Determined Contribution (NDC) updated in 2020 indicates as national priorities:

- The development of multi-sector interventions for conservation, protection, and management in the 24 priority watersheds and water supply sources (Goal 2: Water and Sanitation).
- The inclusion of climate change considerations in agricultural sector planning instruments and the implementation of innovative adaptation actions (Goal 17: Agriculture and Rural Development).
- The improvement of the capacities of agricultural subsectors, including bananas and coffee, to adapt to climate variability and/or climate change (Goal 18: Agriculture and Rural Development).
- The development of an Integrated Information System on Vulnerability, Risk and Adaptation to Climate Change, articulated to the SNICC, to analyze vulnerability and risk due to climate change and monitor the impact of climate change and evaluate adaptation in the country (Goal 20: Environment).
- Having instruments for watershed planning and management that contribute to reducing the risk and socioeconomic and eco systemic impacts associated with climate variability and change (Goal 21: Environment); and
- The implementation of restoration, rehabilitation, and recovery actions to improve the integrity of protected areas and their areas of influence in order to improve their capacity to adapt to climate change.

The project responds to each of these goals through its multiple actions.

The project is also closely aligned with the National Climate Change Adaptation Plan (PNACC), the basic planning mechanism for the NDC, which seeks to influence environmental, territorial and sectoral planning processes so that decisions are made in an informed manner, taking into account climate determinants and projections, thus effectively reducing vulnerability in populations, ecosystems and productive sectors and increasing social, economic

¹⁵ Economía Urbana, 2016.

and eco-systemic capacity to respond to climate events and disasters; objectives to which the actions proposed by the project contribute. The PNACC proposes five strategic lines of action: i. Raise awareness of climate change; ii. Generate information and knowledge to measure climate risk; iii. Land use planning; iv. Implement adaptation actions; and v. Strengthen reaction capacity, all of which guide the actions proposed in this project.

The project also contributes towards the objectives of the National Climate Change Policy (PNCC) adopted in 2017, which intends to incorporate climate change management into public and private decisions to progress along a path of increased climate resiliency and low-carbon development that reduces climate change risk and takes advantage of related opportunities. The PNCC adopts a territorial approach that places value on interacting sectoral development initiatives as a basis for achieving appropriate and effective climate change management. This will be possible through general and sectoral territorial strategies that contribute to climate change adaptation and mitigation, as well as specific guidelines for their articulation, so that different criteria and elements in the same territory are combined in an effective manner, which are necessary to link the climate change adaptation and mitigation assessments with relevant decisions around development. The following are the proposed territorial strategies: 1) climate-resilient, low-carbon urban development; 2) climate-resilient and low-carbon rural development; and 3) management and conservation of ecosystems and their services for low-carbon and climate-resilient development, to which this project contributes directly.

The project also responds to the objective of the National Policy for Integrated Water Resource Management (PNGIRH; 2010), which aims to ensure the sustainability of water resources through efficient and effective management and use, in coordination with land use planning, use and conservation of ecosystems that regulate water supply; considering water as a factor for economic development and social welfare and implementing equitable and inclusive participation processes.

The project is also aligned with the National Policy for the Integrated Management of Biodiversity and its Ecosystem Services (PNGIBSE; 2012), which aims to promote Integrated Management for the Conservation of Biodiversity and its Ecosystem Services, in order to maintain and improve the resilience of socio-ecological systems at the national, regional and local scales, considering scenarios of change and through joint, coordinated and concerted action by the State, the productive sector and civil society. In particular, the project contributes to Axis 1, *biodiversity, conservation, and care of nature*, by advancing actions that will contribute to in situ conservation, both in wild areas (protected or not) and transformed landscapes, so as to maintain viable populations of flora and fauna, the resilience of socio-ecological systems and sustain the provision of ecosystem services.

The compatibility of the project activities with the 2010 National Strategy for Education, Training, and Public Awareness on Climate Change is important as it establishes the guidelines for developing capacities around climate change at the local, regional, and national levels through the implementation, follow-up, monitoring, and evaluation of measures that promote access to information, build public awareness, training, education, research, and participation.

Finally, the project responds to Law 1523 of 2012, by which the National Disaster Risk Management Policy is adopted and the National Disaster Risk Management System is established in line with the proposals contained in the Climate Change Adaptation Plan; and to Law 1931 of 2018 that regulates the operation of the National Climate Change System and clearly defines its governance structure and functions at all levels of Government, articulates disaster risk management with actions to adapt to climate change, and defines the planning instruments for climate change management at the territorial and sectoral level, among others.

Describe the main root causes and barriers (social, gender, fiscal, regulatory, technological, financial, ecological, institutional, etc.) that need to be addressed.

The project addresses three root causes of water insecurity and low adaptive capacity of water users and institutions:

- i. The loss and degradation of ecosystems and their water ecosystem services are also one of the main causes of the decrease in water security in the region. According to the models developed for the region, forests, paramos, and secondary vegetation contribute approximately 60% of the base flow; that is, the flow available during dry seasons (Ecovera 2021). During the period from 2010 to 2017, 2,361 ha (3%) of forests have been lost in the seven project watersheds, principally due to the expansion of agriculture crops and pastures (Figure 9).

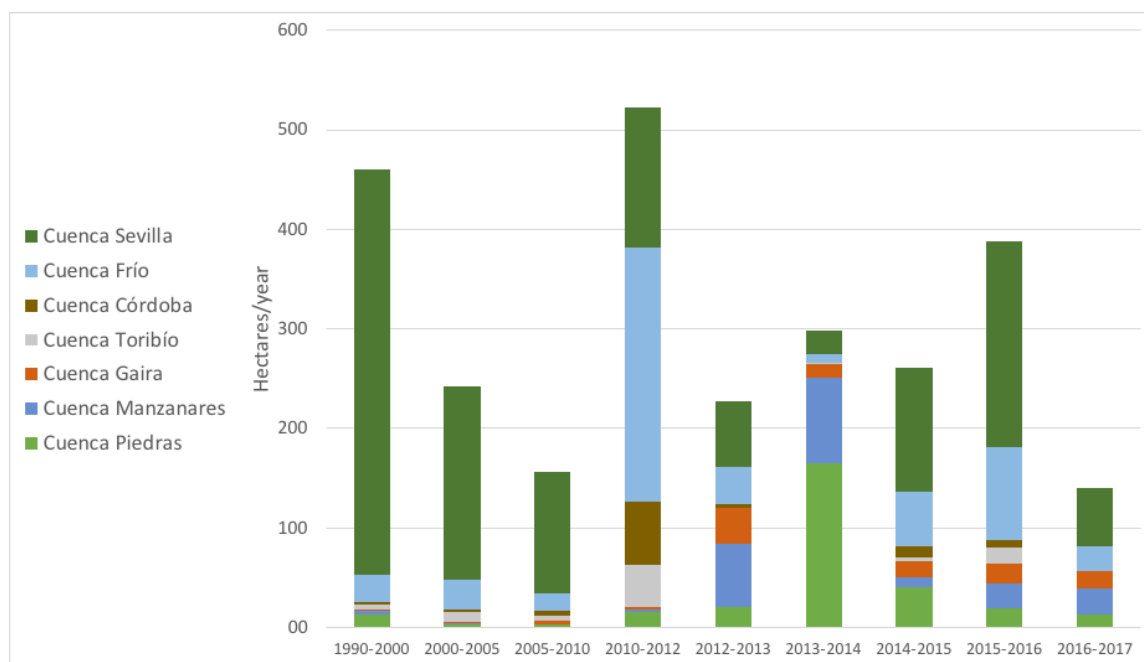


Figure 9. Annual deforestation (ha/year) in the seven-project watersheds during the period 1990-2017 (Source: IDEAM - Forest and Carbon Monitoring System)

During the same period, fragmentation, measured by number of forest remnants (patches), has increased by 39%. Changes in agricultural production systems and the loss of traditional livelihoods (loss of subsistence crops and diminished diversification), together with the lack of ecosystem protection and the absence of incentives for the conservation of ecosystems and their services, are the main causes of deforestation in the region. The unsustainable harvesting of firewood for cooking, forest timber for construction, and land clearing for cattle grazing also explain the fragmentation and degradation of the natural vegetation cover that is the basis for water regulation, on which urban and rural water utilities depend, as well as the irrigation systems essential for agricultural production. According to census data from the National Administrative Department of Statistics (DANE) for the years 2005 and 2018, the rural population in the municipality of Santa Marta between these years has increased by 28% but has decreased by 19% in the municipality of Ciénaga. In the municipality of Zona Bananera, it has increased by 427%; however, this municipality is located in the middle and lower parts of the Rio Frio and Sevilla basins where forest cover had already been replaced with agriculture; therefore, population growth is concentrated in urban areas and settlements and could be a minor deforestation driver in the rural areas. (Figure 10).

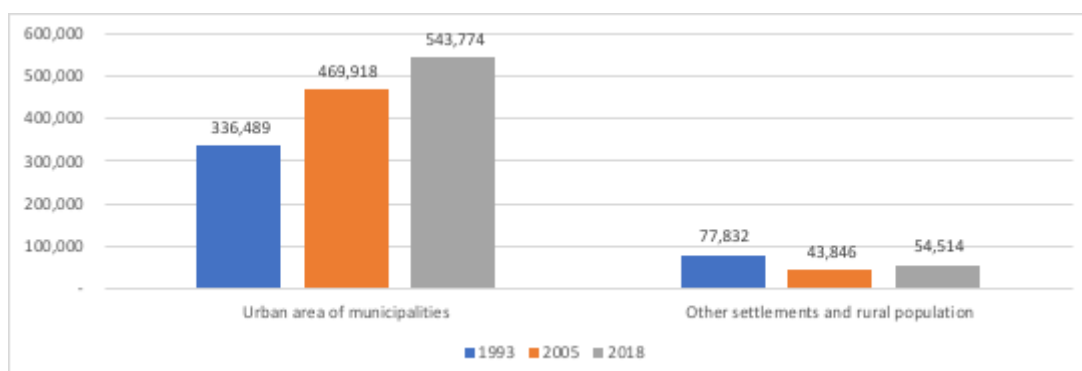


Figure 10. Population of the municipalities of Santa Marta and Ciénaga in 1993, 2005 and 2018 according to Census Data

- ii. Unsustainable water and soil management practices, mainly by vulnerable populations and other water users (municipal and local water utilities and irrigation districts), are causing even more damage due to climate change. Trends in the crop areas during the period 2007 to 2018 (refer to Annex 1) indicate the predominance of agro-industrial crops (oil palm, banana, and coffee) with high water requirements and decreasing yields; a decrease in traditional and subsistence crops (cassava, taro, beans, corn and plantain) and inefficient irrigation systems based on surface or flood irrigation practices; soil channels through which water infiltrates, among others. The replacement of traditional crops and ancestral farm management

- practices and their natural vegetation cover is explained by their low levels of income and productivity, compared to agro-industrial crops. Less than 26% of small producers report having received technical assistance, and only 8% report having requested credit for their agricultural activity, which allows them to improve their production systems, water, and soil management practices.
- iii. Persistent weakness in water governance systems to cope with climate variability and change impacts on water availability and an unmanaged increase in water demand for domestic, agricultural, industrial, and commercial use and inefficiency in water collection, distribution and use in these sectors combined with a reduced supply due to climate change factors. With an estimated informal access that is reflected in 8 - 28% of rural producers coverage of water permits for by, due to the high transaction costs for legal access, a culture of informality in access to water, and the lack of control and monitoring by the authorities, the increased demand and inefficient use by some users generates an inequitable distribution and reduces water availability. This situation is reflected in current water supply by informal hose networks and illegal well access and perforation. In addition, there is low social participation in water management and monitoring in the region. The fact that 72% of agricultural producers are unregulated implies a lack of control over the amount of water used and its equitable distribution, but also brings uncertainty about the amount of water available and prevents effective planning by users and environmental authorities/water management officials. Similarly, the lack of information about and monitoring of climate variables prevent effective long-term planning based upon climate change scenarios.

The underlying barriers for addressing the drivers of reduction in water security are:

- Lack of incentives or mechanisms for recognizing externalities of ecosystem services.
- Lack of knowledge of agricultural and environmental institutions regarding water resources, ecosystem services and the impact of climate change.
- Low adoption of climate resilient infrastructure by small and large producers.
- Lack of knowledge by small and large producers about good water and soil use practices and the use of inefficient production practices.
- Weaknesses in technical assistance and in the adoption of efficient water use alternatives.
- Lack of economic opportunities and alternative livelihoods.
- Deficiencies in availability of and access to information on water and ecosystem services by institutions and rural and urban water users.
- Limited capacity in regional and local entities for territorial planning related to areas for the supply of ecosystem services and productive activities under climate change scenarios.
- Limited governance for water resources management under climate change scenarios (e.g., high costs, lack of disclosure of permit procedures and processes, requirements, lack of knowledge of the benefits, prejudice against payment of fees, mechanisms for water control, use and distribution, etc.).

The proposed Project activities as described in Section B.2 are designed to address these barriers.

Where relevant, and particularly for private sector project/programme, please describe the key characteristics and dynamics of the sector or market in which the project/programme will operate.

N/A

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

Describe the expected set of components/outputs and subcomponents/activities to address the above barriers identified that will lead to the expected outcomes.

The objectives of the project are to increase the water security of urban and rural water users in the northwestern watersheds of the Sierra Nevada de Santa Marta by improving the adaptive capacities of the most vulnerable communities, enhance access to information and technologies by medium and large producers that will allow them to adopt climate-smart production practices, support a stable supply of water ecosystem services, and develop more resilient, productive and diversified livelihoods in the watersheds.

The project will address the root causes of the low adaptive capacity of water users and institutions in seven river basins, resulting in a more stable supply and enhancement of water resources for the well-being of the most vulnerable urban and rural populations and local and regional economies. In addition, it will provide practical solutions that are compatible with the needs of water users and with the socioeconomic and ecosystem context in which they live and will strengthen the integrated management of water resources considering climate change projected scenarios for the region.

The project will achieve three main results (components):

1. Increased resilience of vulnerable water users through the conservation (13,150 ha) and restoration (2,265 ha) of ecosystems (humid forests, riparian forests, and fragmented forests) and improved ecosystem services.
2. Reduced water insecurity (607,601 people) and improved livelihoods of people and communities (at least 6,310 persons) in regions most vulnerable to the effects of climate variability and change.
3. Improved / strengthened institutions to reduce beneficiaries' vulnerability of water supply to climate variability and change; one decision support system - DSS (modeling data to support quality decisions) for climate resilience and effective implementation in place.

These results will be obtained through the following outputs and activities:

1.1. Conservation and improvement of ecosystem services under climate change scenarios through PES. The indicative activities for the achievement of this output are:

- i. Strengthen the technical capacity of decision makers (e.g., Department of Magdalena and municipalities) to identify sites with potential for the implementation of PES schemes. Methodologies will be developed for site identification and mechanisms will be defined for coordinated decision-making between the different institutions that need to be involved.
- ii. Design and implementation of a conservation incentives system such as Payment for Environmental Services (PES program), for the conservation of 13,150 ha and restoration of 2,265 ha of natural vegetation covers (e.g., humid forests and riparian forest) that provide water ecosystem services (water regulation, protection against floods and landslide, etc.), integrating climate variability and change by updating modeling information, noting that the selection of the extension of areas to be conserved and restored was done using the projected climate change scenarios (RCP2.6, RCP4.5, RCP6.0, and RCP8.5). PES schemes will also address impacts of climate change on ecosystems; agroclimatic-zoning studies will be developed to manage the displacement of coffee crops to higher elevations that will result from the increase in temperature and that will impact high mountain ecosystems. The adoption of best practices such as increased shading of coffee crops will also contribute to reducing the pressure on ecosystems and the loss of productivity that results from the increase in temperature.

The beneficiaries of the incentive are approximately 1,422 land holders in the 7 watersheds that demonstrate interest (conservation or restoration agreements) in conserving or restoring those ecosystems that provide the water ecosystem services on their properties (in selected priority areas for the provision of water regulation services). In both cases, conservation and ecosystem restoration activities will be encouraged with greater contribution to the respective services to improve and increase the ecosystem adaptation and resilience. The PES program will be co-financed by public (Magdalena Governor's office and Mayors, and CORPAMAG) and private (oil palm, coffee and banana sectors, water supply enterprises, and the tourism sector) funds and operated through a financial mechanism created by the project.

2.1. Irrigation systems for efficient use and water harvesting for adaptation to climate change implemented through innovative climate financing schemes. The indicative activity for the achievement of this output is:

- i. Include incentives into existing climate finance instruments¹⁶ (i.e., loans) for access to technologies that adapt to climate variability and change by vulnerable populations (people with high levels of poverty, who do not have efficient irrigation systems, and do not have access to credit or receive technical assistance).¹⁷ The project will work with national banks that offer green loans to promote climate-smart practices for water catchment, distribution, and irrigation systems by agricultural users in the project's watersheds, providing technical support and incorporating the payment for water savings into the loans that target small producers who are most vulnerable to climate change. A similar instrument has been successfully implemented for reducing deforestation in the Colombian Amazon Region (*Programa REM Colombia Visión Amazonía-Instrumento Financiero Verde*). The payment for water savings will only be granted once the implementation and correct operation of the improved system on the farms is verified; the amount will be proportional to the amount of water saved with respect to the baseline system. Currently, less than 1% of banana and oil palm crops in the municipalities of the northwestern region of the SNSM use water-efficient irrigation technologies

¹⁶ Al respecto ver por ejemplo: [https://www.dnp.gov.co/Crecimiento-Verde/Documents/ejes-](https://www.dnp.gov.co/Crecimiento-Verde/Documents/ejes-tematicos/Econ%C3%B3micos/Productos%20A.%20Metodolog%C3%ADa%20y%20los%20criterios%20de%20priorizaci%C3%B3n%20de%20instrumentos.pdf)

[tematicos/Econ%C3%B3micos/Productos%20A.%20Metodolog%C3%ADa%20y%20los%20criterios%20de%20priorizaci%C3%B3n%20de%20instrumentos.pdf](https://www.dnp.gov.co/Crecimiento-Verde/Documents/ejes-tematicos/Econ%C3%B3micos/Productos%20A.%20Metodolog%C3%ADa%20y%20los%20criterios%20de%20priorizaci%C3%B3n%20de%20instrumentos.pdf)

¹⁷ The Project will also adopt the definition of a small producer defined in Law 16 of 1990: a small producer is a natural person who has total assets not exceeding two hundred and eighty-four (284) SMMLV, (minimum legal monthly salary), at the time of a credit operation. It must be demonstrated that these assets do not exceed that value, according to the commercial balance accepted by the financial intermediary and which should be valid only within 90 days after the loan application. This definition will be adapted based on the characteristics of the producers in the project target area and on the production sectors prioritized.

such as sprinklers or drip irrigation (DANE CNA 2014). The common irrigation practice is a gravity-based system using canals that have an estimated efficiency of between 10% and 20% (Cenipalma technical visit 2021). With technical assistance and the incentive to save water, the project will promote efficient irrigation practices among 890 small banana producers and palm oil crops that cover 10,860 ha. In addition, the project will develop an enabling environment for medium and large producers to access existing green loans that promote the adoption of adapted technologies. To facilitate access to loans, the project will establish agreements with public and private banks that offer these loans. The improvements in irrigation efficiency are aimed both at reducing water consumption and increasing the productivity of banana and oil palm crops.

2.2. Technologies and good practices for efficient water use implemented for adaptation to climate variability and change. The indicative activities for the achievement of this output are:

- i. Increased resilience and efficiency of the water utilities and irrigation districts, and improved of programs for water saving and efficient use: i. Technical support to existing rural service providers (rural water utilities) and irrigation districts (Asoriofrio and AsoSevilla) for the design and adoption and improvement of programs for water saving and efficient use; ii. Design and upscaling of a small-scale community-based climate resilient rural water utility using as reference the experiences of the Rural Aqueduct Associations (ASADAS) in Costa Rica¹⁸ and the Regional Autonomous Corporation of the Negro and Nare River Basins (CORNARE)¹⁹ in the department of Antioquia in Colombia to replace the supply of water using hoses and wells that are currently used and to manage appropriate water pipe distribution systems and small water storage options. Local communities through the Community Action Councils will operate rural water utilities, for which strengthened capacity for the association of rural water users for the construction, management, and operation of rural water utilities that are resilient to climate variability and change. This activity will contribute to replace the multiplicity of existing informal water intakes and the inefficient use of water, through awareness-raising and education. The capacity of rural communities in the Rio Piedras, Córdoba, and Toribio watersheds will be strengthened through the design and implementation of training modules and technical support for the strengthening and/or creation of community associations for providing water utility services with a gender and intercultural approach that will contribute to recognizing community water utilities as an efficient form of participatory water management and of appropriation and control of the territory. This will be possible since members of the community will be the same who would assume responsibility in the water supply chain, starting with the conservation of the ecosystems in the river basins, treatment, distribution, maintenance, collection of water fees, capital reinvestment, and continuous improvement.
- ii. Increase access of small rural producers to technologies for saving and efficient use of water in post-harvest processes, measures for the reuse of water resources and pollution control. This will facilitate access to small vulnerable rural producers to water saving technologies and efficient use of water in post-harvest processes, of coffee, oil palm and banana, seeking to facilitate access to technologies to enhance water distribution in climate change scenarios.
- iii. Adoption of family alternatives to improve the availability and quality of water resources under considerations of climate change and variability. With GCF funds, the project will facilitate access to technologies for rainwater harvesting and storage in rural areas, especially in the middle watersheds of the Piedras, Manzanares, Gaira, Sevilla and Frio river; access to water resources in these areas is dependent on the availability of rainwater that is scarce due to increasingly prolonged periods of drought (4 months) and to surface water sources located outside the pumping range, and to the low or no coverage of local water utilities. Likewise, it will facilitate access to technologies for the use of water with good quality for human and animal consumption of rainwater through access to technologies for the purification of water at the household level, and the conduction and storage of quality water for animal consumption.

2.3. More resilient livelihoods and generating positive water externalities. The indicative activities for the achievement of this output are:

- i. Integration of climate considerations in rural extension systems, this will be reach thought training programs of rural extension staff for the integration of water management and climate considerations in rural extension systems.
- ii. Participatory research to transition towards crops that are more resilient to climate change and variability, in particular, to water deficit.
- iii. Development and implementation of Property Adaptation Plans (PAPs) to face climate variability and change. This will include planning to adopt measures to reduce climate change impact, including agroforestry, land cover management, diversification for food security, the control and management of floods, fires, and landslides, among others. When the properties implementing PAPS coincide with the prioritized areas for the

18 <https://www.aya.go.cr/ASADAS/Paginas/default.aspx>

19 <https://repositorio.unal.edu.co/handle/unal/8214>

implementation of PES schemes, agreements with the landowners will be established that will be broader in scope and not only for PES. More resilient livelihoods will be possible since PAPs will be developed in a participatory manner and using new information about changes in rainfall and temperature overtime that will inform the transition to climate-smart production systems. Co-benefits of PAP implementation will include reduction in flooding and erosion, and the prevention and control of forest fires control through the restoration of some of the affected areas, environmental education and awareness-raising among producers that use fire as part of the production process, and through early warning systems. The PAPs will be developed with technical support provided by the project in coordination with producer organizations and will be implemented directly by the farmers/landowners who will provide the labor.

- iv. Strengthened Productive Alliances and promotion of nature-based alternatives that are more resilient to climate change and variability because are less demanding of water resources and that better tolerate drought periods for improved livelihoods: nature-based alternatives mainly including ecotourism and beekeeping; In the case of ecotourism, the project will train local groups as environmental guides; support the implementation of tourist packages including support materials for the dissemination of nature-based tourism information in the area; provide construction materials to small rural producers located in areas that provide water services, for the development of adequate infrastructure; and will support partnerships with tourism operators in the region as well as access to tourism registries. The Project will emphasize learning by doing during the construction of infrastructure (such as bird watching platforms, ecological trails, kiosks, dry toilets, among others) using local natural materials. For beekeeping, the project will implement a training program in beekeeping and will facilitate producers' access to materials and supplies for the installation and management of the hives, following the environmental guide for beekeeping. In addition, the project will provide support for the commercialization of products and for obtaining certification and green seals that recognize the socio-ecological value of production.

Nature-based alternatives will also be oriented to the recovery of agrobiodiversity and food security focusing on crops that are essential to the rural economy such as corn, cassava, banana, and beans, among others, increasing the offer of food products for local and regional consumption and improving the income of producers. In the areas of banana crops, women no longer make use of home gardens, project will promote the recovery of this practice through vertical gardens, small orchards, natural home gardens, among other practices, in which women can grow vegetables and aromatics for self-consumption. GCF resources will benefit families located in the middle sections of the watersheds where the drought is most extreme (Rio Frio, Sevilla, Piedras, Gaira and Manzanares) by establishing agri-food systems based on local agrobiodiversity and that demand less water. Similarly, the establishment of family gardens and the diversification with native species would be supported, as well as facilitating access to local markets and to the implementation of cost-saving mechanisms such as collective transportation of products, contributing to food security and income generation.

Regarding the strengthening of productive alliances (PA: and approach that strengthen the linkages between producers, buyers, and the public sector within agriculture value chains)²⁰ under climate change scenarios, the project will support, together with qualified national institutions, the development of additional market studies, as needed, to consolidate PAs considering climate change. To identify and select the agriculture chains, the following criteria will be considered: a) a lower demand for water resources; b) market opportunities that preferentially recognize the added value associated with the comprehensive management of water resources and the agroecological management of the territory; and c) the correspondence with the agroclimatic zoning based on the information generated under Output 1.2 for agro climatic planning activities at the local level. Based on an analysis of agro climatic aptitudes of farms under climate change scenarios and under the principle of production diversification, the project will launch a call for proposal to support PAs of small producers that are in the most vulnerable areas, and which will complement their principal productive activities or in support for their productive reorientation, given the climatic conditions that affect their productive systems.

3.1 Strengthening a weak hydroclimatic information network for adaptation to climate change and variability, for institutions that generate and demand information about climate, climate change and water availability. The indicative activities for achieving this output are:

- i. Expansion and operation of the system for monitoring water resources and ecosystem services under scenarios of climate change and variability. In the seven watersheds of the target area currently there are two watersheds without hydrological stations (Toribio and Córdoba rivers) and three with only one (Piedras, Gaira and Frío rivers); accordingly, the project will establish additional stations in order to have a more complete dataset of river flows, rainfall, and other climatic variables.

- ii. Information generation. The climate and hydrological information will be developed by ProSierra, which will control the monitoring system platform and the preparation of monthly hydrometeorological reports for the seven basins. An improved dataset will allow the development of more complete hydroclimatic analyses that will result in more accurate predictions about climate change and more timely and frequent warning reports regarding climate-related threats, including floods, drought, forest fires, and landslides through the generation of early warnings (DSS). Also, hydrological modeling information will be developed including WEAP (Water Evaluation and Planning) rainfall-runoff model, evaluation of water supply and demand, water yield modeling, WEAP-type model for only dry and rainy seasons and hydrometeorological forecasts. Modeling and generation of early warnings (DSS) will allow producers and the general population to take measures related to both their productive activities and their livelihoods based on hydroclimatic information both in real time and based on projections. Likewise, as part of the DSS, modeling will identify vulnerability of agro climatic areas that will allow both public and private decision-makers to improve planning and the development of agricultural activities considering climate change; and
- iii. Make information available in the short, medium, and long terms to decision makers and water users through hydrometeorological reports, early warning systems and climate change forecasts. Make information available in the short, medium, and long terms to decision makers and water users through early warning systems and climate change forecasts.

3.2. Development of territorial, sectoral, and environmental planning tools for integrating climate variability and change considerations at the watershed scale. The indicative activities for the achievement of this output are:

- i. Based on the Ecological Network EN (defined as strategic ecosystems that guarantee the integrity of biodiversity and the provision of ecosystem services in order to satisfy the basic needs of the population; the EN is category of land use that defines management strategies that are not limited to protected areas, but also include biological corridors and production areas with ecological functionality)²¹, an Adaptive Ecological Network (AEN) will be developed according to medium and long term scenarios of climate change and variability that will allow the conservation and restoration of areas important for the provision of ecosystem services. This strategy for adaptation to climate change will be built in a participatory manner with an adaptive approach at the watershed level (1:10,000 to 1:25,000) based on the existing ecological network for the area under the jurisdiction of CORPAMAG at a scale of 1:100,000, together with awareness-raising and educational strategies for its integration into the planning and management of the seven watersheds considered by the project; this information will be available to be used for updating the Watershed Management Plans (POMCA) and the municipal land use lands (POT).
- ii. Development of tools for analyzing changes in the extension of optimal agro-climatic zones for major food security crops (e.g., banana, beans, maize, and cassava), and market-based agricultural products based on climate variability and change scenarios and using a comprehensive landscape approach. These tools will complement the AEN in line with the priorities for facing the threats caused by changes in agro climatic conditions for productive activities and the increase of the imbalance between the supply and demand of water resource defined in the Comprehensive Plan for the Management of Climate Change of Magdalena 2040 (PIGCCTM, acronym in Spanish), and will be supported with the development of a decision-making platform for production management aimed at reducing water insecurity associated with commercial and subsistence agricultural production (producers will contributing directly to implementation through co financing);

3.3. Public, private sector, and civil society institutions and local communities strengthened for water management under scenarios of climate change and variability. The indicative activities for the achievement of this output are:

- i. Design and appropriation of educational and awareness tools for adaptive water management aimed at raising awareness about the value of water, the importance of climate change in environmental education, changing perceptions around risk and the recognition of community knowledge as the principal element for adaptation planning, and helping to improve cooperation between civil society and the public sector. The representatives of community and agricultural associations and women's groups have knowledge and information gaps related to how to manage water resources with an adaptive water management perspective (e.g., limiting their ability for climatically informed decision-making. Accordingly, a set of educational and awareness tools will be designed to share climate and environmental knowledge to the inhabitants of the seven basins through communication, non-formal education, and outreach. The generation of knowledge at the local level should be seen as a two-way process within the project, not only creating new capacities with local communities, but also providing

- a means by which their traditional knowledge and practices can be integrated into the project's actions for the adaptation to climate change.
- ii. Strengthened multistakeholder water governance platforms for climate-informed decision-making and appropriate resource allocation, building on the existent platforms such as the Watershed Council, the Santa Marta and Ciénaga Water Fund, and the platform for the custody of the water of the Río Frío and Sevilla rivers. These are recognized mechanisms used to coordinate efforts between different stakeholders around the integral management of water resources, but that need to be strengthened so that the different stakeholders can more effectively generate and exchange information about their watersheds to inform decision-making and for establishing agreements for solving conflicts, promote research and efficiently achieve the integral management of water resources. The Watershed Council, which provides available information on the overall condition of the watershed and serves as a consultation space in the formulation of the POMCA, needs to be strengthened in terms of adaptive water management and the role it can play in decision-making in the watershed. Likewise, the Santa Marta and Ciénaga Water Fund requires information to guide the decisions that each party institution must make and needs to be strengthened in its capacity to coordinate with the entities that generate the information to make technically supported decisions. A successful case that is worth taking advantage of is the experience of the platform for the custody of the water of the Río Frío and Sevilla rivers set up by World Wildlife Fund for Nature (WWF), which can be replicated in other five watersheds, in terms of collective action in the territory through dialogue and coordination for public and private participation for improve water governance.

In terms of rationale, please describe the theory of change and provide information on how it serves to shift the development pathway toward a more low-emissions and/or climate resilient direction, in line with the Fund's goals and objectives.

If water shortages are addressed, support to rural producers' that are dependent on watershed services is provided, and adaptive capacities of vulnerable rural and urban populations and impacted ecosystems are enhanced, then the provision of water ecosystem services will be sustained and improved and there will be more resilient, productive, and diversified livelihoods in supply watersheds, because private and public investments and a financial mechanism will be catalyzed and made available to support the conservation and restoration of ecosystems and ecosystem services, sustainable water use and adaptive production practices, and enhanced water governance, allowing to achieve the objective of increasing the water security of urban and rural water users in the northwestern watersheds of the Sierra Nevada de Santa Marta.

The results/components and products indicated above are part of the Project's Theory of Change (ToC), which is presented in Figure 11. The project's ToC will allow overcoming the identified barriers through three causal pathways:

1) Governance for adaptation and risk reduction: the barrier regarding deficiencies in knowledge and access to information on water and ecosystem services will be overcome by expanding the system for monitoring water resources and ecosystem services under scenarios of climate change and variability, and by making this information available to decision makers and water users. The barrier regarding limited capacity in regional and local entities for territorial planning related to areas for the supply of ecosystem services and productive activities under climate change scenarios will be overcome by identifying ecological network scenarios of climate variability and change for territorial planning and the development of a decision-making platform for production management aimed at reducing water insecurity associated with commercial and subsistence agricultural production. The barriers regarding limited governance for water resources management under climate change will be addressed by strengthening the capacity for the association of rural water users for the construction, management, and operation of rural water utilities that are resilient to climate variability and change and of multi stakeholders water governance platforms for climate-informed decision-making and appropriate resource allocation. This will result in enhanced water governance (i.e., a decision support system for climate resilience and effective implementation in place).

2) Ecosystem resilience: the barriers regarding lack of incentives or mechanisms for recognizing externalities of ecosystem services and of knowledge of agricultural and environmental sectors regarding water resources, ecosystem services and the impact of climate change, will be addressed through the implementation of a system of incentives such as PES schemes that will result in the conservation and improvement of ecosystem services under climate change scenarios, including the conservation of 13,150 ha of key ecosystems and the restoration of 2,265 ha of degraded areas.

3) **Resilience of the most vulnerable population:** the barriers regarding low adoption of water adapted infrastructure by small and large producers and lack of knowledge by small and large producers about good water and soil use practices and the use of inefficient production practices, will be overcome by the integration of incentives in climate finance instruments for access to technologies that adapt to climate variability and change by vulnerable populations, the construction of pilot small-scale and climate resilient rural water utilities; and the adoption of family alternatives to improve the availability and quality of water resources under considerations of climate variability and change. The barriers regarding weaknesses in technical assistance and in the adoption of efficient water use alternatives will be addressed by training rural extension staff for the integration of water management and climate considerations in rural extension systems and the generation of processes for participatory research on and transition to crops that are more resilient to climate variability and change and, in particular, to water deficit. Finally, the lack of economic opportunities and alternative livelihoods will be solved through PAPs to face climate change and variability (in particular to water deficit) and the promotion of nature-based alternatives (e.g., ecotourism, beekeeping, and non-timber forest and agroforestry products) and strengthening market-based agri-food value chains that are less demanding of water resources and more resilient climate change and variability.

The overall project activities will result in reduced water insecurity for 607,601 persons with water utility intakes in more resilient watersheds able to provide enhanced environmental services and improved livelihoods for 1,422 families' beneficiaries of PES payments, 890 small producers of banana and oil palm that adopt climate-smart production practices, and 1,000 rural families that make use nature-based alternatives.

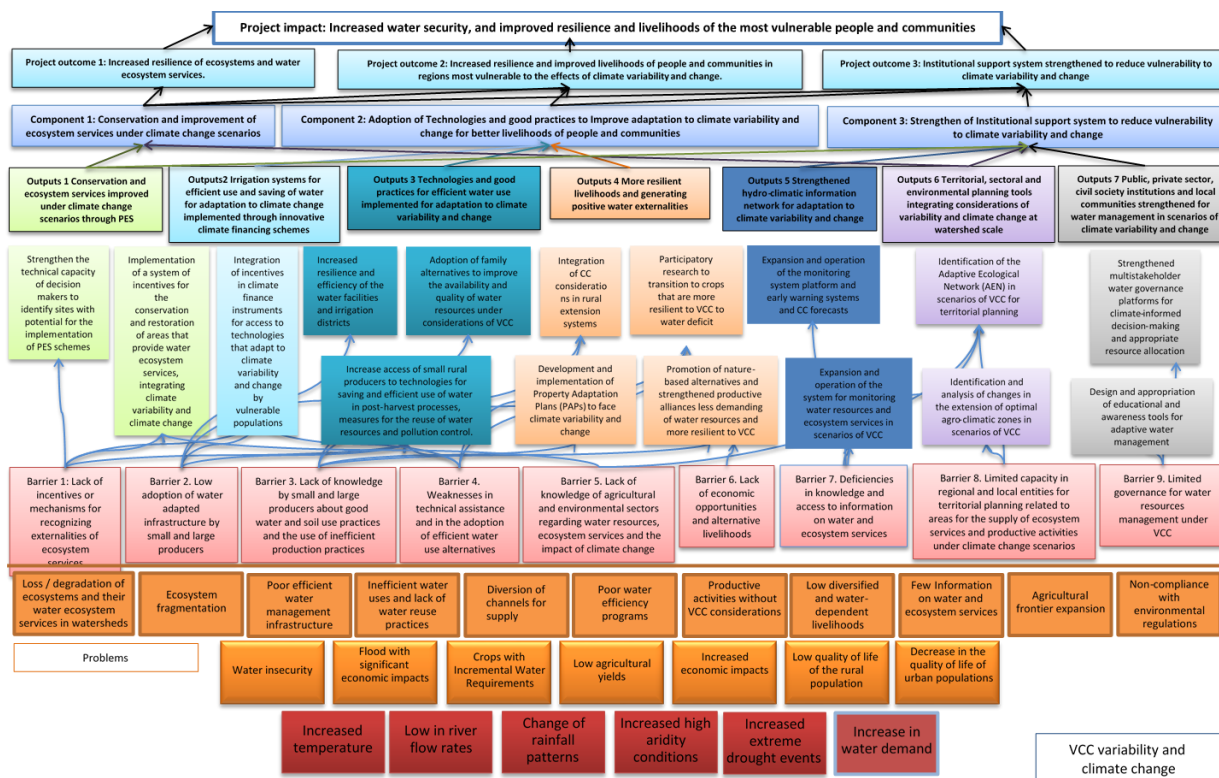


Figure 11. Theory of Change²².

This contributes to the adaptation impacts of the Green Climate Fund, which aims to improve the resilience of people, communities, and the most vulnerable regions; food and water security; and ecosystems and their ecosystem services.

Describe how activities in the proposal are consistent with national regulatory and legal framework, if applicable.

All project activities are consistent with existing legislation, including Law 1931 of 2018, which regulates the functioning of the National Climate Change System, the National Climate Change Policy (2017) and the National Disaster Risk Management Policy (2012), among others. The Result / Component 1 of the project will contribute to strengthen the institutional framework and governance for climate change management at territorial and sectoral level for adaptation to change as well as to generate information to measure climate risk; while the Results /

Components 2 and 3 of the projects will enable the implementation of specific adaptation actions, in line with the main premises of the country's climate change policy and regulatory framework.

The project is also consistent with the National Policy for the Integrated Management of Biodiversity and Its Ecosystem Services (PNGIBSE, Decree 1640 of 2012) that aims to promote the Integrated Management of the Conservation of Biodiversity and its Ecosystem Services so that the resilience of socio-ecological systems is maintained, on national, regional and local scales, taking into account scenarios of change and through the joint, coordinated and concerted action of the State, the productive sector, and civil society. The project is also consistent with the National Policy for the Integrated Management of Water Resources (PNGIRH, Decree 2372 of 2010), which aims to ensure the sustainability of water resources through their efficient and effective management and use, in a way that is coordinated with land use planning and the use and conservation that regulates the supply of water, considering water as a factor for economic development and social welfare and implemented through an equitable and inclusive participation process.

At the regional level, the project is compatible with the Magdalena Climate Change Plan, which develops the necessary actions at the departmental level that reduce greenhouse gas (GHG) emissions that are responsible for global warming, in accordance with the commitments Colombia acquired in its National Determined Contributions (NDCs) within the framework of the Paris Agreement. The Plan is divided into five lines of action: a) biodiversity, ecosystems, and ecosystem services; b) agriculture and fisheries; c) healthy and resilient urban and rural communities; d) climate-compatible tourism; e) and resilient infrastructure. These components are consistent with the proposed project activities and respond to the climatic and environmental needs of the region. In addition, the project will contribute to achieving the following objectives of the Departmental Climate Change Plan: a) the recovery of forests that serve as water regulators through PES (i.e., biodiversity, ecosystems and ecosystem services lines of action); b) the strengthening of the agroclimatic monitoring network and optimization of water resource use in agriculture (agricultural line of action); and c) the implementation of a strategy for education, training, and awareness that promotes actions that facilitate changes in the attitude and behavior of the population addressing changing climate conditions and enhancing the opportunities provided by climate change so that they contribute to the population's improved quality of life. The project also contributes to the fulfillment of the objectives of the POMCA of the Rio Piedras, Manzanares and others direct to the Caribbean.

Describe in what way the Accredited Entity(ies) is well placed to undertake the planned activities and what will be the implementation arrangements with the executing entity(ies) and implementing partners.

Governance and implementation agreements

Conservation International, through its CI-GCF Agency, will serve as the Accredited Entity (AE) for the Program. The CI-GCF Agency will be responsible for the overall oversight of this program, including technical, financial, and administrative monitoring and supervision (through reporting, audits, and annual site visits) and review and approval of the Executing Entity's (EEs) annual work plans and budgets. CI-GCF will also be responsible for providing support, guidance and backstopping to the EEs; ensuring compliance with GCF policies and FAA terms and conditions; monitoring of the achievement of Program results; reporting to the GCF; and Program closure and evaluation. CI-GCF will conduct these responsibilities, and disburse GCF funds to the EEs, in line with CI's Accreditation Master Agreement (AMA) with the GCF. Conservation International (CI-GCF) was the first international NGO to be recognized as a Green Climate Fund (GCF) Accredited Entity, with the capacity to implement GCF projects worldwide. CI has worked in Colombia since 1991 supporting communities in the development of sustainable, resilient, and environmentally friendly projects with a solid scientific and technological base; and strengthening the institutional development of non-governmental environmental initiatives, supporting their activities and serving as an international point of contact to channel efforts to benefit the achievement of the country's conservation objectives.

Executing Entity's (EEs). The execution of the project will be carried out jointly by three institutions, ProSierra, CI Colombia and a financial entity (*selection in progress*). ProSierra and CI will be responsible for the execution and administration of the Project, the management of the national sub-beneficiaries and their activities, reporting to the AE and ensuring the optimal alignment of the Government's policies and priorities to achieve the Project's outcomes and Fund-level results. at the Fund level. Since its creation in 1986, ProSierra has designed and executed more than one hundred research, conservation, and community development projects in the Sierra Nevada de Santa Marta, as well as Biodiversity Compensation projects in peripheral areas such as the Serranía de Perijá. ProSierra has received grants and funds from the Macarthur Foundation, the Gordon and Betty Moore Foundation, USAID, UNDP, The Nature Conservancy (TNC), and the World Bank, among other sponsors, to carry out conservation and sustainable development projects in the target area. Between 2000 and 2005, ProSierra received a \$ 5 million Loan from the World Bank for Innovative Learning executed in the San Lorenzo area, which is included within this project. ProSierra has also successfully completed Biodiversity offset projects for private companies as part of its portfolio

of environmental services in the Serranía del Perijá east of the Sierra Nevada de Santa Marta. More recently, ProSierra signed a 15-year, \$ 5.6 million contract with Drummond Ltd. to continue developing biodiversity offset projects in this area. ProSierra also has a network of local and national collaborating organizations (ReSelva, EcoHabitats, OPePA, Fundación Natura, Fundación Iguarayá) that can carry out specific work in areas outside our specialization as sub-beneficiaries. The project would also enhance local capacity building efforts and coordination with government institutions at the local and national levels. ProSierra staff will directly deliver several aspects of the project (e.g., strengthen multistakeholder water governance platforms; development and technical support of the implementation PAPs; and strengthening PAs, among others).

The national financial entity will be in charge of the implementation of a financial mechanism through which the following incentives proposed by the project will be managed: 1) a PES scheme, where public and private contributions will finance the conservation or rehabilitation of ecosystems that provide water regulation services in watersheds of the project; 2) a credit incentive to promote the access of small agricultural producers to climate-smart water use technologies, through which the volume of water saved is paid to a green credit that makes the project viable; and 3) the implementation of efficient water management and rainwater storage solutions in vulnerable rural communities. In the case of the PES scheme, the financial mechanism will efficiently channel the economic contributions of individuals and public and private entities interested in conserving and improving water-based ecosystem services and supporting climate-smart practices of water use by vulnerable small producers living in the supplying watersheds. Inspired by the experience of BanCO₂²³, the financial mechanism will be used to develop the concept of BankH₂O. The sources and flows of funding for the financial mechanism are shown in Figure 12.

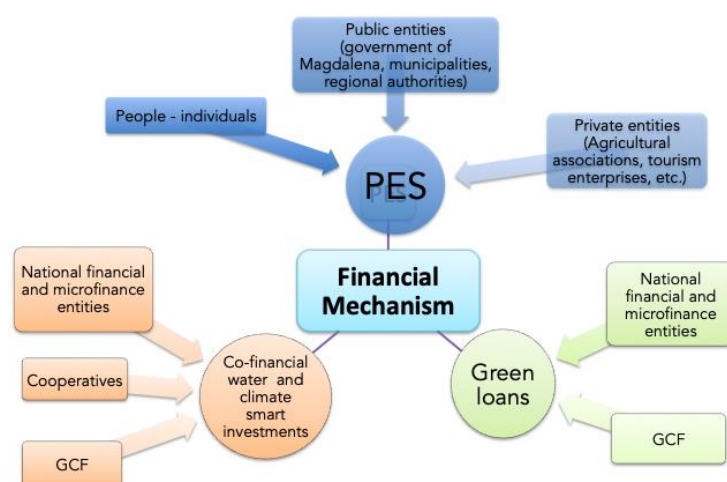


Figure 12: Sources and flows of funding for the financial mechanism.

In addition, the FM will have a financial administrator who will implement the payment instruments for beneficiaries, including simplified bank accounts for vulnerable rural producers for PES resources, and green credits for saving and efficient irrigation projects (saving and efficient water use strategies).

The sustainability of the FM and the interventions are based on the viability and integration of the investments of water users (municipalities, water utility companies, and the private sector) and effectively channeling them towards acknowledging water externalities and actions that contribute to greater water security and adaptation to climate change. According to Colombian Law, municipalities must make investments for the conservation of the watersheds supplying local water utilities. Article 111 of Law 99 of 1993 mandates that municipalities invest at least 1% of their current income in the purchase of properties or the PES schemes in the contributing watersheds. Deficiencies exist among the target area municipalities to implement both options; however, given that PES schemes offer incentives directly to farmers or landowners in exchange for managing their land to provide the ecological service (watershed protection through the conservation and restoration of strategic areas and ecosystems), the project will enhance their capacity to make use of this incentive. Currently, in the northwestern region of the SNSM, PES schemes have not been implemented due to capacity and operational barriers that prevent the implementation of an effective PES scheme with proven results. On the other hand, there is a willingness of the large-scale water users (e.g., banana and palm oil producers) located in the lower parts of the watersheds to contribute financial resources to their conservation, but there are no clear or effective mechanisms to make such contributions. Recently, as part of

²³ BancO2 is a private-public partnership which brings together companies, governments and rural, peasant and ethnic communities around the conservation of Colombia's natural ecosystems, through payments for environmental services for the promotion and protection of the environment (<https://banco2.com/>)

country's commitments to adapt to climate change within the framework of the Paris Agreement, the National Government issued Decree 1207 of 2018 that authorizes the inclusion of costs related to the protection of watersheds and water sources in the fees for water supply and sewerage services; however, in the region, public utilities companies do not have an effective mechanism for investments in the supplying watersheds. The project will create the mechanism to enable investments in watersheds supplying the water utilities of Santa Marta, Ciénaga, and Zona Bananera.

The financial mechanism will be supervised by the Santa Marta and Ciénaga Water Fund, which brings together both public and private entities and non-governmental organizations (NGOs) in the region, with ProSierra as the agency in charge of technically supporting investments, selecting, and providing assistance to vulnerable rural producers, and monitoring water benefits.

To ensure effective coordination and strategic alignment with partner institutions, a Project Steering Committee (PSC) will be created, which will be made up of the "Santa Marta y Ciénaga Water Fund" and the Ministry of the Environment and IDEAM who are members of the Collegiate Body for GCF. The Water Fund for Santa Marta and Ciénaga, an initiative that unites the efforts of the public, private and non-profit sectors, has the support of the Mayor's Office of Santa Marta, the Mayor's Office of Ciénaga, the Government of Magdalena, the CORPAMAG, Fundación Mario Santo Domingo, Santa Marta Vital, Tras la Perla de América, Fundación ProSierra, Grupo Prodeco, Red Ecolsierra and the Latin American Alliance of Water Funds - formed by the Inter-American Development Bank (IDB), Fundación Femsa, the Global Environment Facility (GEF), and TNC; in addition, the project will have a Technical Committee (TC) for the general technical direction of the project, which will be made up of the same institutions that make up the PSC. ProSierra will enter into inter-administrative agreements with these partners for the exchange of information and the generation of guidelines that ensure alignment with regional policies.

ProSierra will sign binding contracts, such as grant agreements or services agreements, with the implementing partners, including the agricultural private sector associations, academic and research institutions and other local institutions that will be beneficiaries of the GCF grantee in order to implement actions mainly directed to local communities (i.e., direct beneficiaries).

The organizational structure initially proposed for the operation of the project is presented below (Figure 13).

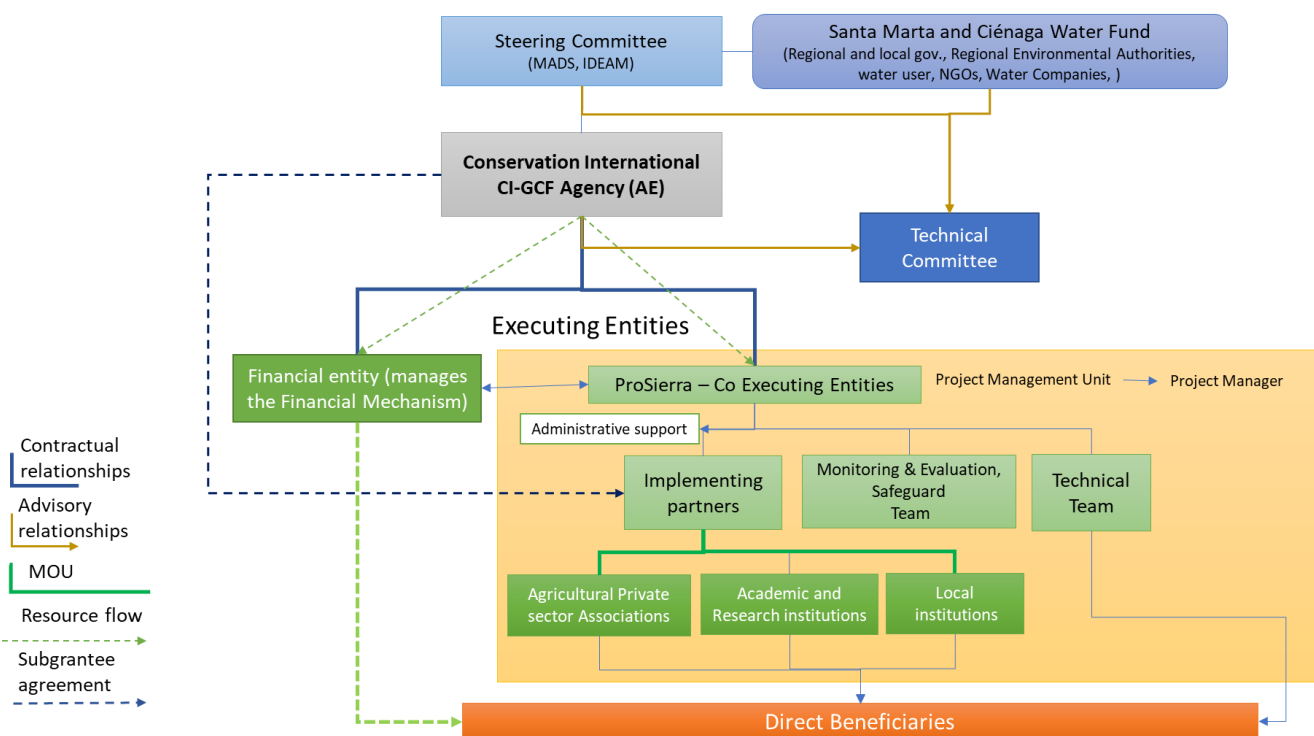


Figure 13. Project Organizational Structure.

Please provide a brief overview of the key financial and operational risks and any mitigation measures identified at this stage.

The preliminary categorization of the financial and operational risks associated with the project is moderate. With respect to operational risks, it is identified that the existing inter-institutional and inter-sectoral coordination and coordination is weak and unstable, due to institutional changes (policies and managers) in the project's partner entities (Government, municipalities, environmental authority, Water Fund). This risk arises considering that the project implementation horizon is longer than the administrative period of many of the officials and managers of the "partner" entities, and usually, these circumstances entail administrative and financial delays given the transition times in the administrations of the public entities. To address this risk, the project will implement a strategy of 'multilevel governance' (joint decision-making management between the public sector, the private sector, and civil society) as a new form or practice of government and social organization. Also, to contribute to effective coordination and strategic alignment with partner institutions, the project will create a Project Steering Committee (PSC) that will be responsible for providing strategic and operational recommendations for the achievement of results.

In the case of financial risks, institutional instability can result in uncertainty concerning co-financing resources, in particular from financial institutions. To manage these risks, institutional arrangements with these entities will be formalized via co-financing commitment letters from the project preparation phase and, periodically, joint activities will be carried out to report progress so that these results can be appropriated and reported by the institutions in their management reports associated with their planning and investment instruments. In this way, and based on the evidence of the project's success, it will be ensured that financial resources are made available in a timely manner. To avoid difficulties in project implementation, CI/ will develop an assessment of the financial capacity of the EE and provide specific technical assistance to improve their capacity based on the results of the assessments.

External project risks include (mitigation measures will be addressed during full proposal):

1. The existing inter-institutional and intersectoral coordination is weak and unstable.
2. The logistical, technical, and financial capacities of national, regional, and local stakeholders are not sufficient to ensure the long-term sustainability of the project's actions.
3. The influence of external agents in decision-making and control of the territory (i.e., armed groups and illegal activities) makes implementation of the proposed activities difficult.
4. Extreme natural events such as rains, torrential floods, landslides and mudslides, forest fires, and hurricanes, frequently affect different sectors of the seven watersheds where the project will be implemented.
5. Security risks: Despite the progress made in solidifying peace in the project area and elsewhere, conflicts and unsafe conditions continue to exist that may limit the achievement of the outcomes.

Risks related to project implementation.

1. The requirements for the construction and operation of the local rural water utilities (i.e., permits, administrative capacity, rules of development and operation, establishing rates), affect the communities' willingness to become involved.
2. The hydroclimatic monitoring stations that are financed do not generate information in a timely manner. Inadequate operation and maintenance by the community and ProSierra can affect the generation of information for comprehensive water management and the early warnings for climate risks.
3. The PES system as it is designed does not deliver the intended benefits for the recipients in a timely manner. The committed co-financing resources are not available in a timely manner (due to institutional changes or other factors), generating uncertainties and delays in the implementation of the PES system.

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

The GCF is directed to make a significant and ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change and promoting the paradigm shift towards low-emission and climate-resilient development pathways by limiting or reducing greenhouse gas emissions and adapting to the impacts of climate change.

Provide an estimate of the expected impacts aligned with the GCF investment criteria: impact potential, paradigm shift, sustainable development, needs of recipients, country ownership, and efficiency and effectiveness.

Potential impact.

The Project is expected to make a significant contribution to climate change adaptation by increasing water security and improving the resilience to climate change and livelihoods of the most vulnerable people and communities, and of forests and other ecosystems that are important for the provision of ecosystem services, in seven watersheds (Piedras, Manzanares, Gaira, Toribio, Córdoba, Frío and Sevilla rivers) with an area of 165,811 ha of which 15,415 ha will be conserved or restored by PES scheme. The total target number of direct and indirect beneficiaries resulting from project activities is 615,577 (50.4% women = 310,250) and 121,888 (50.4% women = 61,432),

respectively. Direct beneficiaries include 607,601 people from the urban centers of Santa Marta, Ciénaga, Zona Bananera, Pueblo Viejo, and other smaller urban areas and 7,976 people from rural agricultural areas. They will benefit from enhanced water governance under climate change (a decision support system for climate resilience and effective implementation in place), increased resilience through the conservation and restoration of ecosystems and water improved ecosystem services (13,150 ha conserved and 2,265 ha restored); and reduced water insecurity (607,601 urban people whose water utilities are supplied from watersheds with resilient environmental services; 1,422 families beneficiaries of PES payments, and 890 small producers of banana and oil palm), and improved livelihoods to the effects of climate variability and change (1,000 rural families).

Paradigm shift.

The northwestern region of the SNSM in northern Colombia is confronting water insecurity because of climate change, a situation worsened by inappropriate allocation of water resources; competing needs from urban, rural, and productive water users with high water demands; water shortages; land use practices that result in deforestation; damage to ecosystem services and the inefficient use of water; and loss of economic productivity and deteriorating livelihoods of urban and rural populations.

The paradigm shift resulting from this project is a sustainable approach to watershed management wherein ecosystems are conserved, ecosystem services are enhanced, and water security is provided for vulnerable urban and rural populations as well as local and regional economies. The project will reverse the existing problem of water scarcity by strengthening water governance through multi stakeholder decision-making that is climate-informed and enables fair access and water resource allocation, and which is focused on addressing the root causes of water insecurity and the low adaptive capacity of water users and institutions. Economic incentives and financial mechanisms for the conservation and improvement of ecosystem services and for adopting climate-smart technologies and production practices for efficient water use will serve as the basis for increasing water security that will lead to more productive and diversified livelihoods. This financial strategy will also maximize the GCF investment by mobilizing public and private financial sources to cover related costs of adaptation measures, and for securing long-term financing of the project outcomes. The project also contributes to GCF's objective of promoting a paradigm shift of countries to climate-resilient development, considering the needs of those who are most vulnerable to climate change impacts.

Sustainable development.

The project is designed to develop and implement climate change adaptation measures that will be sustainable. The project has prioritized the poorest communities that inhabit the seven watersheds of the northwestern region of the SNSM; as such, there will be multiple opportunities for the implementation of actions that contribute to the development and improve the livelihoods of these communities, including women, who are directly dependent on the water sources and ecosystem services that the project will help to maintain. Specifically, the actions will be focused on small farmers who depend on their crops to generate income for their livelihoods and those of their families.

In particular, actions to generate greater resilience and improved livelihoods for the people and communities most vulnerable to the effects of climate change, including the adoption of complementary nature-based economic activities and the strengthening of market-based agri-food value chains in climate change scenarios, and resulting in sustainable and diversified agricultural production, will generate co-benefits such as more stable and resilient incomes, increased food security and reduced gender gaps.

The implementation of water PES schemes can generate monetary and non-monetary benefits for those who preserve the ecosystems that regulate water systems, including more stable water availability in times of drought. Actions for increased ecosystem resilience and ecosystem services will generate environmental co-benefits such as conservation of native species and fauna and flora, soil conservation and erosion reduction, and improved water quality through reduced sedimentation. Actions to strengthen adaptive capacity and reduce exposure to climate risks will also contribute to sustainable development and will include as co-benefits the strengthening of institutional and community organizational processes and the reduction of conflicts associated with access to and use of water resources.

The project will also contribute to achieving the Sustainable Development Goals in Colombia, including: Goal 1: No poverty; Goal 2: Zero hunger; Goal 5: Gender equality; Goal 10: Reduced inequalities; Goal 12: Responsible consumption and production; Goal 13: Climate action; and Goal 15: Life on land. Finally, the project will contribute to improving carbon stocks through restoration and alternative climate-smart production practices such as agroforestry and shaded coffee. In addition, the nationally appropriate mitigation actions (NAMA) for coffee in

Colombia indicate that the wet processing represents close to 49% of the GHG emissions of the carbon footprint of the product.²⁴_{CFP}²⁵_{SEP}

Recipients' needs.

The country's climate change strategies and the priority measures of the agricultural and fishing line of action of the PIGCTM (goals 7, 8, 9 and 10) indicate the importance of developing climate change management at the territorial and sectoral levels, including water security.²⁵ This project will help the environmental authorities (CORPAMAG and DADSA) generate better tools for planning and managing water resources in the face of climate change scenarios. It will also help the productive sectors (e.g., banana, coffee, and palm oil), rural communities and the most vulnerable urban population in the municipalities of Santa Marta, Ciénaga and Zona Bananera to be better adapted to face more frequent and prolonged drought events and greater variability in precipitation that affect water and food security. The project will also contribute towards maintaining the integrity and restoration of the natural vegetation cover that are essential for water regulation and will also bring as a co-benefit a greater resilience of biodiversity species by improving ecological connectivity. Finally, it responds to the needs of the local population and institutions that were expressed during the different consultation events carried out at the local level during the end of 2020 and early 2021; during these events, the need to improve their capacity to respond to climatic change was manifested. For example, 52% of those surveyed express their desire to diversify their productive activity including conservation activities; while 29% consider water storage and 15% soil improvement to be among the main issues to be addressed to build resilient agricultural production systems to face climate change.

Country ownership.

The project has been conceived by ProSierra in conjunction with the Water Fund and the regional environmental authority (CORPAMAG) whose functions include planning, administration, control and sustainable management of natural resources, and project management for environmental sustainability and risk prevention and was selected in the framework of the NAP readiness Program, currently financed by GCF, among more than 100 projects. In this framework, the project was included in the national portfolio for GCF.

In addition, the IDEAM data has been consulted regarding climate information and risk analysis, as it is the entity in charge of supporting the hydro-meteorological network in the seven river basins and of coordinating alerts related to climate events at the national level. The proposal is aligned with the PNACC, the PNCC, and Law 1931 of 2018, which regulates the operation of the National Climate Change System; this regulation defines the governance structure and functions at all levels of the State related to climate change, articulates disaster risk management with climate change adaptation actions, and defines the planning instruments for climate change management at the territorial and sectoral levels, among others. At the regional level, the project is aligned with the Integrated Climate Change Management Plan for the Department of Magdalena 2040, whose objectives include improving the capacity to adapt to the increase in average temperature and variation in precipitation because of climate change.

Efficiency and effectiveness.

Estimated cost per project beneficiary = USD 27.0 M / 615,577 people = USD 43.86 per beneficiary. This is comparable to other projects approved by the GCF.

The extent of ecosystems to be restored and conserved are 2,265 ha and 13,150 ha, respectively.

The GCF grant will enable the development of a financial strategy that will allow catalyzing earmark national, subnational, and local financial sources to cover the costs of adaptation measures, both from public and private entities. The Project will customize green loans to small vulnerable producers as part of the actions for adaptation to climate change through the saving and efficient use of water loans, which will be provided by private and public banks. The mobilization of these sources will be triggered by GCF grants that will overcome climate change capacity or networking barriers or incorporate climate change adaptation externalities through innovative financial instruments.

GCF funding will also allow the development of PES program for the conservation and restoration of natural vegetation covers (e.g., humid forests and riparian forest) that provide water ecosystem service, which will be co-financed with public (e.g., municipalities and CORPAMAG) and private (oil palm, coffee and banana sectors and water supply enterprises) funds and operated through a financial mechanism created by the project.

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

²⁴National Coffee Research Center (CENICAFE), personal communication.

²⁵ National Climate Change Adaptation Plan (PNACC), 2012; National Climate Change Policy (PNCC), 2014.

Please describe how engagement among the NDA, AE and/or other relevant stakeholders in the country has taken place and what further engagement will be undertaken as the concept is developed into a funding proposal.

The project was included in the national portfolio for GCF for being one of the projects selected to be structured as Funding Proposal for the NAP readiness that is currently implemented. Furthermore, this selection was performed by the directives of the Program, including DNP as the NDA, which based this selection on the alignment with the national adaptation priorities.

For the design of the project, a stakeholder involvement strategy has been implemented that contains a series of flexible mechanisms and tools for social involvement that ensure sufficient meeting opportunities, in virtual and face-to-face environments, differentiated by type of stakeholders: public (MADS, DNP, Governor's Office of Magdalena, Municipalities, environmental authorities), private (producer associations and unions) and civil society (academia, NGOs, community leaders, women's and ethnic groups, among others), environmental authorities), that have allowed the effective and continuous exchange of ideas, the establishment of agreements and commitments regarding water supply, management for the conservation of biodiversity and its ecosystem services.

During what follows of project design, stakeholder involvement will be achieved differentially and according to the levels of either the direct or indirect influence of each stakeholder group. Public stakeholders with direct influence will participate in the project through formal institutional arrangements such as cooperation agreements, memoranda of understanding, and co-financing mechanisms. The participation of community-level stakeholders directly related to the management of the watersheds will be achieved through conservation agreements, ecosystem restoration activities, and support for the implementation of climate-smart and sustainable production activities. Social stakeholders with direct influence will be involved through information, communication, and education activities related to climate change adaptation and the comprehensive management and conservation of biodiversity and ecosystem services. With the water supply sector for domestic, industrial, and agricultural use, joint actions will be developed to integrate the issues of comprehensive management of water resources under the principles of adaptation to climate change and business processes with a socio-ecological focus. This strategy applies to the development of the concept note and the full proposal.

Both MADS and DNP, in addition to being part of the technical/supervisory committee of the project, have been invited to the different meetings, which include virtual workshops, focus groups, and face-to-face exchanges, during which the different deliverables related to the project development process have been validated and received feedback, and the focus of the project is agreed and decided.

Currently, the letters of intent ratifying their commitment to the project have been requested of the Magdalena Government, the Santa Marta District, the municipality of Ciénaga, CORPAMAG, the coffee growers committee, CENICAFE, AGROSAVIA, and CENIPALMA, among other relevant stakeholders.

For its part, CI (AE) has provided technical support through its Headquarters Office and its Office in Colombia for the development of this concept note through meetings and review of various versions; this support will continue during the development of the full proposal.

The participation strategy for the project design has followed the national standards that are defined for managing the COVID-19 pandemic. During the first months of this process, only virtual meetings and workshops were held; public and private entities with good internet access and that are based in the urban areas of the project municipalities and Bogotá were able to participate in the meetings. In addition, when allowable, in-person activities that were planned as part of the participation strategy were held to facilitate the participation of rural communities in the project target area, as there is no internet coverage outside the urban centers. A survey was conducted aimed at identifying the main problems related to climate change and water availability, as well as the socio-economic and institutional context in the seven basins of the project. This survey allowed to identify priorities for action in rural communities; Likewise, a field visit was carried out including trips to the seven basins, focus groups with small producers (coffee, plantain, others), and ethnic communities, public entities (Government of Magdalena, District of Santa Marta, Corpamag, etc.); private institutions (Irrigation districts); research entities (Cenipalma, Ideam), from which information on opportunities for action in the region can be found both from the perception of the actors, as well as information and documented data. During the in-situ activities, biosecurity measures were used, and the activities were carried out in open-air spaces; no cases of infections were reported as a result of these activities.

7. Indicative Financing/Cost Information (max. 3 pages)

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

Please provide an estimate of the total cost per component/output and disaggregate by source of financing.

Component/ Output	Indicative cost (Million USD)	GCF financing		Co-financing		
		Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
1. Increased resilience of ecosystems and water ecosystem services.						
1.1. Incentives implemented for the conservation and improvement of ecosystem services under climate change scenarios	23.0	15.2	Grant	4.7	Grant	Public Entities (Government of Magdalena municipalities, environmental authorities)
				3.1		Producers Associations
2. Increased resilience and improved livelihoods of people and communities in regions most vulnerable to the effects of climate variability and change.						
2.1. Incentives implemented for adaptation to climate change through the saving and efficient use of water	19.7	5.6	Grant	0.7	Loans	Producers Associations
				13.4		Financial Entities
2.2. Technologies and good practices for efficient water use implemented for adaptation to climate variability and change	2.1	1.5	Grant	0.6	Grant	Public Entities (Government of Magdalena municipalities, environmental authorities)
2.3. More resilient livelihoods and generating positive water externalities	3.7	3.0		0.7		
3. Institutional support system to reduce vulnerability to climate variability and change.						
3.1. Strengthened hydro-climatic information network for adaptation to climate variability and change	1.3	1.0			Grant	0.3
3.2. Territorial, sectoral, and environmental planning instruments integrating climate variability and change considerations at the basin scale.	0.4	0.3				0.3
3.3. Institutions strengthened for water management in scenarios of climate variability and change	0.3	0.2				0.3
Indicative total cost (USD)	50.5	26.8		23.7		

For private sector proposal, provide an overview (diagram) of the proposed financing structure.

N/A

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

Explain why the Project/ Programme requires GCF funding, i.e., explaining why this is not financed by the public and/ or private sector(s) of the country.

Although the Colombian economy is classified by the World Bank as upper middle income, it presents large regional differences. The national average GDP per capita in 2019 was USD\$6,510. In the department of Magdalena where the project is located, it is below average with a GDP per capita of 64% of the national average; the department of Magdalena has a small GDP and low per capita income compared to the national average. In addition, according to the unmet basic needs index for rural populations, the department of Magdalena is ranked 11th among the country's 32 departments. Colombia is one of the countries with the highest income inequality and labor market informality in Latin America²⁶. The COVID-19 pandemic and the responses to which the different countries have been forced to contain and control it have provoked the largest and most generalized macroeconomic shock that the world economy has experienced in recent decades. In Colombia, COVID 19 caused the worst recession in almost 50 years in 2020. To face this shock, public spending needs were increased both to address the direct effects of the pandemic, especially related to the strengthening of health systems, and to cushion the effects of confinement on the most vulnerable households and companies most affected by liquidity constraints. In the short term, Colombia will increase the fiscal deficit and the government's net debt to address these priorities while the shock remains, and in the medium and long term the government will seek policy alternatives to restore the fiscal balance through a combination of a structural increase in current revenues and a prioritization of expenditures. Under this scenario, the public resources available for financing adaptation projects will be restricted and there will be no fiscal space to take on loans with sovereign guarantees. Likewise, scarce public and private resources will be prioritized to finance actions to boost economic growth, support the full and rapid reestablishment of the business fabric, and counteract the excessive adjustments in risk aversion that naturally characterize private agents in situations such as the current one.

Now more than ever, institutional cooperation models and blended financial instruments are needed to support economic and social recovery adapted to climate change, such as those proposed in the project. The resources requested from the GCF will guide and catalyze national and subnational public and private resources to effectively drive economic growth with climate change adaptation.

The overall financial strategy of the Project is to mobilize earmarked national, subnational, and local financial sources to cover the costs of adaptation measures, both from public and private entities. For adaptation measures related with productive activities, under Output 3.1 the Project will customize green loans to small vulnerable producers as part of the actions for adaptation to climate change through the saving and efficient use of water. The mobilization of these sources will be triggered by GCF grants that will overcome climate change capacity or networking barriers or incorporate climate change adaptation externalities through innovative financial instruments. Although these financial instruments are dedicated to small vulnerable producers or landholders, it is anticipated to have a demonstrative effect that has the potential to expand to medium and large producers. In addition, since the project targets the most vulnerable population/water users that are also the poorest, the support for a paradigm shift among this population needs to be supported by a grant as they do not have the resources to do it themselves.

The following table shows the specific financial strategy for each output of the project.

Component/Outputs	Specific Strategy
1. Increased resilience of ecosystems and water ecosystem services.	
1.1. Incentives implemented for the conservation and improvement of ecosystem services under climate change scenarios	Public and private entities (departmental government, municipalities, and the palm oil and banana productive sectors) will pay for water regulation ecosystem services; an area in which their extensive experience in the country is regulated. GCF will finance the institutional setup for operationalizing the payments, and initial payments for maintaining or improving environmental services in areas with high vulnerability to climate change.
2. Increased resilience and improved livelihoods of people and communities in regions most vulnerable to the effects of climate variability and change.	
2.1. Incentives implemented for adaptation to climate change through the saving and efficient use of water	Financial and producer's association entities will offer loans to small producers for investments that increase efficiency of water use, through existing green loans. GCF funds will finance an incentive through the financial mechanism directed to the beneficiaries of the loans (i.e., payments for water savings) that value the adaptation to climate change externality in the loans, in order to improve its viability for the small producers. In the long term, it is expected that this type of incentive could be financed through the water use charge.
2.2. Technologies and good practices for efficient water use implemented for adaptation to climate variability and change	GCF funds will be used to supply equipment (i.e., rainwater collectors) to households to adapt to climate change, while public entities will cover the cost of the improvements in efficiency of traditional water distribution

	systems. A sustainability and maintenance plan for this equipment will be developed for the full Funding Proposal.
2.3. More resilient livelihoods and generating positive water externalities	GCF funds will cover part of the costs of climate change capacity building activities for community based resilient livelihoods. Public entities will cover the remaining costs.
3. Institutional support system to reduce vulnerability to climate variability and change.	
3.1. Strengthened hydro-climatic information network for adaptation to climate variability and change	GCF funds will cover the additional cost of the information infrastructure to include climate change forecasts and early warnings to local information networks. IDEAM co-finance will cover the costs of integrating and operating the network.
3.2. Territorial, sectoral, and environmental planning instruments integrating climate variability and change considerations at the basin scale.	GCF funds will cover capacity building activities to include climate change to territorial and sectoral planning. Public and private entities will cover costs of the overall planning process
3.3. Institutions strengthened for water management in scenarios of climate variability and change	GCF funds will cover part of the costs of climate change capacity building activities to strengthen institutions. Public entities will cover the remaining costs.

Describe alternative funding options for the same activities being proposed in the Concept Note, including an analysis of the barriers for the potential beneficiaries to access to finance and the constraints of public and private sources of funding.

The activities aimed at strengthening climate information and improving early warning systems and climate change forecasts under Output 1.1, although partially financed by public entities, unions, and private companies, do not cover climate change modeling, and are concentrated in geographic areas and types of stations of exclusive interest for each of the entities. This leads to the current situation of dispersion of information and areas not covered with climate stations that are necessary for a total modeling of the region and to obtain sufficient information for long-term modeling. The activities to improve water efficiency are designed to be financed by the national financial sector under Output 3.1. However, given that the economic benefit of adapting to climate change is not internalized, many investments in water efficiency do not reach the level of profitability to be made viable by the current instruments, especially among small producers, who are also uncertain about the improvements in productivity from better water use. The project will provide technical assistance on the selection, design, and operation of the productive systems and will provide support to the producers in preparing the credit applications, which will contribute to overcome the barrier regarding access to credit.

National regulations create obligations for territorial entities (departments and municipalities) to invest in land purchase or payment for environmental services in the watersheds supplying their water utilities. However, the Magdalena Department and the municipalities in the project area do not have the institutional arrangements and technical capacity to design such programs, nor do they have the capacity to incorporate climate change considerations into the provision of these ecosystem services. Therefore, additional resources are needed to overcome these barriers, as the ones addressed in activities in output 2.1; also, the project will facilitate the use private contributions and the information and monitoring system will ensure transparency in the use of these resources.

The request for financial resources from the Green Climate Fund is also justified by the fact that funding will improve the quality of life and well-being of the rural and urban populations that are vulnerable to climate change, who are poor, and present an Unsatisfied Basic Needs (UBN) index score of 35.86% and 20.67%, and a Multidimensional Poverty Index (MPI) of 30% and 37.63%, respectively for the municipalities of the project area.

Finally, although there are several programs of public entities aimed at supporting the improvement of the livelihoods of vulnerable rural producers (Output 3.3), few of them offer alternatives adapted to future climate scenarios; this is due to the fact that they are generally designed at the national or departmental level with priority objectives of overcoming poverty and short term impact, and/or because the offering entities lack the capacity to carry out this type of specific design. The added value of the GCF investment would be to provide technical assistance that would allow a transition to climate-smart production practices.

Justify the rationale and level of concessionality of the GCF financial instrument(s) as well as how this will be passed on to the end-users and beneficiaries. Justify why this is the minimum required to make the investment viable and most efficient considering the incremental cost or risk premium of the Project/ Programme (refer to Decisions B.12/17; B.10/03; and B.09/04 for more details). The justification for grants and reimbursable grants is mandatory.

The financial design of the project incorporates grant resources from the GCF that catalyze resources from national and local public entities (i.e., Ministry of Environment, Department of Magdalena, and municipalities) and trade associations (i.e., oil palm, banana), and credit resources from the national financial sector (i.e., commercial banks). Donation resources from national and local public entities cover the provision of public goods (information, research, capacity building and institutional strengthening) and payment for environmental services in accordance with the legal requirements and budgetary capacities of these entities. The grant resources requested from the GCF are the minimum required so that resources from national and local sources are efficiently directed to the region's adaptation to climate variability and change. Likewise, GCF resources cover only the incremental costs of climate change on public goods and incentives for payment for environmental services. The grant resources will be transferred by CI to ProSierra (EE), which in turn will transfer funds to other organizations through binding agreements such as grant agreements or services agreements or similar agreements and according to specific needs for the implementation of project activities. Incremental PES resources for climate change adaptation from the GCF will be transferred to the most vulnerable rural smallholders.

Likewise, a portion of the grant resources requested from the GCF will enable investments in water efficiency improvements by small producers, which will be covered with resources from national banks through green loans. The GCF resources will pay for the adaptive water saving benefits of such investments and will be transferred as capital credits to the debts of small producers. Thanks to the GCF investment that will be used to reduce the new debts of small producers through the incentive proposed by the project, it will be possible to catalyze improvements of water irrigation systems that otherwise will remain inefficient, and both the watershed and the small producer will be more vulnerable to climate change. The amount of GCF funds for the payments are valuing the water savings, and the small producer will pay for the remaining cost of the loan. The project will establish agreements with financial institutions for specialized assistance in structuring quality projects for financing through green and climate loans aimed at promoting the efficient use of water resources.

In the case of private sector proposal, concessional terms should be minimized and justified as per the Guiding principles applicable to the private sector operations (Decision B.05/07).

N/A

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

Please explain how the project/programme sustainability will be ensured in the long run and how this will be monitored, after the project/programme is implemented with support from the GCF and other sources.

The sustainability of the project depends on improving the governance of institutions and vulnerable rural and urban communities for management of water resources and institutionalization of mechanisms for sustainable climate finance. At the institutional level, the sustainability of water governance will be based on incorporating the climate dimension into territorial planning and management through the identification of the ecological networks (EEP, as per the Spanish acronym, and defined by IDEAM as "the set of strategic ecosystems that guarantee the integrity of biodiversity and the provision of ecosystem services in order to meet the basic needs of the population"). The definition and incorporation of the EEP into planning instruments (e.g., land use plans [POTs] and watershed management plans [POMCAs] using an adaptive approach to climate change serves as a basis for the sustainability of investments. The project will seek not only to identify the EEP, but also to integrate it into participatory processes and environmental education through awareness-raising activities, workshops, meetings, and ecological guided tours and interpretive hikes, focusing on developing the knowledge and understanding of the importance of the EEP for risk management and for climate change adaptation, which will remain after project completion.

At the local level, the sustainability of water governance will be achieved through strengthening associative capacity for the operation of rural water utilities that are resilient to climate variability and change, which are operated by local communities through the Community Action Councils. The operation of the rural water utilities will include the definition of the organizational and tariff systems, the latter that will be the basis for their sustainability including their maintenance and operation costs. Additionally, the sustainability of water governance will be achieved by strengthening an institutional and social structure that allows for effective coordination, collaboration, vertical and horizontal integration between the different responsible stakeholders, in a differential but integral manner, for water resource management, providing them with timely and relevant information in the face of climate change scenarios and building ownership as the operation and maintenance of the rural water utilities will be 100% community-based; this institutional and social structure will remain in place beyond the life of the project. At the local level, institutional and social structures will be based on developing a non-profit community-based structure grounded on citizen participation, accountability, and ownership for the provision of water-related services through rural water utilities.

At the farm level, the sustainability of the project is based on the social appropriation of technological alternatives and the adoption of diversification models that are less demanding of water resources, which reduce their vulnerability and increase their income, generating capacities to make decisions in the context of climate variability and change. Sustainability will be achieved through the access of small rural producers to water-saving and efficient water use technologies in production and post-harvest processes, together with the generation of a culture of

investment sustainability, as it implies the implementation of systems to monitor the effectiveness and efficiency of access to improved systems through participatory follow-up processes. In the short term, producers will benefit from incentives for adopting climate-smart technologies. The proposed technological options are supported by research from the production unions that demonstrate significant reductions in water use and return on investment. Additionally, they may also reduce their obligations related to service taxes when they adopt technological options for the use of wastewater. In the case of producers with service of irrigation districts, they will be able to reduce consumption costs and benefit from adapted technologies that will allow them to better cope during drought periods and avoid water rationing.

The sustainability of the project is also based on several financial mechanisms including the design and implementation of a water PES program that channels both public and private resources from water users in the seven project watersheds. The Governor's Office of Magdalena and the municipalities of Santa Marta and Ciénaga, included within their development plans for the 2020-2023 administrations the design of PES programs. To make these programs effective the project will strengthen the mechanism for the articulation of PES efforts and will develop common methodologies for the identification of priority areas and articulate efforts for public and private actors to efficiently implement PES for the provision of water services required for adaptation under climate variability and change scenarios. In addition, the program will also incorporate financing companies, organizations and individuals interested in the care of the region's water supply basins, such as agricultural production associations, hotels, and industries in the region. The PES schemes will include direct payments by public entities (e.g., municipal water utility operators such as ESSMAR) to landowners who carry out actions to preserve and better manage water resources and associated natural vegetation cover.

The financial mechanisms will also include support for small farmers to access low-cost, long-term green loans to improve their water use systems in terms of catchment, distribution, and irrigation. To this end, financial institutions (e.g., Finagro and Banco Agrario) that have a track record with this type of loans and are present in the seven priority watersheds of the project. An incentive associated with water savings will also be implemented for producers who increase water availability in the watersheds by improving their irrigation systems. The improvement will cover the catchment and conduction components, in addition to the irrigation component, reducing costs and water demand contributing to its sustainability. The incentive will consist of a capital payment one year after it is granted, after verification of the operation and functioning of the improved system. The value of the incentive will depend on the irrigated area, the irrigation system to be improved and the improved irrigation system. This incentive will include a complementary technical assistance service on irrigation issues for palm and banana crops, for which agreements will be established with the main regional associations (ASBAMA and Fedepalma) to develop these activities through their rural extension systems.

For non-grant instruments, explain how the capital invested will be repaid and over what duration of time.

N/A

i. Supporting documents submitted (OPTIONAL)

- Map indicating the location of the project/programme.
- Diagram of the theory of change
- Economic and financial model with key assumptions and potential stressed scenarios
- Pre-feasibility study
- Evaluation report of previous project
- Results of environmental and social risk screening FN

Self-awareness check boxes

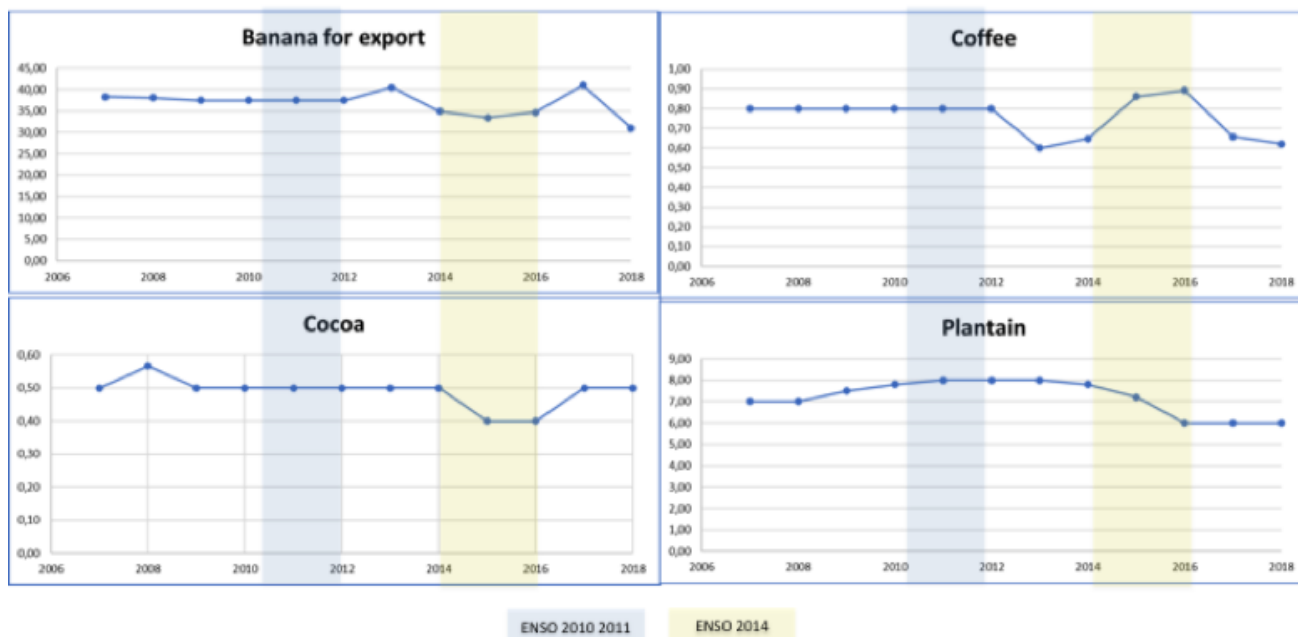
- Are you aware that the full Funding Proposal and Annexes will require these documents? Yes x No
-
- Feasibility Study
 - Environmental and social impact assessment or environmental and social management framework

- 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 1: Change in the production of crops over the last 14 years.

Main crops Yields (Tn / Ha) 2007 – 2018 in Santa Marta municipality

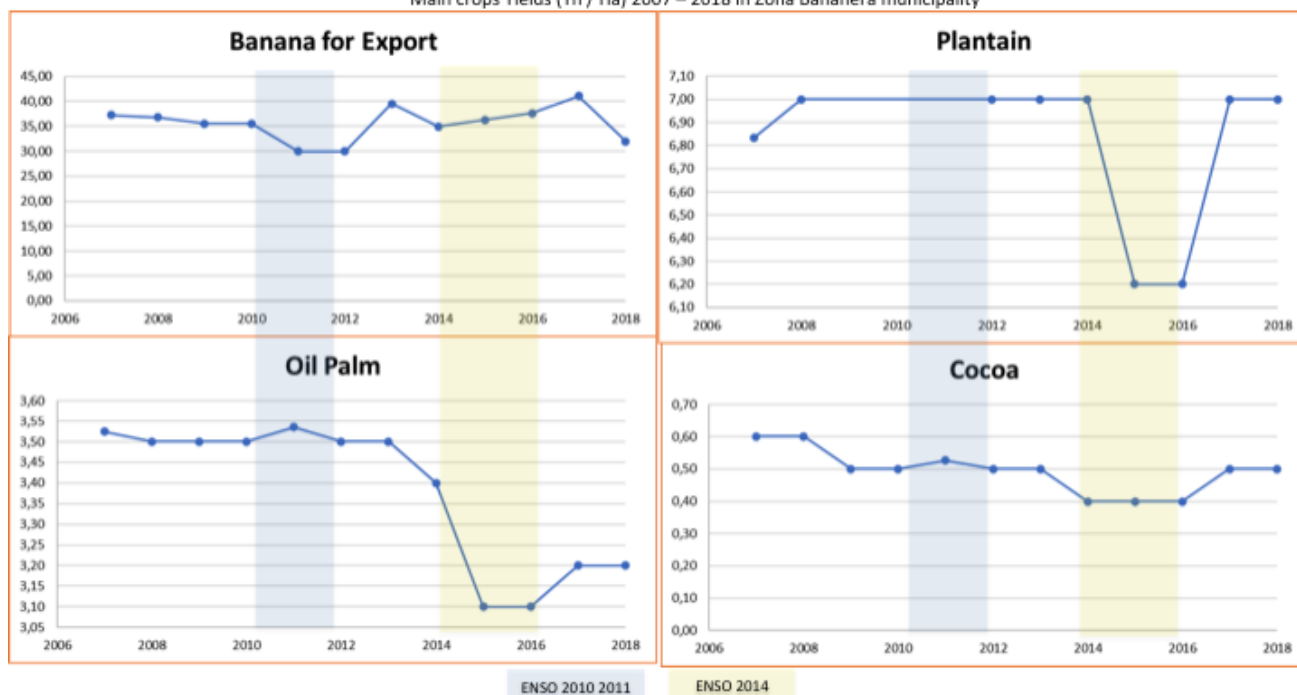


Main crops Yields (Tn / Ha) 2007 – 2018 in Cienaga municipality





Main crops Yields (Tn / Ha) 2007 – 2018 in Zona Bananera municipality



Annex 2. Theory of change

