

RISCALES REDD PROJECT



Document Prepared by ICCO – Fondo Acción

Contact Information

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1 PROJECT DETAILS

1.1 Summary Description of the Project

This project is an Agriculture, Forestry and Other Land Use (AFOLU) project under the Reducing Emissions from Deforestation and Degradation (REDD) project category. Specifically, the project is of the “Avoided Unplanned Deforestation & Degradation” (AUDD) project category.

The annual average of reduced emissions is 99,985 ton/CO₂ Eq. For the current monitoring period, an estimated 435,697 tons/CO₂ have been reduced, with an annual average of 60,606 tons/CO₂ and a total of 383,413 VCUs for the verification period 2014-2020. The project is estimated to generate approximately 2,7 million VCUs over 30 years.

The project area is located in the collective territory of Los Riscales in the Pacific coast in the department of Chocó. Belonging to the biologically diverse Chocó-Darién bioregion, forests in the project area are important nationally and internationally for the ecosystem and biodiversity services they provide. Forests in the project area, however, have experienced a continued reduction in biomass due largely to illegal logging and to the establishment of crops, use of firewood, pastures, and settlements. These forests have historically been an important source of income for local families, who periodically harvest timber when the economic needs arise, or to generate income generation sources.

Changes to Colombian Constitutional Law in 1991 resulted in the recognition of the ancestral presence and possession of lands by communities of Afro descent holding ethnic traditions and cultural identity. Subsequent legislation, through Law 70 of 1991, as detailed in Section 1.3.5, granted land title and administrative autonomy to these communities. Law 70 also gave these communities the rights of ownership of forests, and the rights of use of other natural resources present in their territories, though subject to the general legal dispositions of Colombia.

Agriculture, cattle ranching, and clearing for tourist infrastructure and related services are the main deforestation drivers, in addition to fuelwood and illegal timber extraction. Continual timber extraction eases the transition of forests to agriculture and pastureland use. The project aims to alleviate these pressures on the forests through the support of governance capacity (including individual property titling, land-use planning, and conservation zone demarcation), the generation of alternative economic activities and income sources, and through capacity building in administration and

management. These project activities, beyond protecting local forests and biodiversity, contribute to social and economic development in one of the poorest areas of Colombia. The effectiveness of these activities is partially dependent on their long-term economic success and wide-spread adoption.

Since the project's inception, local communities have been actively participating in the project's formulation and implementation. The early involvement of participating communities has created awareness among community members and readiness for project implementation. Community support has culminated in the project's endorsement by the legal representatives of communities and the communities' General Assembly. These endorsements demonstrate the communities' long-term commitment to emissions reductions from avoided logging and deforestation.

<u>Audit Type</u>	<u>Period</u>	<u>Program</u>	<u>VVB Name</u>	<u>Number of years</u>
<u>Validation/ Verification</u>	<u>(01-April-2014--31-December-2020)</u>	<u>VCS</u>	<u>AENOR</u>	6,42
<u>Total</u>				6,42

1.2 Sectoral Scope and Project Type

Sectoral scope 14 – Agriculture, Forestry and Other Land Use

AFOLU project category: Reduced Emissions from Deforestation and Degradation (REDD+)

Activity type: Avoiding Unplanned Deforestation.

Project activity type was defined according to a decision tree located in the methodology used (REDD-MF, see section 2).

Project is individual, not grouped.

1.3 Project Eligibility

The Project is eligible under the scope of the VCS program, taking into account the following:

- Considering the guidelines for the selected methodology (VM0007) the project activities are aimed at reducing Green House Gas (GHG) emissions (CO₂) from unplanned deforestation as they are compared with the absence of the project (baseline).

- The project area meets the definition of forest presented by Colombia to the UNFCCC for the purposes of the National REDD+ Strategy (ENREDD+) and specifically for the construction of the FREL and was covered by forest for a period of 10 years before the project start date; it can be evidenced by Land Use and Land Change (LULC) analysis.
- The type of project activity within the AFOLU categories eligible under the VCS program is to reduce emissions from forest degradation and avoid deforestation (REDD category), in accordance with the provisions of sections 3.2.1 and A1.5 of the VCS Standard, v4.4 document.
- In the absence of the project, the deforestation process will continue. Identified drivers for deforestation projects, in order of importance, are presented as follows:
 - Conversion of forestland to cropland for subsistence farming.
 - Conversion of forest land to pastures
 - Conversion of forest land to settlements
 - Logging of timber for commercial sale
 - Logging of timber for charcoal and firewood

For the determination of the drivers of deforestation and degradation, see Section 3.4.1.2.

- The VCS Standard, v4.4, in Section 3.2.9, indicates that when REDD project activities occur in wetlands, the project shall comply with the requirements of the respective project category and the requirements of the WRC, unless the expected emissions from the soil organic carbon pool or the change in the soil organic carbon pool under the project scenario are considered to be below the minimum level or can be conservatively excluded as set out in the VCS Program document VCS Methodology Requirements, in which case the project shall not be subject to the requirements of the WRC.

According to section A1.13, Common wetland types include peatland, salt marsh, tidal freshwater marsh, mangroves, wet floodplain forests; however, soil organic carbon pools in both the reference and project scenarios have been conservatively excluded. This is explained by the fact that more than 60% of the mangrove areas that are deforested remain as water bodies, and other coverages that do not immediately affect the sinkhole. On the other hand, following IPCC methodological recommendations, it determines that Tier 1 default assumption is that soil CO₂ emissions and removals are zero (EF=0) for forest management practices in mangroves. 4.2.1.3 Soil Carbon (IPCC 2013. Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands)

1.4 Project Design

The REDD+ Project Los Riscales has been designed to include a single location or installation only. Los Riscales REDD+ project includes a single location because the project area corresponds to the collective territory of the Los Riscales community council, which constitutes a single spatial unit.

Eligibility Criteria

N/A. No group projects.

1.5 Project Proponent

Organization name	Consejo Comunitario General Los Riscales
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1.6 Other Entities Involved in the Project

Organization name	Interchurch Cooperative for Development Cooperation (ICCO)
Role in the project	Promoter and co-financer of the Project Developer PDD V 1.0 and V 2.0
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Organization name	Fondo Acción
Role in the project	Developer Joint Project Description & Monitoring Report. V.01
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Since 2007, Patrimonio Natural has worked with the Community Council of Riscales in the implementation of different projects such as, Mosaics of Conservation which supported the organizational strengthening and the process of territorial regulation of the Community Council through the generation of productive alternatives and the definition of specific areas of conservation; The Conservation Landscape Project that supported the declaration of the DRMI; and the Conservation Incentives Project for Land Management and Mitigation of Socio-Environmental Conflicts in which allowed the identification and prioritization of environmental services in the area, main problems associated and possible solutions. In this way, technological alternatives for cooking activities and regenerative actions of timber forest species have been adopted, which allows the preservation of forest and mangrove areas. Patrimonio's project confirms that the Los Riscales Major Community Council has the capacity to develop and implement conservation projects that involve participatory processes and sustainable economic alternatives. For this reason, the Community Council turns out to be an adequate implementer of the REDD+ Project ensuring the mitigation of possible associated risks.

Subsequently, an agreement between the Interchurch Cooperative for Development Cooperation-ICCO and Patrimonio Natural for biodiversity and protected areas, was used to finance a study of the viability of a REDD project in the Los Riscales collective territory. As a result of this alliance with ICCO, in November 2015 the opportunity was identified to present the project proposal "Forests & Climate Change: Consolidation of territorial rights of the FOS - Swedish-Norwegian Cooperation Fund with Colombian Civil Society". Afro-Colombian communities of Chocó ", project with which the necessary actions were completed to have a completed PDD.

During this process, ICCO and Patrimonio Natural identified the need to join efforts with other entities, Patrimonio retired its activity in the area, and Fondo Acción, an organization with extensive experience in REDD + projects, joined this project. Its experience includes the support to other the REDD + Project in the collective territory of COCOMASUR and is the implementing agent of 8 REDD + projects belonging to Afro-Colombian and indigenous Communities in the Colombia's Pacific region.

Currently, Los Riscasles, ICCO and Fondo Acción work together to give continuity to the community strengthening that makes viable for the communities the opportunities of carbon markets and ecosystem services associated with conservation processes in high biodiversity territories.

1.7 Ownership

Based on the VCS Standard: VCS Version 4.4, Section 3.7.1, the project demonstrates that the proponents have ownership over the emission reductions under subsection 3:

- 1) Project ownership arising or granted under statute, regulation or decree by a competent authority.
- 2) Project ownership arising under law.
- 4) Project ownership arising by virtue of a statutory, property or contractual right in the land, vegetation or conservation or management process that generates GHG emission reductions and/or removals (where the project proponent has not been divested of such project ownership).
- 5) Project ownership arising from the implementation or enforcement of laws, statutes or regulatory frameworks that require activities be undertaken or incentivize activities that generate GHG emission reductions or removals.

The project proponent, the community itself, is the legal owner of the land and forests in the project area. Through the laws and policies, specifically the Colombian Constitution and several additional pieces of legislation—including Law 70 of 1993 (Consejos Comunitarios) — the lands belong to the community, and cannot be sold, transferred or have liens set upon them. The community lands are autonomous and have their own governance structure. Specific titling is formalized through resolution bills issued by the National Land Agency (Agencia Nacional de Tierras in Spanish), before INCODER, the agency in charge of land title issuance in Colombia. According to Law 70, the Afro-descendant communities have clear rights to their lands and forests, as long as the latter get managed according to their ecological function.

In addition to granting land rights, Chapter IV of Law 70 gave inalienable rights to the Communities to the renewable resources, forests, genetic materials and traditional knowledge. INCORA (Instituto Colombiano de la Reforma Agraria, Colombian Institute for the Agricultural Reform) now the Agencia Nacional de Tierras, (National Land Agency), by Resolution No.002206 of December 4, 2002 awarded 31.469,9 hectares to the Afro Colombian communities organized and integrated into the General Community Council of Riscales.

The law in Colombia provides for various rights of use for the ethnic afro descendant communities with ancestral traditions, with regards to the mangroves. Mangroves are considered public goods, but are included in territories titled to Community Councils, as there are rivers, or beach areas. Considered a protective forestry reserve, mangrove protection falls under the ecological function assigned to the titled lands under Law 70/93. Rights of use derived from this category of ecosystem protection are consistent with the types of ownership 3.7.1 (1), (2), (4), and (7) according to VCS Standard v4.4. These laws (Constitution and Law 70) have given the ancestral ethnic communities the right of title to the lands and resources they have traditionally occupied and used, and the land titles assign an ecological obligation to the ownership. Moreover, Resolution 1602/95, together with Article 4 of Law 1377/2010 allow for domestic use of mangroves to right holders, or regular users of mangroves. Moreover, the right to prior consultation about administrative acts about the use of mangroves would always make these ecosystems subject to the usage objection by the local ethnic communities. For this reason, a request has been sent to the Ministry of the Interior to request information on the need to carry out prior consultation, for which a filing number is currently available (Annex 70. Gmail - MININTERIOR Confirmación de Radicación IdControl_ 426441).

ILO Convention 169, article 15 also provides a legal safeguard for the communities on their right to use, manage, and conserve the natural resources present in their territories. The government has recognized that the last rights to use or not use the forests in the REDD+ territories belong to the communities. Therefore, it is commonly understood that all carbon rights derived from the use or not use of the natural resources should pertain to the holders of the rights of use of the natural resources.

As the VCS Standard VCS Version 4.4, Section 3.7.1, (6) mentions:

“An enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions or removals which vests project ownership in the project proponent.”

The project established an effective financial and administrative support mechanism to manage all investments and proceeds—from carbon and non-carbon—and to distribute cash flows to the collective projects and investors in an efficient and transparent manner over the REDD+ project implementation time frame.

Evidence of Protecting Right of Use

The project proponents have agreed that their boundaries will be protected and patrolled, to protect Right of Use and that they will coordinate with local administration to determine which types of actions can be undertaken in the case of illegal trespassing.

1.8 Project Start Date

The mangrove restoration agreements are the evidence to support April 1, 2014, as the start date of the REDD+ Riscales project. This date corresponds specifically to agreement No. 04, signed between the General Community Council Association of los Riscales (project owners), Patrimonio Natural (entity accompanying the project) and the MarViva Foundation (technical entity) and the Mangrove Restoration Group of the Tribugá Gulf, as can be seen in the Annex 40 Carta de intención proyecto REDD+. The creation of this agreement highlighted the importance of inter-institutional partnerships in environmental conservation and the implementation of actions to mitigate GHG emissions (see Annex 1 Nuqui and Jurubira mangrove restoration agreements, and Payment's mangrove restoration agreement).

This approach is in accordance to VCS Standard v 4.4, which indicates that the project start date is the date on which the project began generating GHG emission reductions or removals. As can be seen in Clause one, the objective of these agreements is: "Contribute to the conservation of the mangrove ecosystem of the Gulf of Tribuga through: the recovery of deteriorated mangrove areas from mangrove planting and the maintenance of these areas, and ii) zoning compliance and management guidelines established within the framework of the mangrove management process in the Tribuga Gulf. In addition, as can be seen in Clause four, nursery activities, preparation of the land and planting (restoration) are some of the activities that the communities commit to carry out in the mangrove restoration areas. The next figures show the example of the mangroves' nursery and restoration activities (Annex 41 List of participants in the Sembrar y cosechar leña. Manual para el establecimiento de huertos leñeros), Annex 42 List of participants for the production of organic fertilizers and Annex 67 List of Beneficiaries cook stoves.

All of these being the activities implemented that resulted in a manual for the community annex 5 Sembrar y cosechar leña. Manual para el establecimiento de huertos leñeros.



Figure 1. Example of mangroves' nursery made in the project's framework



Figure 2. Example of mangroves' restoration made in the project's framework

Additionally, Annex 20 (Mangrove Management Plan), which covers the management plan for the Tribugá mangroves as well as planting and harvesting firewood, is one of the available manuals. The manual guides the process of establishing woody orchards (dendro-energy crops) (Annex 5. Sembrar y cosechar leña. Manual para el establecimiento de huertos leñeros). These documents detail the results of the participatory processes carried out by the community of the General Council of Los Riscales in collaboration with ICCO, Natural Heritage, and the Embassy of the Kingdom of the Netherlands. The memories contained in these documents reflect the collaborative efforts in the development of forest management plans, specifically designed for the protection and sustainable management of mangroves in this region

of Colombia. These manuals serve not only as valuable resources for the community but also as a practical guide for the implementation of conservation strategies and the sustainable use of forest resources. In this context for the sustainable mangrove management, various actions took place to support the conservation of these ecosystems and the development of local communities. Training workshops were held to raise residents' awareness about the ecological importance of mangroves, thereby facilitating a change in attitude towards the responsible use of resources.

Agreements to monitor the health of ecosystems and develop zoning strategies to prevent the improper occupation of critical areas were established. Analyses on wood use, which led to the promotion of stoves that consume less firewood, were conducted. Training on how to establish firewood gardens and explore productive alternatives for those who rely on firewood sales was also carried out.

On the other hand, we identified potential sustainable economic activities like ecotourism and responsible fishing, which aim to conserve mangroves and provide livelihood options for the communities for deforestation reduction. These efforts have been critical for ecosystem recovery and have fostered greater awareness among the population about the need to preserve ecosystems, ensuring their sustainability and continuous access to environmental services.

The milestone that marks the beginning of the project is the publication of the document entitled "Sembrar y cosechar leña. Manual para el establecimiento de huertos leñeros (Annex 5)", in 2014. This document describes the activities related to planting and establishing nurseries, which were carried out during 2014 marking the start of the project.

The VCS Standard v 4.4, which stipulates that the project start date is the point at which reductions or removals of greenhouse gas emissions start to occur, aligns with this approach.

1.9 Project Crediting Period

The initial accrediting period began on April 1st, 2014 and ends on March 31st, 2044, for a total duration of 30 years¹.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

¹ Verra granted the project an exception to the requirement, Section 3.8.3 of the VCS Standard, v4.4, see considerations in Annex VERRA_2022

Project Scale	
Project	X
Large project	

Year	Estimated GHG emission reductions or removals (tCO _{2e})
year 2014	69.701
year 2015	92.936
year 2016	92.936
year 2017	92.936
year 2018	92.936
year 2019	92.936
year 2020	92.937
year 2021	106.332
year 2022	106.332
year 2023	106.332
year 2024	106.332
year 2025	106.332
year 2026	106.332
year 2027	106.332
year 2028	106.332
year 2029	106.332
year 2030	106.333
year 2031	106.333
year 2032	106.333
year 2033	106.333
year 2034	106.333
year 2035	106.333

year 2036	106.333
year 2037	106.333
year 2038	106.333
year 2039	106.333
year 2040	106.334
year 2041	106.334
year 2042	106.334
year 2043	106.334
year 2044	26.587
Total estimated ERs	3.099.560
Total number of crediting years	30
Average annual ERs	99.985,8

1.11 Description of the Project Activity

The project aims to achieve GHG reductions by avoiding unplanned deforestation in the project area, which are primarily caused by agriculture, cattle ranching, and settlements. Project activities then have to address the main deforestation cause, which is the need to generate income. This requires a combination of Governance, and Productive activities that can both help prevent deforestation as expansion of the agricultural frontier, or as intensive logging.

The project activities have been designed based in close communication and participation of the local communities and respected the previous, free and informed consent Riscals's Local communities have participated in the identification of main deforestation and forest degradation drivers and in the types of measures to mitigate them, considering that they are primary agents in the territory. For complete tables of the drivers of deforestation and forest degradation, see Section 3.4 Baseline Scenario. The following main project activities have been defined and will create emission reductions, as they will help prevent or reduce deforestation and forest degradation and allow the regeneration of already degraded areas.

Currently, there is no jurisdictional initiative in Colombia registered under any of the voluntary market standards. However, one initiative has been identified in the VERRA registry for the department of Chocó (where the Los Riscales REDD+ project is located). Chocó Department, Colombia Nested JNR FREL Project ID 5079, was signed on the VERRA platform on September 17, 2024, and its registry status is Under Development. Considering the project's start date in 2014, the Los Riscales REDD+ project began implementation prior to the jurisdictional initiative, and the Los Riscales project registration documents were uploaded to VERRA on August 31, 2018

Aware of the overlap between the REDD+ project and the jurisdictional proposal Choco Department, Colombia Nested JNR FREL, the proponent of the REDD+ Los Riscales project, undertakes to monitor the development of the implementation of the jurisdictional initiative and maintain dialogue with its proponents, in order to exclude the area of the REDD+ Los Riscales project from the accounting of the jurisdictional initiative accounting and avoid potential double counting for subsequent verifications.

Governance

The project involves the community stakeholders: Los Riscales General Council, which in turn organizes the nine minor councils of local communities. Other stakeholders involved are: ICCO Cooperation, Swedish-Norwegian Cooperation Fund (FOS), Kerk in Actie (KIA) and Fondo Acción.

General council and minor councils:

General Community Councils are the recognized ethnic authorities for the Afro Colombian communities, they are non-profit and private entities (Annex 43), in accordance with Law 70 of 1993 and Decree 1745 of 199. This council is made up of a general assembly, a board of directors, and a legal representative. Thus, Los Riscales General Community Council represents the nine minor councils (Termales, Partado, Jurubirá, Jovi, Coquí, Panguí, Arusí, Nuquí y Tribugá) and is responsible for implementing and executing the REDD+ project.

ICCO Cooperation:

Promoter and co-financer, ICCO provides technical support to the Los Riscales General Community Council and creates and manage the necessary funding for the project implementation.

FOS:

The FOS (Swedish-Norwegian Cooperation Fund) acts as the main funder of the project, providing the essential resources for its implementation.

KIA:

This entity complements the efforts of the FOS, also providing financial resources. Your financial collaboration supports the financing provided by the FOS, strengthening the project as a whole.

Fondo Acción:

Fondo Acción has played the role of ICCO's partner for the preparation of the RISCALLES REDD+ PROJECT document.

Strengthening of Land-tenure Status and Forest Governance

The project "Forests & Climate Change: Consolidation of territorial rights Afro-Colombian communities of Chocó" financed for FOS - Swedish-Norwegian Cooperation Fund with Colombian Civil Society and Interchurch Cooperative for Development Cooperation (ICCO) with resources of Kerk in Actie (KIA), has made it possible to move decisively for "Strengthening of Land-tenure Status and Forest Governance". This FOS-KIA Project is executed in alliance between ICCO and "Fondo Patrimonio Natural". Within this framework capacity building activities for Los Riscalles have been carried out in the areas of forests, climate change and REDD+. By November 2018, 10 (ten) local capacity building workshops had been held, 4 (four) local governance strengthening assemblies had been held, and a first proposal for the REDD+ benefit-sharing mechanism had been elaborated and socialized. In addition, Los Riscalles has been supported to get closer to the national entities that lead the design and implementation of the Integrated Strategy for Control of Deforestation and Forest Management "Forests territories of life". As well as for the participation of members of Los Riscalles in events, decision-making bodies, lobbying and other spaces for dialogue related to the issues of forests, climate change and REDD+ and in the Chocó Inter-Ethnic Solidarity Forum. There was also an exchange of experiences tour in the municipality of Acandí, to visit the REDD+ project of COCOMASUR, the Afro-Colombian community most advanced in this kind of projects (Annex 2 Strengthening capacities FOS-KIA Project).

Through the REDD + project, it will continue to assist communities in updating their internal rules, such as their by-laws, taking into account the community commitments made within the context of the REDD+ project. For example, by-laws do not currently contain information about benefits sharing or about the use of revenues generated by levies on productive activities. The updated by-laws will be socialized among the communities, and then approved according to established procedures including approval by the General Assembly. In addition, the project will strengthen the capacity of Community Boards by supporting travel by board members to different townships.

Also, the project will assist the communities in raising awareness and establishing private boundaries within the titled community land. Any new boundaries will be included in a land allocation plan, which will be disseminated to the communities. The General Assembly will provide formal approval of the plan. Strengthening private property boundaries, and awareness, will create more secure property rights for individual families and will promote additional control, as each family will be responsible for overseeing their own individual parcels (i.e. helping to avoid illegal logging).

1.11.1 Support the Development and Implementation of Sustainable Forest Management

Land Use Management Plans

The municipality of Nuquí, where the collective territory of Los Riscales is located, is a strategic coastal zone for the connectivity and conservation of terrestrial, marine and coastal ecosystems of national importance. These ecosystems sustain the hydrobiological and fishing resources on which all the coastal communities of the northern Pacific of Colombia depend. Under the leadership of Los Riscales and in concert with local authorities, community organizations and support, was declared in 2014 the Regional District of Integrated Management (DRMI) Gulf of Tribugá Cabo Corrientes (See Annex 3 DRMI Acuerdo 011_2014). This DRMI covers 60,183 hectares of marine and coastal ecosystems (mangroves) that are part of the Marine Protected Areas Subsystem (SAMP). DRMI allows sustainable productive activities, controlled and regulated extractive activities; research, education, ecotourism and recreation, among others. Its management plan has already been formulated in concert with Los Riscales and other actors. And this plan is in the process of legal adoption.

This Regional Integrated Management District (DRMI) has been developed through a community participatory process that has become a model for other regions of the country. The collaboration between entities such as the Consejo Comunitario Mayor Los Riscales, the Local Councils, the Mesa de Ordenamiento, the GIC-PA, the Mayor's Office and Codechocó, together with NGOs such as Conservation International Colombia, WWF Colombia, Fundación MarViva, Mano Cambiada, have allowed for an adequate appropriation of the territory, especially in the marine zone. This has resulted in the early implementation of fisheries management measures, the promotion of local economic alternatives and the establishment of a scheme for the long-term conservation of natural resources.

As a result of this process, the communities of Los Riscales have acquired significant competencies to plan and manage the spaces and renewable natural resources within the DRMI, ensuring that they are compatible with their conservation objectives. The

DRMI and the REDD+ project are complementary, as the DRMI focuses on marine and mangrove ecosystems, while the REDD+ project focuses on mangrove and inland forest conservation. Fisheries and mangrove management activities are also part of REDD+ actions, which have great potential to avoid deforestation.

Therefore, the REDD project is perfectly articulated with DRMI and is a strategic tool for leveraging resources that contribute to the implementation of its management plan. In addition, the REDD+ project will support the updating and harmonization of the other existing land use management plans with the DRMI management plan.

Mangrove management plans are being developed and updated in a participatory and democratic way. The mangroves represent a fragile ecosystem source of an important biodiversity and essential for its reproduction. It needs its own management: suitable for its restoration and conservation (See Annex 4: “Plan de Manejo Integral de Los Manglares de Tribugá - Fase Formulación”).

The mangrove reforestation activity has been developed by the communities' own initiative for more than a decade; the villagers have become aware of the importance of conserving this resource and have taken actions for their own well-being. The Riscasles Mangrove Management Plan and the institutional support of entities such as IIAP and Codechocó have also helped these actions to continue gaining strength in the territory. The mangrove seeds are collected to be planted in areas that are deteriorated by the effects of climate change, erosion or logging and need to be reforested; a concrete action is evident in the planting of red mangrove 50 meters inland from the banks of the Chorí River in Jurubirá.

The REDD+ project will involve the communities in assessing and updating existing land use management plans according to priorities identified during the REDD+ planning process. The plans will include defined zones that can be used for timber harvesting, as well as areas for settlements, cropland, and conservation areas, and the delimitation of forest reserves.

Among the plans that will be updated and articulated with the communities and disseminated for approval of the General Assembly are the: Territorial Development Plan, Territorial Planning Scheme 2005-2016, Ethno Development Plan for Tribugá Gulf Communities 2007-2020, Mangrove Management Plan and Forest Management Plan.

1.11.2 Delimitation Forest, Tenure and Ownership Boundaries and Areas of Forest Protection

Within the framework of the projects led by Interchurch Cooperative for Development Cooperation (ICCO) and Natural Heritage, significant progress was achieved in raising

awareness and materializing the will of Los Riscasles to establish a corridor for the conservation and sustainable use of the forest in its territory. (Annex 44. Corredor conservación del Golfo de Tribugá). Comprehensive management processes of the mangroves of the Gulf of Tribugá were also promoted (Annex 45. Planting report for the community recovery of mangroves as a strategy to increase carbon reserves. and Annex 20. Mangrove management plan of the Gulf of Tribugá), and published a document that details community conservation experiences in the region (Annex 6. Sembrando y construyendo un mejor vivir - recuperación del manglar Planting and building a better life).

In this sense, the community of Consejo Comunitario General Los Riscasles has adopted an exemplary participatory approach in its efforts to restore mangrove ecosystems, recognizing their crucial importance for the ecological balance and sustainability of the territory. Through collective initiatives aimed at mangrove recovery, the community seeks not only to increase carbon stocks, but also to foster social cohesion and inclusive decision-making. This collaborative approach has facilitated the activation of climate finance schemes through the REDD+ system, demonstrating how active community participation can drive effective and sustainable solutions for environmental conservation, while promoting the well-being of the local population.

The project recognizes that legal recognition alone (i.e. strengthening of land-tenure status and forest governance) may not be enough to prevent deforestation and/or degradation in the project areas. Therefore, the project will form and train REDD+ surveillance and monitoring teams of local community members in the territory, to monitor conservation commitments, deforestation, and degradation through mobile patrols.

In addition, as indicated above, the REDD+ project will support the updating of the Land Use Management Plans and their articulation with the DRMI Management Plan. Due to the importance of this existing information on environmental and productive zoning in the territory of Los Riscasles, the REDD+ project will continue to disseminate it and support its appropriation by the communities. However, it is important to keep in mind that the actual resource flows that will be leveraged by the REDD+ project are decisive for the implementation of the Land Use Management Plans, including the DRMI management plan.

As a result of the Tribugá Gulf Mangrove Management Plan, the local community councils of Jurubirá, Tribugá, Nuquí, Panguí and Coquí are home to 2,545 hectares of mangroves, representing 96.1% of the total registered for the Asociación de Consejos Comunitarios General Los Riscasles de Nuquí. Of these areas, 1,458 hectares were classified as sustainable use, especially in the councils of Tribugá (69.8%) and Nuquí

(16.7%). In addition, the Tribugá council was identified as having the largest extension of recovery areas (45.1%), followed by Jurubirá (20.9%) and Nuquí (20.2%), with a total of 574 hectares in this category. In terms of preservation, 510 hectares were zoned, of which 68.4% are in Tribugá. The community of Coquí stands out for its conservation efforts, reserving a significant portion of its mangroves for its ecological function, driven by the benefits of ecotourism. A fairly uniform forest structure was also observed in all management categories, with an average of 779 to 800 trees per hectare. Through community workshops, sustainable management norms were established, such as the prohibition of cutting mangroves for seed production, and minimum sizes were defined for timber extraction and harvesting of piangua (bivalves like *Anadara tuberculosa* (Sowerby, 1833) y *Anadara similis* (Adams, 1852). Temporary closures were also agreed upon for certain resources to ensure their sustainability.

Entities such as the Ministry of the Environment and Sustainable Development (MADS), Codechocó, and the Utría National Natural Park participated in the formulation of the Tribugá Gulf Mangrove Management Plan. Academic and research institutions such as Invemar, Universidad Tecnológica del Chocó (UTCH) and Pontificia Universidad Javeriana (PUJ) also collaborated. Environmental organizations such as WWF, Conservation International, and USAID's BioRedd+ Program, along with Fundación MarViva, Fundación Accionar, and the Empuja Communications Collective, provided technical and financial support.

From the community, the Asociación de Consejos Comunitarios General Los Riscales and the communities of Jurubirá, Tribugá, Nuquí, Panguí and Coquí were actively involved, with mangrove delegates such as Nohelia Mosquera, Alirio González and other representatives leading the control and monitoring. This integrated collaboration allowed the development of an effective plan for the conservation and sustainable management of the gulf's mangroves.

In the last mentioned publication, *Sowing and building a better life* Community conservation experiences in the Gulf of Tribugá, a community experience is presented in the Gulf of Tribugá, where the Natural Heritage Fund has worked for several years to strengthen the governance of the Local Councils, conserve natural resources and improve the quality of life of the inhabitants. Through the Conservation Incentives Project, financed by the Embassy of the Kingdom of the Netherlands, we sought to implement incentives that would benefit the community and favor the management of this rich territory. Since 2011, we have collaborated with the Los Riscales General Council, presidents of the Local Councils, community leaders, the MarViva Foundation and the Equilibrio Foundation. The publication “*Sowing and building a better life, community conservation experiences in the Gulf of Tribugá*” documents the results of

this alliance. In addition, we sought to strengthen the training process of the EN PUJA Communications Collective, a group of young people from Nuquí, who conducted the research for this material. The document highlights the various incentives applicable to the social and cultural context of the region, such as firewood-saving stoves, wood-fired vegetable gardens, non-timber productive alternatives and the recovery of the mangrove and forest.

1.11.3 Silvopastoral and Assisted Reforestation

Within the framework of the projects led by Patrimonio Natural, several sustainable practices and incentives for the conservation and sustainable use of the natural resources of the territory of Los Riscales have been identified. Among them, the following stand out the sustainable practices about planting and harvesting firewood to reduce the pressure on other areas of the forest and of the mangroves following the existing technical manuals (see Annex 5: “Sembrar y cosechar leña. Manual para el establecimiento de huertos leñeros”) and Annex 14 Mangrove management plan of the Gulf of Tribugá).

Measurement of forest growth plots and mangrove restoration have also been carried out using direct sowing techniques and the sowing of germinated seedlings in nurseries. (See Annex 6 “Sembrando y construyendo un mejor vivir - Recuperación del manglar” and Annex 8 Parcelas y restauracion manglar). Communities are trained in seed collection and selection, land preparation and planting for restoration of mangrove areas (See Annex 6 Manual recuperación manglar).

The project will help establish forestry management plans, so that reduced levels of forest harvesting are accompanied with compensation investments, and volume restrictions, so that the biomass balance grows over time. This includes a combination of assisted natural reforestation, regular business oriented or compensation projects and silvopastoral systems in the few areas that were opened to make way for livestock. Silvopastoral and assisted natural reforestation will allow the regeneration of exploited species such as chachajo, wina, cedar, jigua and choiba and will ensure the provision of the forest ecosystem services.

The publication “Planting and Harvesting Firewood: A Manual for the Establishment of Firewood Gardens” was developed as part of the Conservation Incentives Project in the Pacific region pilot, under the responsibility of the Fondo Patrimonio Natural and financed by the Embassy of the Kingdom of the Netherlands. These activities were possible thanks to the collaboration and joint work between the General Council of Los Riscales, the technical team of the Natural Heritage Fund and the support of the MarViva Foundation.

The “Tribugá Gulf Mangrove Management Plan” document details the allocation of 574 hectares for mangrove recovery. Tribugá is the main contributor with 45.1% of the area, followed by Jurubirá (20.9%), Nuquí (20.2%), Panguí (11.1%) and Coquí (2.6%). For preservation, 510 hectares have been allocated, with Tribugá again leading (68.4%), followed by Jurubirá (13.3%), Coquí (10.6%), and Nuquí (7.6%). Coquí, in particular, has dedicated more than a third of its mangroves to preservation, benefiting from ecotourism.

The mangrove structure shows an average of 779 trees with a basal area of 18.6 m² per hectare in sustainable use zones, 792 trees and 17.2 m² in recovery zones, and 800 trees and 18.5 m² in preservation areas, with recovery having a slightly lower basal area. Through participatory workshops, community regulations were established, such as the prohibition of cutting seed-producing mangroves and the maximum use of cut wood. Minimum sizes for resource extraction and temporary closures were also defined, including restrictions on the extraction of female piangua during certain periods and the hunting of iguanas at specific times.

1.11.4 Energy Alternatives for Cooking Food

Through the pre-feasibility study of the REDD project in the region of Los Riscas, in the Gulf of Tribugá, formalized between Patrimonio Natural and South Pole Carbon Asset Management, the feasibility of implementing energy stoves for cooking was examined, considering that these had managed to reduce emissions through initiatives such as efficient stoves (Annex 46. Prefeasibility study).

Subsequently, in order to comply with the above, cooperation agreement No. 012 of 2012 was created between Patrimonio Natural Fondo para la Biodiversidad y Áreas Protegidas, and Fundación MarViva. The purpose was to promote the adoption of efficient technologies for cooking food in the region of Los Riscas, Gulf of Tribugá, through the implementation of wood-saving stoves. This sought to reduce pressure on mangrove forest resources by reducing the amount of wood extracted and improving combustion efficiency. The agreement involved end consumers and woodcutters, who benefited from locally designed wood-saving stoves. This effort was part of a system of incentives and compensations aimed at mitigating the deterioration of local ecosystems, especially mangroves, which were affected by excessive firewood consumption (Annex 47. Stoves and Annex 48 Informe fogones ahorradores).

Within the framework of the REDD+ project, improved stoves have been built in the homes of families that are part of the communities of Los Riscas (See Annex 49 Beneficiaries cook stoves Nuqui). There is also a technical manual for the construction of this type of improved stoves (See Annex 7: “Cocinar Conservando. Manual para la

construcción de fogones ahorraleña”). See in the figure 3, the example of the improved stoves made in the project’s framework.



Figure 3. Example of the improved stoves made in the project's framework

The project will help to continue with the change and the adoption of energy alternatives for the cooking of food and other practices that require the use of firewood from the mangrove forest as a fuel, considering the dynamics fostered in the territory to reduce this action of high impact on forest ecosystems. The tests carried out and adopted of more eco-efficient kitchens have shown high benefits not only in the reduction of the consumption of firewood, but also in benefits for the well-being of families and the reduction of health problems.

1.11.5 Productive Alternatives

Development of Potential Agricultural Activities and Forest Value Chains

Currently, communities have very limited opportunities for generation of surplus revenues, as most income generation activities are mainly for subsistence and very seldom include trading with external markets.

Within the framework of the projects led by Patrimonio Natural, corporate social responsibility initiatives have been promoted, through which the hotels in the area consume at fair prices the agropecuaries products produced by the community in their farms and areas already delimited for cultivation. The REDD+ project will continue to

strengthen these initiatives and support the design and implementation of sustainable production schemes and the recovery of traditional knowledge and gastronomy.

The project activities will increase productivity and agricultural yields on existing cropland or degraded underutilized land and will include activities as agroforestry.

Also, project activities will promote the adding of value to the production chain, with participation from local communities, so that part of the profits obtained at the last part of the value chain can be poured back to the REDD+ communities. As stated previously, Riscales has a wide variety of productive options that could be developed, so the project will explore the possibility of establishing a revolving fund to help finance value chain development, including technical assistance for planting, harvesting, post-harvest activities, logistics, commercialization, transformation, and marketing.

The sustainable use of local biodiversity is considered as a conservation strategy based on the principles that to give economic value to natural resources generates interests in the community and the institution for its conservation, management, and restoration. Therefore, it implies capacitation and monitoring of sustainable practices to harvest and transform the products. The exploitation of no-timber products framed by ecological practices to develop economic alternatives, can represent the basis of the conservation and restoration plan.

Access to markets should be a condition for financing, and this will depend very much on finding buyers or industrial partners and making projects integral. Below are some of the productive activities identified:

Some of the following potential value chains are to be considered:

Coconut. In Riscales, the project will strengthen current production, and will help establish new coconut crops and will invest in the process of producing virgin coconut oil, and copra. The agroforestry scheme will be used to establish the new coconut crops, with interspersed banana, plantain (or other short-term food crops) to provide short-term income, until necessary coconut productivity is achieved.

The first phase of the development will be a study on the implementation of the processing plant of coconut, followed by the installation of backup nurseries to ensure consistent and adequate supply of raw materials to the plant. The project will assist the communities in obtaining permits, incorporating the plant, and procuring equipment. The plant will purchase products from producing families, and the project will assist in the development and commercialization of products along the coconut value chain, resulting in virgin oil and copra for domestic and international markets.

Acai. Acai (naidí or murrapo) rises naturally, and its fruit is harvested for local consumption, with seasonal and limited presence in local markets. The project will train local communities in natural (wild) harvesting techniques based on approved management plans. The project will support the communities to further develop new crops. The crops will not result in any additional deforestation or degradation, considering that they will be interspersed with products such as plantain, taro (papachina) or cassava, to provide short-term income while the acai plants are developing.

The project will provide technical assistance on yield and pest management to ensure successful production. The first phase of the development will be a study on the implementation or participation in a processing plant, followed by the installation of backup nurseries to ensure consistent and adequate supply of raw materials to the plant. The project will assist the communities in obtaining permits, incorporating the plant, and procuring equipment. The plant will purchase products from producing families and the project will assist in the development and commercialization of products along the Acai value chain, resulting in fresh pulp, sorbet, clarified juice, and/or freeze-dried Acai for domestic and international markets.

Vanilla. In the alimentary and cosmetic industry, vanilla represents an important product. International market is in big demand which can lead to a good alternative economy. Its harvest in tropical forest represents an initiative for the conservation of the biodiversity needed for the development of the plant. In Los Riscales there are already attempts to develop vanilla as a source of income.

Within the framework of the FOS-KIA project, 20 members of Los Riscales have been trained in the activities for the use of vanilla and the first version of the business plan for this product was prepared (See Annex Vainilla FOS KIA Project). And there is a technical protocol for the use of vanilla in the territory of the Riscales. (See Annex 9 Protocolo aprovechamiento flora no maderable Biocomercio_Vainilla).

The project will help develop crops, as well as commercialization and/or transformation of beans to the industry respecting a sustainable process.

Cacao. Cacao is a very reliable cash crop. However, given the difficulty to get it to market from Riscales, it may be worth trying to link to post harvest and transformation business opportunities, such as the production of cocoa liquor, butter, or powder, or the production and commercialization of fine and aromatic cacao for niche markets.

Sugarcane. Riscales productions of sugarcane, can be transformed to make jaggery know in Colombia as panela and in other Latin American countries like piloncillo, or to

produce ancestral alcoholic beverages that are very important to their culture (ie, biche and curao) for local consumption.

1.11.6 Training and Capacity Building

Several activities have been carried out and it is planned to continue with the strengthening of the communities to take over the management of resources and implementation of the REDD+ project. The project will enhance the administrative capacity of communities, through The National Training Service (Servicio Nacional de Aprendizaje, or SENA) and other educational institutions, by providing courses in: accounting, financial analysis and project evaluation, environmental and social project management, markets, administration and management, and leadership. This will ensure long-term ownership and sustainability of the project after the crediting period.

In addition, within the framework of the project, have already been held workshops and awareness campaigns to increase awareness about the project, as well as its scope and benefits (See Annex 10 Memorias reuniones locales REDD and Annex 2 Strengthening capacities FOS-KIA Project). These workshops will continue to be held, especially to prioritize with the communities the social investments based on community needs at the time. Workshops will also include environmental education modules that inform participants about the importance of conservation and natural resources and will be designed specifically to include and address the needs of women.

Furthermore, the conversion of mangrove forest into fuelwood for heating and cooking has already begun to reduce by strengthening the use of wood stoves that generate higher efficiency at the time of combustion. An efficient stove is a thermodynamic device that converts most of the heat generated in the combustion process into useful heat for cooking, resulting in a decrease in the amount of fuel needed to boil a specified volume of water and in a reduction of the emissions of CO₂. The adoption of more efficient technologies becomes an important palliative in order to reduce the consumption of fuelwood and the existing dependence of the adjacent forests that serve as a primary source of raw materials. The project will evaluate the operation of the 120 stoves that have been installed in the northern area of Riscales during the past years and will continue to promote their use and building in the community council's dependent of mangrove wood.

Additionally, the project allows local communities to encourage sustainable development and land use planning through a subset of objectives and REDD+ activities that have improved your environmental awareness and will enable them to generate income from the environmental management of the natural resources that underpin their livelihood activities. This is an essential goal considering that local

economies in Riscales depend primarily on nature subsidies, limiting access to any vital space, due to deforestation or degradation activities, can have a negative effect on their domestic economies, productive activities, alimentary system and consequently in the quality of life of the members of the community.

Los Riscales has advanced positive actions related to the environment, such as:

Community network for recycling and solid waste management: creation and operation of a community network for the collection, treatment, and sale of solid waste in the 9 local community councils. The activity focuses on the collection, treatment, and sale of solid waste. In Nuquí, this network carries out collection brigades three times a week (especially plastics, paperboard, and cans). In the other townships the work is done once a month, at the end of the month, by sea.

Women's network for the production of organic fertilizer: Product for domestic use and for sale; used for planting vegetables on rooftops, for gardening and crops such as bananas.

Finally, the activities that have been prioritized as part of the project are oriented to guarantee the connection of the territory, keeping in mind that the first section of the terrestrial road “Las Animas – Nuquí” crosses the northern zone of the Council Community. The processes of logistic and commercialization of the productive chain will be strengthened and in high synergy so that the construction of the road does not disintegrate the communities of Tribugá and Jurubirá that will be divided physically by the terrestrial connection. Also, the ecotourism activities are already mitigating in part the possible disconnection effects of the road construction taking into account that services such as transport, food and lodging have been growing considering that Tribugá is one of the most attractive touristic regions in the community council.

The project actively involves local communities in resource management and activities, with training provided by SENA and other educational institutions. Sustainable practices are promoted through workshops and environmental awareness campaigns, the implementation of efficient stoves, and solid waste management. In addition, a network of women is engaged in the production of organic fertilizers, which contributes to economic development and environmental sustainability. These joint efforts seek to improve the quality of life and promote sustainable development in the participating communities.

1.11.7 Providing Alternative Livelihoods to the Deforestation Agents

Alternative livelihood activities are aimed at addressing the root cause of deforestation and forest degradation, which is economic. If the agents of deforestation and forest degradation can engage in livelihoods not exclusively based on timber extraction, they can secure income without the need to further clear forests; gradually engaging in alternative productive activities will help reduce logging, or to complement it with alternative income sources. The activities below will engage local communities in added value chains so that additional income can be earned and distributed amongst the agents of deforestation and degradation.

Ecotourism. This activity has great potential in Los Riscas, it has already been designed and is running a tourist circuit that directly benefits members of the community. (See Annex 11: “Circuito de turismo alternativo La Cumbancha”). The project will further support the development of ecotourism activities that can prove profitable and environmentally and financially sustainable. A strategy for upgrading community run tourism value chain services, such as transport, lodging, food, and tourist service provision will be sought so that revenues can be obtained from higher end travelers, under well managed cost structures.

Artisanal fishing. Like ecotourism, fishing is regulated under the DRMI and has great potential in Los Riscas. As already mentioned, the DRMI Gulf of Tribugá Cabo Corrientes has jurisdiction over the marine and coastal ecosystems (mangroves) of the area, therefore, the project will articulate and support the implementation of its management plan; artisanal fishing that complies with the guidelines established in the DRMI management plan.

Artisanal fishing is an activity that uses traditional techniques such as: harpoons, atarray, fishing nets, hand lines, purse seines and such as: harpoon, atarraya, chinchorro, espinel, hand line, purse seine nets and various types of gill nets or trammel nets (mesh 3, riflillo or lisera and trancador), which are not very technologically underdeveloped and operated from small boats. The fishermen work less than 10 nautical miles away. This activity is carried out for two main purposes one for the daily sustenance of the families and two for sale in the fishmongers' shops in the local fish market and to local people.

The REDD project will support the development of value chains for fisheries. This will include strengthening the association of local fishermen through technical assistance and training. The project will also conduct a study on species in the area that are suitable for fishing and their seasonality. This study will include life cycles of species and use of the area within this cycle. The study will then be used in training and promoting the use of fishing gear for responsible fishing in the area, respecting size, closed areas, life cycles of species, among others. The project will further purchase

motors and (refrigerated) boats for fishing groups and construct storage facilities, with cold rooms that have electricity 24 hours per day and promote marketing directly to the end buyer to increase value.

Organic fertilizer production: Abonamás, a company made up of women, participated in activities of the cumbancha alternative circuit as part of an agreement between Riscales and Bienestar Verde, through the Women's Network initiative for the production of organic fertilizer from fruit peels, banana peels and fish waste. It began in 2015 and ended in 2020. At the beginning the project had the participation of 10 women and 3 men, but over time it was dissolved leaving finally 3 women and 1 man as beneficiaries See Annex 50 Contrato con Bienestar Verde and Annex 51. Informe del contrato con Bienestar Verde.

The organic fertilizer is used for planting vegetables on rooftops, for gardening, and even for some crops such as bananas. The use is domestic and for sale. They also managed to cultivate earthworms to produce humus.

This project serves to take advantage of this type of waste, which is an environmental problem because it is not well treated due to the precariousness of the garbage collection service. The fact of collecting and giving it a new use prevents it from decomposing in the streets and ending up in the rivers, coasts, and seas, thus reducing pollution. The Abonamás enterprise was created by a group of women who joined together to produce organic fertilizer from fruit peels, banana peels and fish waste. It is used for planting vegetables on rooftops, for gardening, and even for some crops such as bananas. The use is domestic and for sale. They also managed to cultivate earthworms to produce humus.

This project serves to take advantage of this type of waste, which is an environmental problem because it is not well treated due to the precariousness of the garbage collection service. The fact of collecting and giving it a new use prevents it from decomposing in the streets and ending up in the rivers, coasts, and seas, thus reducing pollution.

The activity requires financial resources to continue its operation and formalize this group of women as an association.

In addition, the project will be engaging local communities in social fencing, forest patrolling, boundary delimitation, and other activities that provide employment and a greater financial return, compared with logging, to the communities.

1.12 Project Location

1.12.1 Geographic Boundaries

The project is located in the department of Chocó, in the municipality of Nuquí. Following are the maps depicting Colombia, the Province of Choco in Colombia, and the Community Council of Riscasles (Asociación de Consejo Comunitario General Los Riscasles) within such maps (Figure 4).

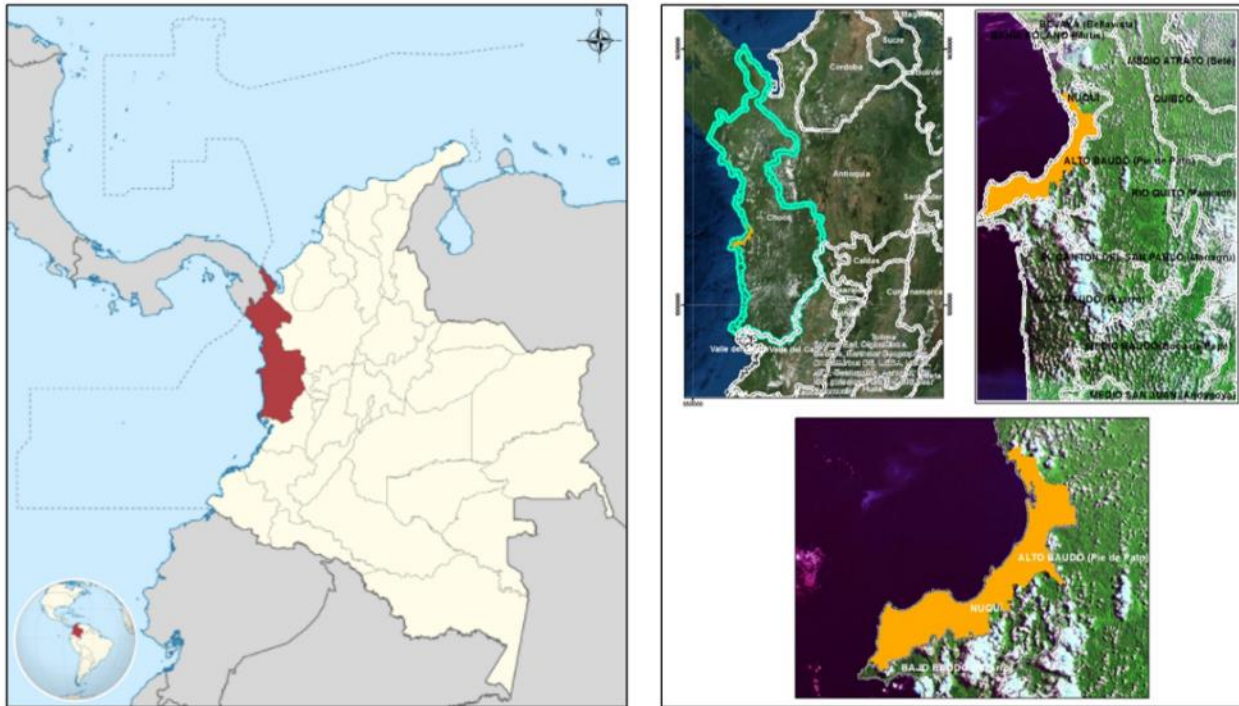


Figure 4 Map of Colombia and Province of Choco

1.12.2 Project Zone

The REDD+ project zone is defined as the entire territory of Los Riscasles community council, located in the municipality of Nuquí, in the Chocó department. This is the area within which REDD+ project activities that directly affect land and associated resources will be implemented. It is important to mention that the area of the Los Riscasles community council, was recognized by Resolution No. 002206 of December 4, 2002 and includes 31,469.9 hectares (ha), issued by INCORA Colombian Institute of Agrarian Reform. The INCORA was liquidated and its functions now partially area assumed by the National Agency of Lands -ANT. The polygon downloaded from the ANT open data portal reports an area of 36,845.21 ha. Due to this difference in areas estimations were made to corresponds to the area granted in the collective title by resolution and not to the area shown in the data portal.

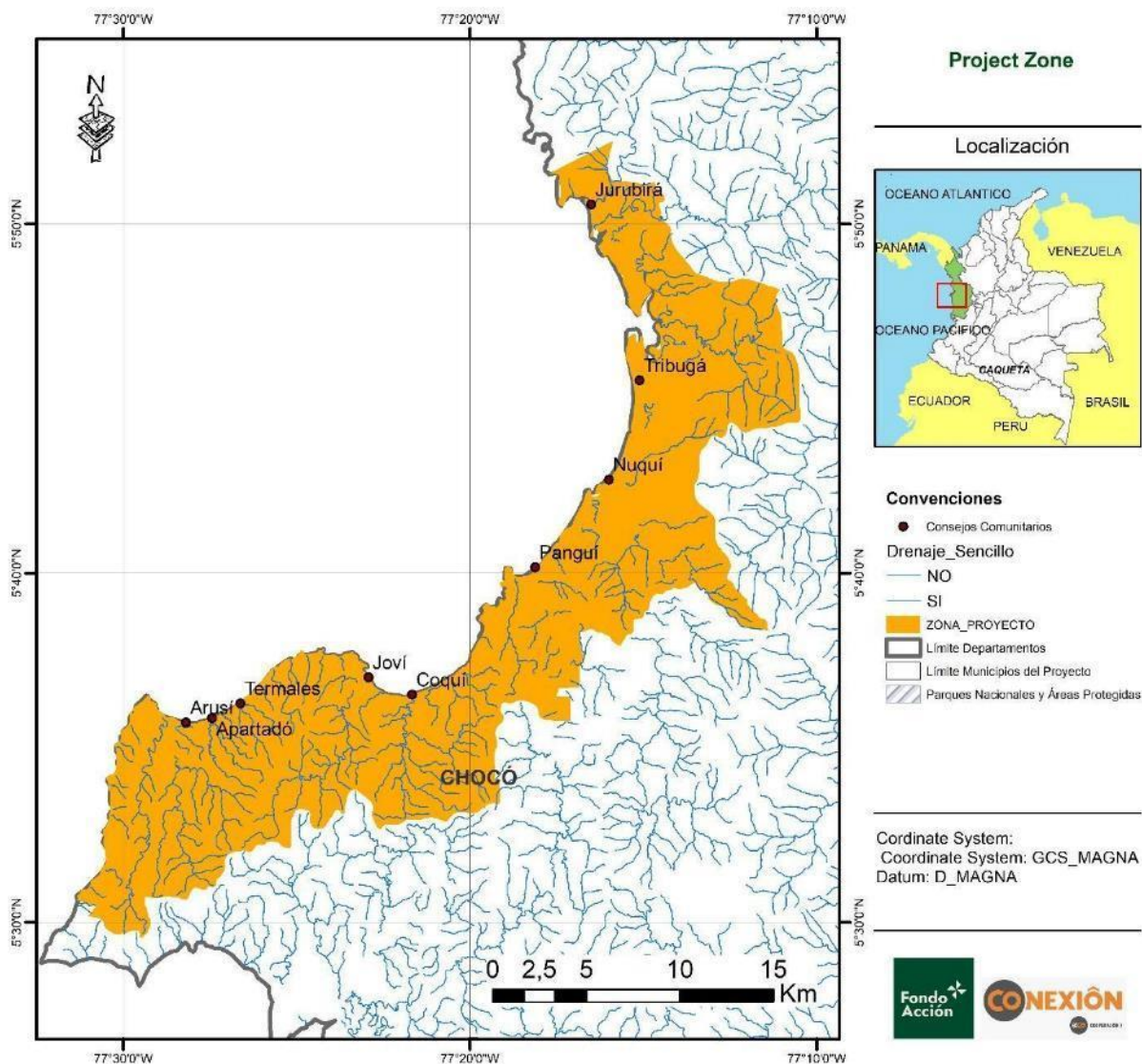


Figure 5. Project Map Zone

1.12.3 Project Area

As mentioned in section 1.12.2, the area of jurisdiction of the Los Riscas community council, according to information from the National Land Agency of Colombia data portal is 36,845.25 ha, however the area granted to the community council by official resolution is 31,469.87 ha. Considering the above, the project area is estimated in proportion to the titled area and corresponds **to 27,870.04 ha of forest**. For more details on the project area see section 5.1.1. I. The projected construction of the terrestrial connection “Las Animas – Nuquí”, which first section “Nuquí - Alto de

Copidijo², crosses through the community of Riscales are excluded from the project area, as planned deforestation is not included in the project activities.

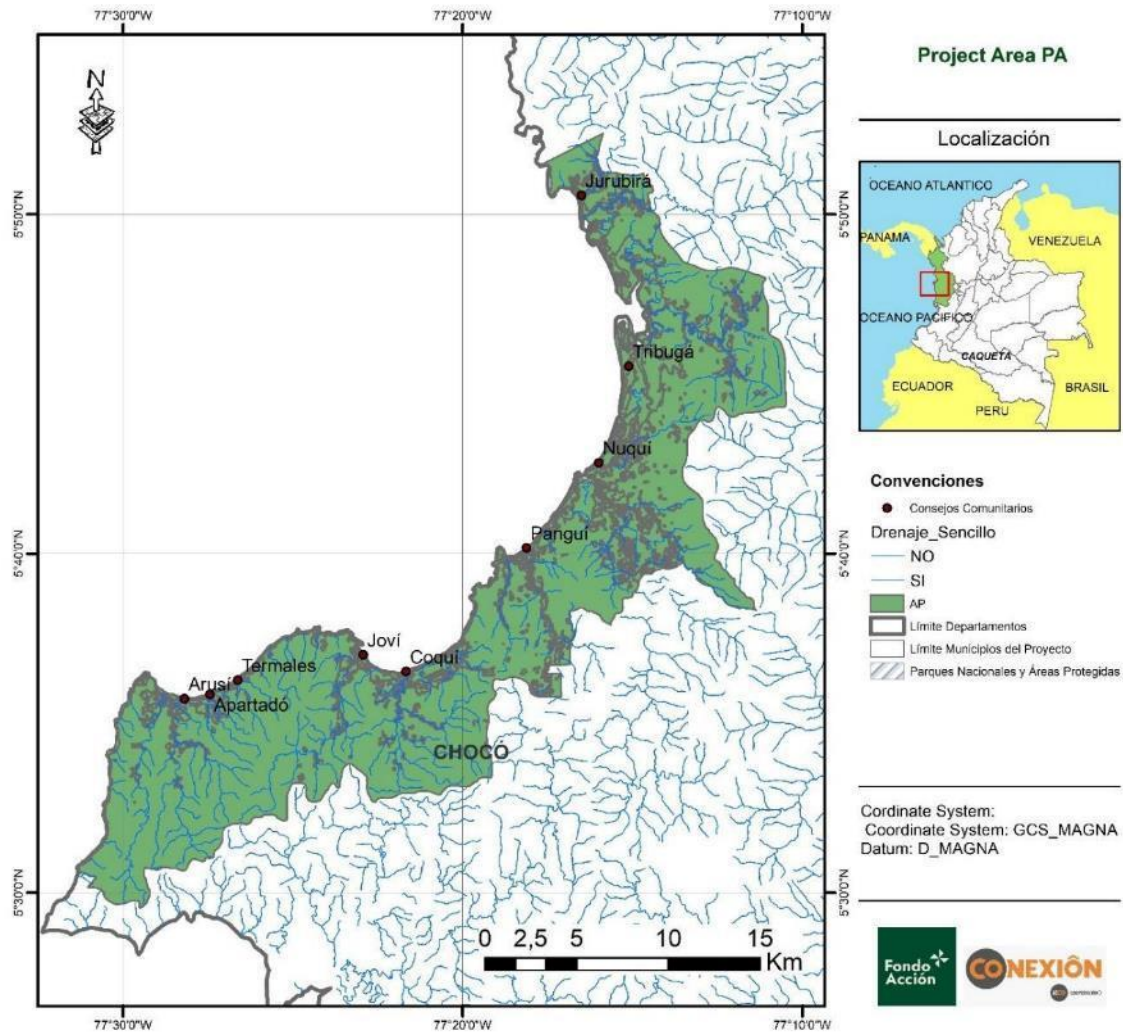


Figure 6. Project Area

1.12.4 Project Area and Reference Region

The reference area corresponds to an area of 162.313,67 ha and demonstrates similar criteria as the project area, as required by VM0007. For a map of the reference area, see Section 5.1.1.

1.13 Conditions Prior to Project Initiation

1.13.1 Project physical parameters

² <https://www.conciviles.com/proyectos/infraestructura-vial/estudios-disenos-construccion-y-pavimentacion-de-la-carretera-nuqui-las-animas/>

The Colombia Pacific Region in which the project is situated is composed of three physiographic divisions: the Occidental Cordillera flanking the eastern boundary and the Aguila Mountains to the north; the Baudó and Darién Mountains to the north; and the Pacific Sedimentary Basin to the west. The Occidental Cordillera, Aguila, Baudó and Darién Mountains result from geologic processes including the uplift of marine sediments, whereas the Pacific Sedimentary Basin consists largely of sediments originating from these same mountain ranges. As a result of these processes the region is characterized by a mosaic of varied terrain from low lying fluvial marine and relatively young, dynamic alluvial plains and steep valleys accompanied by the mountainous terrain of the Occidental Cordillera reaching elevations of up to 4,000 meters to the east and the previously mentioned Aguila, Baudó and Darién Mountains further north. Various rivers drain over a relatively short distance from the Occidental Cordillera to the Pacific, including the San Juan, Atrato, San Jorge, Cauca-Nechi and Magdalena.

1.13.1.1 Soil

Soils in the project area and project zone originate from geologic and geomorphic processes important to the Colombia Pacific Region as a whole. These include fluvial-gravitational processes delivering sediment from plutonic and volcanic, metamorphic and sedimentary rock of the Occidental cordillera (see Topography below), as well as sandstone and limestone ridges and hills, and calcareous materials from the Baudó range to the north. Alluvial and colluvial deposition occurs in the valleys originating from the Occidental cordillera and along rivers of the Baudó range (see IGAC & MA 2000. Annex 16). Alluvial plains occur on a significant proportion, close to 10% of the Pacific region, on sloping to flat terrain, deposited by the several large rivers which confluence at the Pacific Ocean. Even greater in proportion at close to 15% of the regions are the meandering alluvial plains, terraces, flood plains, swamp and marshy depressions resulting from processes of deposition and erosion by the region's largest rivers joining the Pacific, including the Atrato River flowing through Quibdó. Marine and mixed fluvial marine deposits account for various formations along the coast including marshes, estuaries, marine terraces and deltas.

The soil formations arising from these as well as climatic processes over time are complex. A soil class/landform map for the Pacific coastal region of Colombia was developed by Saatchi (2014) to help with the stratification of the landscape. The soil class data for the entire study area have been derived from the Soil and Terrain Database for Latin America and Caribbean (SOTERLAC, version 2) released in 2005 at 1:5 million scale (Dijkshoorn, et al., 2005). The assignment of soil classes was based on

matching the descriptions of the map units and comparing with the landforms and geographical description provided by Sombroek (2000).

Main soil types in the region include: heavily leached white sand soils (spodosols and spodic psamments) which predominate in the upper Rio Negro region and include arenosols, regosols, and podzols; less infertile lowland soils (ultisols and entisols, which are predominant in the western Amazonian lowlands and some parts of Brazil; more fertile lowland soils; alluvial deposits including very recent deposition; contemporary alluvial soils including acrisols with plinthic and gleyic content, gleysols, luvisols and histosols; young, submontane soils, perhaps fertilized by volcano-aeolian deposition; and, other soil types with less information (most likely histosols).

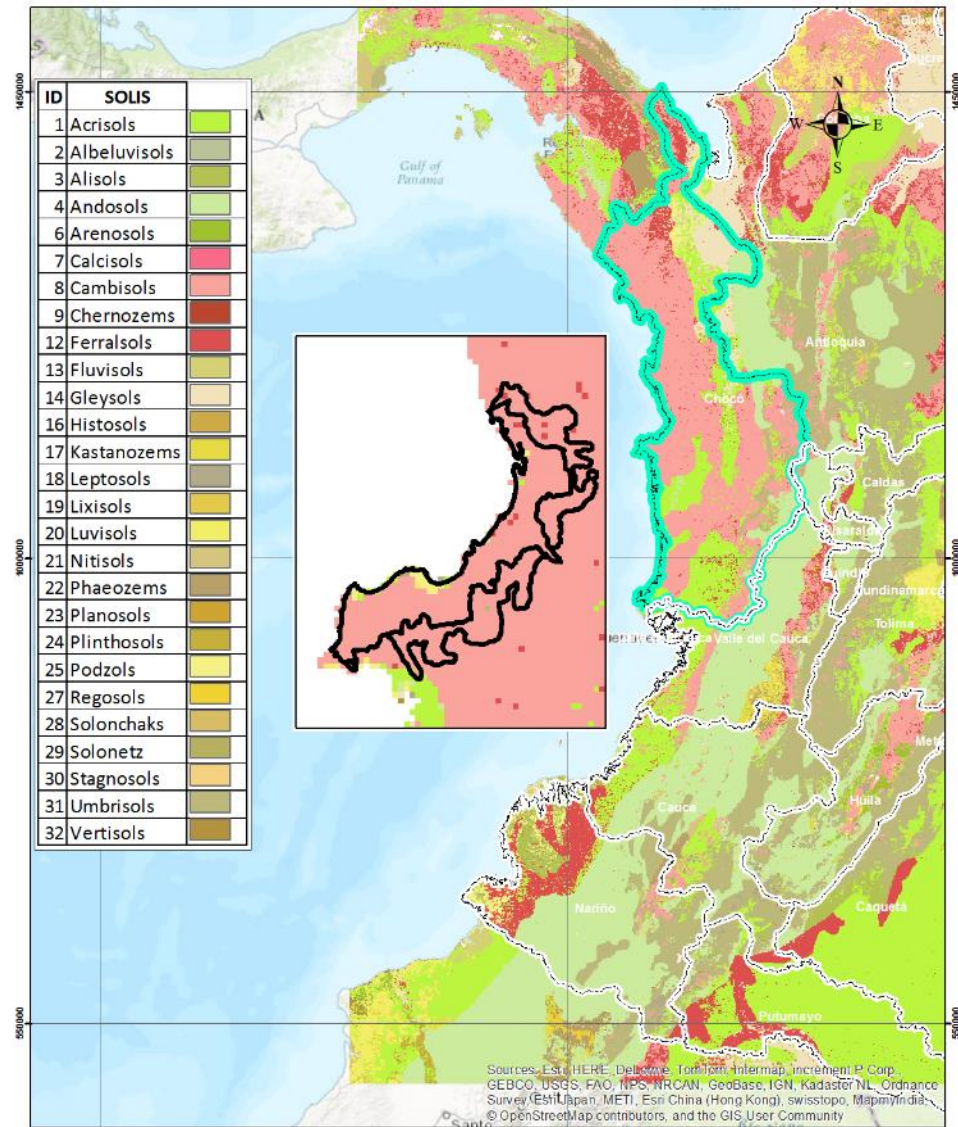


Figure 7. Main soil types. Source: Terrain Database for Latin America and Caribbean (SOTERLAC, version 2)

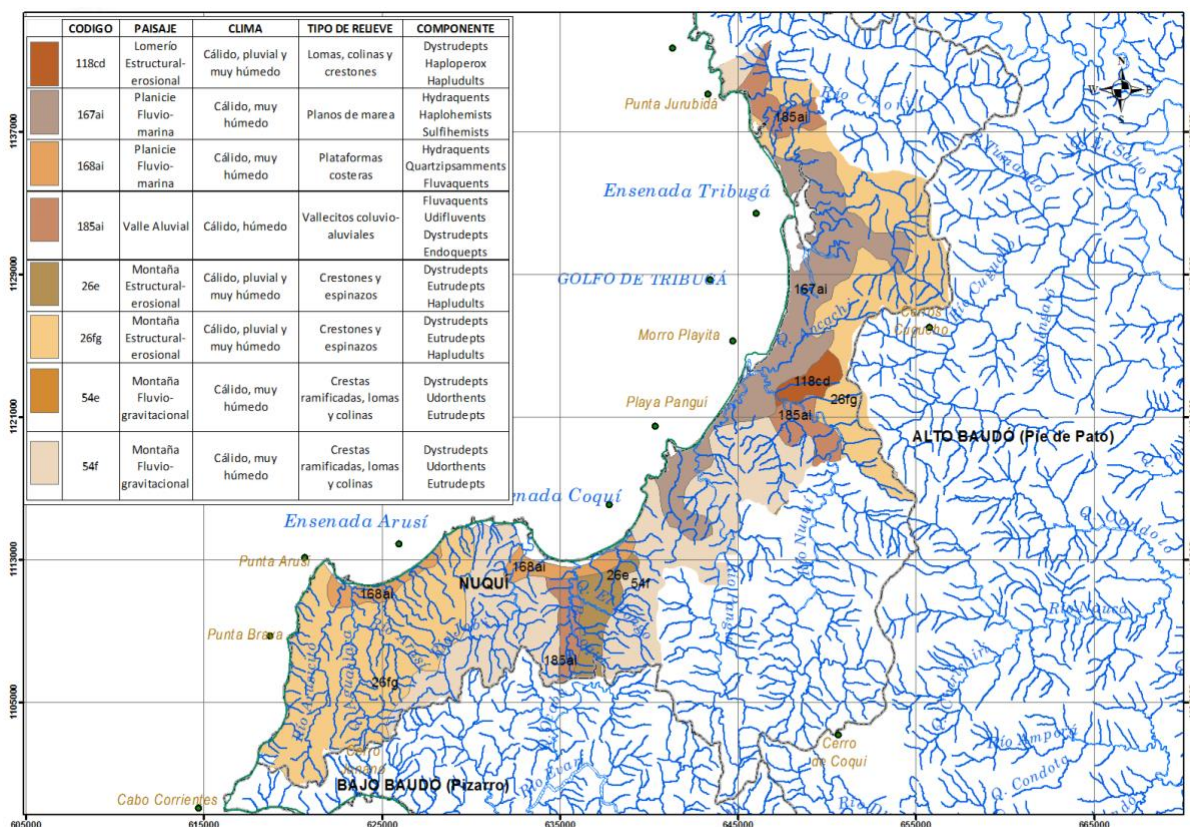


Figure 8. Map of IGAC soil classes within the project area.

1.13.1.2 Mangroves

The project area includes mangrove systems that are considered important carbon sinks, especially for their soil which can have high organic concentrations of organic matter. The Food and Agricultural Organization (FAO) defines peat and organic soils as, “...soils that have more than 50% organic matter in the upper 80-cm” . The soil analysis and classification provided by IGAC shows that the soil organic carbon SOC content does not exceed 50% for any soil class in Nuquí which includes the extent of the Los Riscas project area. Moreover, mangrove systems in Colombia that were directly sampled for SOM did not find soil organic matter SOM to be above 50%

1.13.1.3 Topography

Digital elevation data at 100-meter resolution was used to distinguish classes separating coastal areas from inland elevation gradients including the Andean foothills. These classes are 1-100 m, 101-600 m, and >600 m elevation. Shuttle Radar Topography Mission (SRTM) digital elevation data at 30-meter (1 arcsec) resolution was also used in the analysis of radar data and the land cover classification.

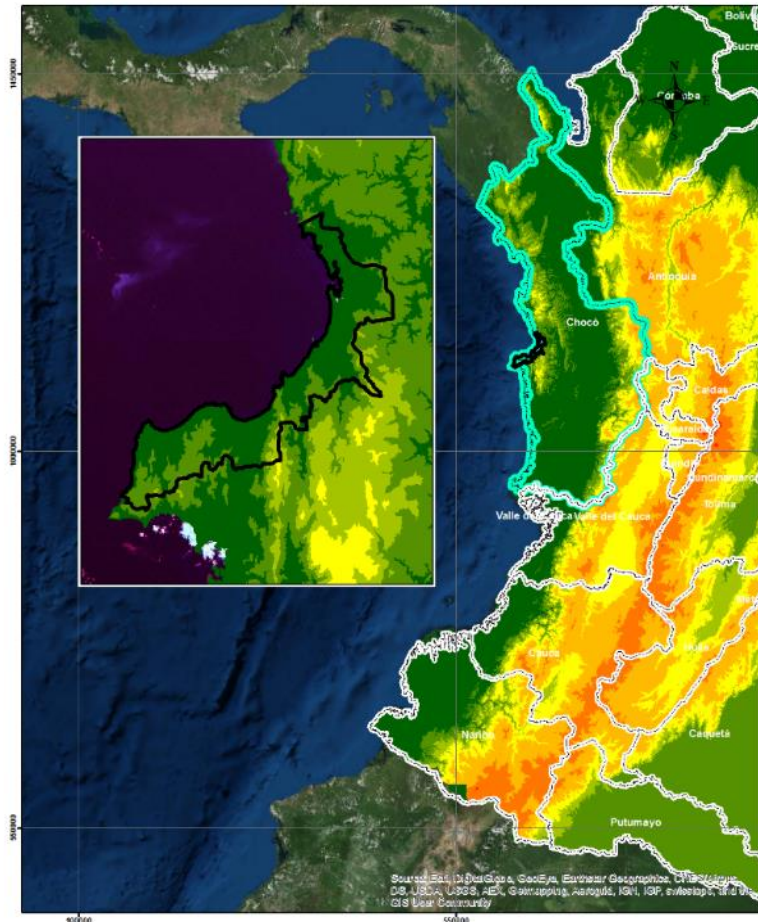


Figure 9. Digital Elevation Map from STRM (90 M RESOLUTION)

1.13.1.4 Climate

The majority of the Colombian Pacific Region, at lower elevations west of the Occidental Cordillera and bordering the coast, is subject to mean annual temperatures > 25 degrees Celsius, generally increasing from south to north at elevations below 1200m. At elevations greater than 2000m to the east in the Occidental Cordillera mean annual temperatures drop to as low as 7 to 15 degrees. Moisture classifications in the region range from humid, to humid and per humid, and super humid (see Annex State of Natural Resources). Precipitation ranges from 3.000mm per year and ranges up to

13.000mm generally increasing from south to north, making the region among those with the most precipitation globally. The project area territory corresponds to tropical wet forest according to Holdridge life zones. The temperature is higher than 24°C and is classified as hot and very humid with a relative humidity between 80% and 90%. Precipitation oscillates between 5.000 and 7.000 mm per year, and the mean precipitation is shown in Figure 10 below.

Analysis for the Riscales Project took climate metrics on rainfall and precipitation from WorldClim, including 11 temperature and 8 precipitation levels at 1 km resolution. Three distinct classes of drier, medium-wet, and wet, were separated to allow stratification of the region based on climate-driven impact on forest cover and its dynamics. The categories are broad but provide distinct zoning significant to forest structure and diversity. Although rainfall in the Chocó bioregion surpasses 8000 mm in some areas there is a large variability along the latitudinal and elevation gradients. Three categories were used to distinguish rainfall levels within the driest sub-regional areas: < 300 mm, 300-600 mm, and >600 mm.

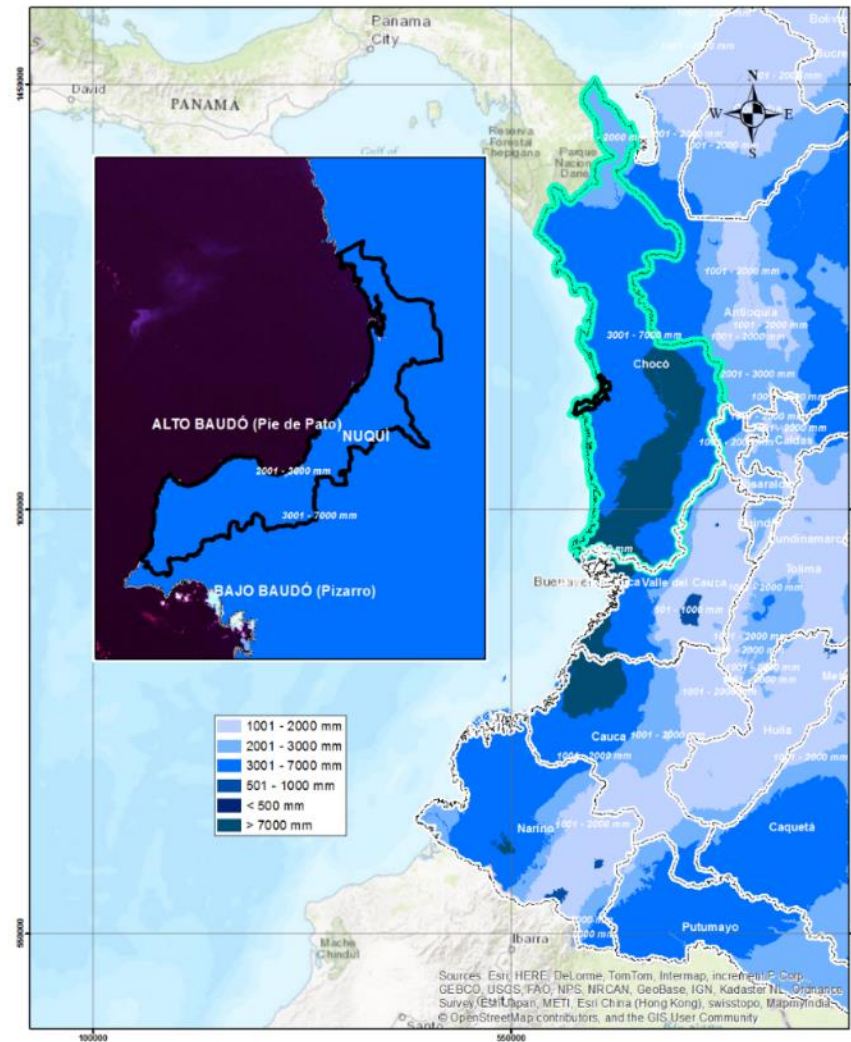


Figure 10. Precipitation levels map (IDEAM 2008).

1.13.1.5 Hydrography

The fluvial system is characterized by the abundance in rivers and streams, resulting from high levels of rainfall. Fluvial dynamics have a direct impact over vegetation, land use, productive activities and communities' livelihoods.

The network of rivers that are in the project area are of independent origin from one another; the main are:

- Arusi river basin: located west of the project area. The source of the river is in the Janano Hill, and flows from south to north, until it flows out into the Pacific Ocean, west of Arusi settlement.
- Arusicito river basin: tributary of the Arusi River. It flows from south to north, receives small streams and has a length of 14 km.

- Quebrada Chicui basin: flows from south to north and has a length of near 8 km.
- Coqui river basin: flows from south to north of the project area towards its mouth in the Pacific Ocean.
- Jovi river basin: flows into the Pacific Ocean near Jovi settlement.
- Panguí river basin: the source of the river is south of the project area, bordering Bajo Baudó municipality. Its mouth is located east of Panguí settlement. A large number of tributaries flow into this river.
- Nuquí river basin: source of the river is south of the project area, bordering Alto Baudó municipality, flowing from south to north and receiving a large number of tributaries. It flows into the ocean in the municipality of Nuquí.
- Tribuga river basin: corresponds to a small stream located east of Tribuga settlement, and its source is situated in the Copidijo Hill.
- Chori river basin: the source of this small stream is located in the hill that separates the project area with Alto Baudó. It flows from east to west.
- Jurubira river basin: its source is located in the Copetepava hill, and flows between hills and small canyons.
- San Pichi river basin: Small River that flows from northeast to southwest.

Table 1. Project Area Rivers. Source: Esquema de Ordenamiento Territorial (2005 – 2016), Alcaldía de Nuquí, IIAP

Third Order	Second Order	First Order
Pacific Ocean	Río Nuquí (Urbana)	Río Ancachy (Urbana)
		Quebrada Marciano
		Quebrada Agua Caliente
		Quebrada Chaquí
		Quebrada Antacorí
		Otras Corrientes Menores
	Río Tribugá	Quebrada El Tigre
		Quebrada Tigrecito
		Quebrada Agua Blanca
		Quebrada Potrero
	Río Panguí	Quebrada Aguafricita
		Quebrada Aguafría
		Quebrada El Chorro
		Quebrada Dominico
		Quebrada Guadual
		Quebrada Guadualito
		Quebrada Dos Boquitas
		Quebrada Dos Bocas
		Quebrada Aguafricita
		Quebrada Munino
		Quebrada Vichiviro
		Quebrada Los Canales
		Quebrada San Juan
		Quebrada Hanoi
		Quebrada Agua El Pan
		Quebrada Himamadó
		Quebrada Taitisal
		Quebrada Cequiel
	Río Chorí	Quebrada Tatabrera
		Quebrada Venado
		Quebrada Mundúquera
		Quebrada El Jagua
		Quebrada Enrique
	Río Jurubirá	Quebrada Dos Bocas
		Quebrada Sierra
		Quebrada Isla
		Quebrada Natal
	Río San Pichi	Quebradas Sin Identificar
	Quebrada Chicui	Quebrada Los Canales
		Quebrada Dos Bocas
	Río Arusicito	Quebradas Sin Identificar

	Río Arusí	Quebrada Aguaclara
		Quebrada Aguaclarita
		Quebrada Cañada Mala
	Río Coquí	Quebrada Veneno
		Quebrada Galván
		Quebrada Llano
		Quebrada El Bongo
		Quebrada Barbudera
		Quebrada Aguaclara
	Río Joví	Quebrada Aguacate
		Quebrada Antanol
		Quebrada Saltico
		Quebrada Chontaduras
		Quebrada Las Tatabreras
		Quebrada El Viejo
		Quebrada Las Cocas
		Quebrada Aguacatico
		Quebrada Sonora
		Quebrada Chorrillo

1.13.2 Vegetation and Forest types

A notable diversity of forest vegetation types occurs in the Colombian Pacific Region. Distinctions between vegetation types arise from many of the climate and soil related variation as described in Section 1.9 In their year 2000 report on ecological zoning with the Colombian Pacific Region, the Colombian Ministry of Environment and Instituto Geografico Agustin Codazzi describes vegetation cover types based on methodologies developed by United Nations Educational, Scientific and Cultural Organization (UNESCO) (See Annex - Ecological mapping report). These include five categories of Andean, Sub-Andean, and Shrub Forest growing at higher elevations in the Pacific region. While many vegetation type distinctions correspond to elevation, others are non-zonal distinctions due to extremes in localized factors such as soil types and moisture regimes. These include mangrove forests as noted in detail further below.

At lower elevations, in proximity to the coast are another eight forest types. These include Low Altitude and Low Mountain Forests within which four distinctions occur based on species and structural characteristics. Also, present are Mangrove Forest and Shrub Mangrove, occurring in tidal areas along coastal inlets and shorelines sheltered from heavy waves and where only halophytic shrubs and trees grow due to periodic saltwater flooding; Alluvial forests with the presence of palms and heavy undergrowth;

and, Alluvial Forests within marshland along the Atrato River. There are several non-forest, shrub and herbaceous vegetation types present in the region.

The leading vegetation type within the project area is forest and mangroves having about 70% of land cover classes. (Figure 11).

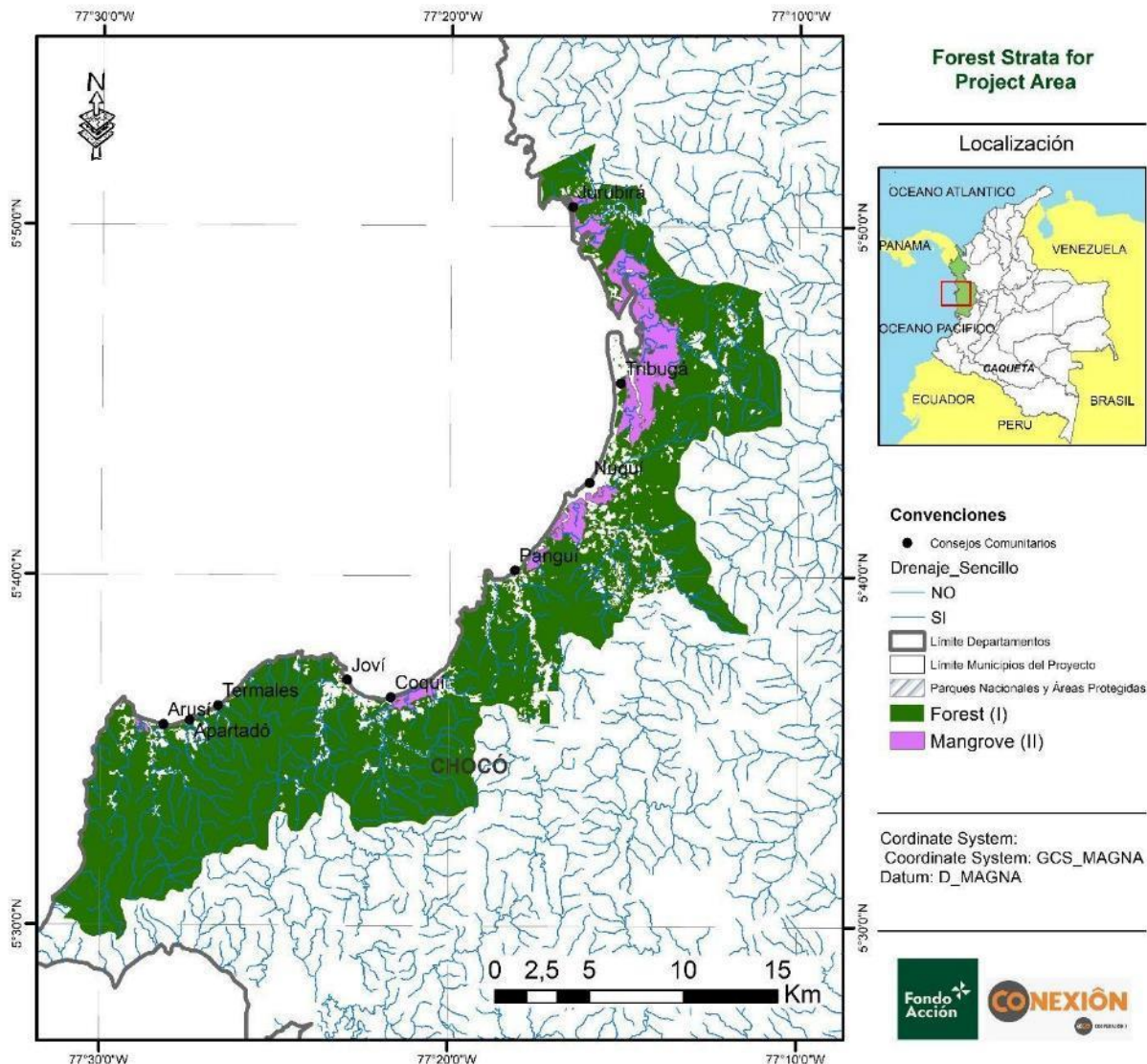


Figure 11. Types of vegetation

Plant species are incredibly diverse as reflected by Colombia's ranking in second place globally for biodiversity, and the 5,125 plant species documented to occur in the Colombian Pacific Region (See Annex - Report on state of natural resources). While inventory and documentation of vegetation in the project zone is far from exhaustive to date, biodiversity plots have been established by the Humboldt Institute to increase

knowledge of plant species relevant to the project zone and the Colombian Coastal Region. Some commonly encountered plant species in the area as documented in forest management plans for the project area are listed in Table 2. Further documentation of plant species in the project area is kept on file and will continue to expand as a component of project activities.

Table 2. Common Plant Species in the Project Zone. Source: Ethno-Development Plan 2007-2020, Community of Riscales

Common Name	Scientific Name	Common Name	Scientific Name
Edible plant species (fruits or leaves)		Used for construction or artisanal	
Memé, Inkidí	<i>Wettinia cf. quinaria</i>	Memé, Inkidí	<i>Wettinia cf. quinaria</i>
Táparo, Tapará	<i>Attalea cf. amygdalina</i>	Palma mona	<i>Welfia sp</i>
Hoja e tuga	<i>Calathea sp. 1</i>	Dompedito	<i>Oenocarpus cf. mapora</i>
Mil pesos, Urutá	<i>Oenocarpus bataua</i>	Palma zancona	<i>Sacate cf. exorrhiza</i>
Guamo churimo	<i>Inga sp. 1</i>	Matamba	<i>Smilax cf. floribunda</i>
Santa Ma. de Anís	<i>Piper cf. anisatum</i>	Barrigona	<i>Iriarte aff. deltoidea</i>
Zapote	<i>Matisia cordata</i>	Tejemó	<i>Calathea sp.2</i>
Naidí, Murrapo	<i>Euterpe Oleracea</i>	Calabazo o Mate	<i>Werregue</i>
Caimo	<i>Micropholis spp.</i>	Troza	<i>Heliconia sp.</i>
Anime	<i>Protium nervosum</i>	Potre	<i>Thoracocarpus bisectus</i>
Caimito	<i>Puteria sp</i>	Sande	<i>Brosimum utile</i>
Güino	<i>Carapa guianensis</i>	Güino	<i>Carapa guianensis</i>
Choibá, almendro	<i>Dipteryx oleifera</i>	Chunga	<i>Astrocaryum standleyanum</i>
Ornamentals		Karate	<i>Stenospermation sp.</i>
Amargosa	<i>Peperomia pernambucensis</i>	Iraca	<i>Carludovica palmata</i>
Memé, Inkidí	<i>Wettinia aff. Quinaria</i>	Quema karate	<i>Philodendron sp.2</i>
Palma mona	<i>Welfia sp.</i>	Otobo, Cuangare	<i>Otoba sp.</i>
Táparp	<i>Attalea cf. Amigdalinum</i>	Laurel	<i>Nectandra sp.</i>
Dompedito	<i>Oenocarpus cf. Mapoa</i>	Aceite María	<i>Calophyllum mariae</i>
Guasco	<i>Lecythis sp.</i>	Algarrobo	<i>Hymenaea courbaril</i>
Guabo, Guaba	<i>Inga sp.</i>	Chachajo, comino crespo	<i>Aniba sp.</i>
Carbonero	<i>Licania sp.</i>	Jigua negro	<i>Ocotea sp</i>
Esalero	<i>Lecythis sp.</i>	Palma marfil, tagua	<i>Phytelephas seemannii</i>
Tachuelo	<i>Zanthoxylum sp.</i>	Cabecita	<i>Manicaria saccifera</i>
Okendo	<i>Brosimum guianense</i>	Guaite	<i>Wettinia sp</i>

Common mangrove species includes the nato mangrove (*Mora oleifera*), attains 35 meters or greater in height and is listed as vulnerable according to the International Union for Conservation of Nature and Natural Resources (IUCN). Moreover, the Red Mangrove grows more than 26 meters in height and it is listed as least concerned by the Red list of IUCN. In the case of black mangrove, it is also catalogued as least concerned (IUCN), it grows at elevation slightly higher than the Red Mangrove, reaching heights over 23 meters. On the other hand, the White Mangrove compared with the Red Mangrove and black mangrove, is a small tree with heights of 15 meters; according to the IUCN is listed as least concerned species.

In regards the buttonwood (*Conocarpus erecta*) is often associated with mangrove communities; while the three mangrove species have leaves that occur opposite of each other, the buttonwood leaves alternate. The Piñuelo Mangrove is a native species of Pacific Coast, its height is over 15m and its roots are approximately one meter in height, and covered with lenticels of white-brown color. The Injerto Mangrove reaches a size of up to 20 m high, and has characteristic elliptic leaves. Finally, the Comedero Mangrove (*Languncularia racemosa*) grows to 12–18 meters, its bark is gray-brown or reddish, as well as rough and fissured.

Table 3. Most common mangrove species in the project zone. Source: Ethno-Development Plan 2007-2020, Community of Riscales

Common Name	Scientific Name	Common Name	Scientific Name
Mangle comedero	<i>Languncularia racemosa</i>	Mangle rojo	<i>Rhizophora mangle</i>
Mangle blanco	<i>Rhizophora aff. Brevistylosa</i>	Mangle injerto	<i>Rhizophora harrisonii</i>
Mangle feliz/negro	<i>Avicennia germinans</i>	Mangle piñuelo	<i>Pellicierarhizophorae</i>
Mangle nato	<i>Mora oleifera</i>	Mangle iguanero/botón	<i>Conocarpus erecta</i>

Deforestation resulting primarily from commercial timber harvest over a period of more than 60 years has led to structural conditions dominated by young forests with small diameter trees in varied successional states. Despite these pressures the resilience of these ecosystems is evidenced through an abundance of natural regeneration, however, unsustainable exploitation has continued to severely affect structural attributes (e.g. age, and height, diameter and density, crown closure, etc.) and deforestation reduces connectivity between existing forest patches. It is estimated

that, left to recover naturally, these forests are able to return to a state approximating natural conditions within 15 years.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project proponents are committed to complying with all applicable laws, statutes, property rights and other regulatory frameworks. The extensive stakeholder participatory process will ensure that compliance is achieved.

General applicable laws and justification of fulfillment

An analysis was made of the legal framework that enables the Riscales community to develop governance actions about its territorial areas (See Annex 11 General applicable laws_fulfillment justification). The first part are the dispositions emanated by the Colombian constitution. Therefore, of areas delimitation respecting the laws about forest national reserves (Law 02 of 1959) of natural parks and established special management districts for the National Protected Areas System (NPAS). Among others, the project promulgates the actions that allow the implementation of the Convention on Biological Diversity (CBD) in its component: Mitigate the factors that determined biodiversity deterioration by combining a range of actions such as: (i) the reduction of processes and activities that contribute to the transformation, fragmentation and degradation of ecosystems, though the application of environmental licenses within the framework of land-use planning processes

Regarding environmental regulations, the project has been adjusted to the requisites of the law, with special emphasis on those related to payment for environmental services, functioning of the National Climate Change System and the national registry for GHG emission reduction projects (See MADS regulations for registration of projects: <http://www.minambiente.gov.co/index.php/tramites-minambiente/registro-redd-programas-y-proyectos-iniciativas-redd#links-de-acceso-al-tr%C3%A1mite>).

In order for the mitigation results of the project to be subject to national accounting, it recognizes and is governed in its phases of formulation and implementation, by the guidelines of Resolution 1447 of 2018 of the Ministry of Environment and Sustainable Development, regarding the articulation with the Monitoring, Reporting and Verification System of mitigation actions at the national level and the registration of the initiative in the National Registry of Programs and Projects of actions for the Reduction of emissions due to the Deforestation and Forest Degradation of Colombia RENARE³.

³ The project will be registered once RENARE becomes operational.

Project articulation with national laws, statutes and other regulatory frameworks implies to have knowledge of the rules supporting the steps to analyze, formulate, and implement the Colombian regulatory framework regarding climate change issues and REDD+ projects.

- Political Constitution of Colombia, Articles 2, 13, 20, 38, and 80.
- Political Constitution of Colombia Articles 63 y 330
- Law 70 of 1973, Article 6 (Community Councils) are recognized with "The right of the black communities as a whole to possess and occupy their ancestral lands" and direct the uses of the land. Specifically, the communal lands of ethnic groups are "inalienable, imprescriptible and unattachable". The resolutions from INCORA (Instituto Colombiano de la Reforma Agraria), (next INCODER and currently ANT Agencia Nacional de Tierras, highest land authority in Colombia), establishes the following for each of the Community Councils: Resolution 002206 of December 4, 2002 by means of which the vacant lots occupied collectively by the Organized Afro Community in the GENERAL COMMUNITY COUNCIL OF THE NUQUÍ LOS RISCALES MUNICIPALITY, located in the municipality of Nuquí in the department of Chocó, are adjudicated as "Afro community lands".
- Decree Law 2811 of 1975, whereby the National Code of Renewable Natural Resources and Protection of the Environment is issued.
- Law 99 of 1993 – whereby the Ministry of Environment and the National Environment System (SINA) are created.
- Decree 1791 of 1996 – Forestry Exploitation Regime.
- CONPES 2834 of 1999 – whereby the Forest Policy is adopted.
- Law 388 of 1997 –Law 9^a of 1989 and Law 3^a of 1991 are modified, and other provisions on land-use planning are issued.
- CONPES 3700 of 2011. Institutional Strategy for the Articulation of Policies and Actions on Climate Change in Colombia. It creates an Interdisciplinary REDD+ Working Group, as an instance to support the development of REDD+;
- Decree 3750 of 2033 – whereby the goals and structure of the Ministry of Environment and Sustainable Development are modified, and the Administrative Sector of Environment and Sustainable Development is integrated.
- Decree 2372 of 2010 – It regulates the National System of Protected Areas.

- Decree 298 of 2016 – Whereby the organization and operation of the Climate Change National System are established, and other provisions are issued.
- Law 1819 of 2016. Structural Tax Reform. It pursues to reduce polluting emissions from the burning of fossil fuels by implementing economic instruments that make it easier to reach the goals set forth in the Paris Agreement (Article 221). The tax consists in paying a fee related to the carbon content produced by the national industrial activity. The fuels subject to this tax are gasoline, kerosene, jet fuel, diesel fuel, and fuel oil, provided they are used for combustion. Natural gas is also taxed, but also to be used in the hydrocarbon refining and petrochemical industries, and liquid petroleum gas (LPG) for sell to industrial users.
- Decree 298 of 2016 - Whereby the organization and operation of the Climate Change National System (SISCLIMA) are established, and other provisions are issued.
- Law 1844 of 2017 – Whereby the Paris Agreement is approved. As Colombia is a country especially vulnerable to the impacts of climate change, measures for action are established.
- Decree 926 of 2017. No causation of the National Carbon Tax. Whereby the procedure to encourage the implementation of major mitigation initiatives is established to activate the carbon credit market and to promote the implementation of GHG projects.
- Decree 1655 of 2017. Forest Information National System. Whereby, new five sections are added to Book 2, part 2, title 8, chapter 9 of Decree 1076 of 2015, that establish the organization and operation of the Forest Information National System, the National Forest Inventory, and the Forest and Carbon Monitoring System, which make part of the Environmental Information System for Colombia, and other provisions are issued.
- Decree 1257 of 2017 – Whereby the Intersectoral Commission for Deforestation Control and Comprehensive Management to Protect Natural Forests is created, and other decisions are made.
- Decree 870 of 2017. Payment for environmental services. Whereby the payment for environmental services and other incentives for conservation are established.
- Law 1931 of July 27, 2018. Climate Change Law. Whereby guidelines to manage climate change are established, stating that information from the Forest and

Carbon Monitoring System (SMBYC) prepared by IDEAM, as well as the Forest Emissions Reference Levels will be employed, and they will serve as model for the implementation of REDD+ initiatives.

- Article 230, National Development Plan, 2022-2026. Congress of Colombia. This article determines the modification of Article 175 of Law 1753 of 2015. In its paragraph 2, it defines among others...

- “..Owners of GHG emission reduction initiatives shall comply with environmental, social and economic rules and, in the case of GHG emission reduction initiatives in the Agriculture, Forestry and Other Land Use (AFOLU) sector, with the social and environmental safeguards defined by the United Nations Framework Convention on Climate Change (UNFCCC) and adopted by the country through its National Interpretation of Social and Environmental Safeguards, Comply with the social and environmental safeguards as defined by the United Nations Framework Convention on Climate Change (UNFCCC) and adopted by the country through its National Interpretation of Social and Environmental Safeguards, including free, prior and informed consultation, where appropriate, if the project involves areas with the presence of indigenous communities, Black, Afro-Colombian, Raizal and Palenquero communities...”

The PP has submitted this request to the Ministry of the Interior, Directorate of Affairs for Black, Afro-Colombian, Raizal and Palenquero Communities, to start the process according to the guidelines established by the Ministry (see below). This response is still awaited.



2 de noviembre, 2023

Asociación de Consejo Comunitario General Los Riscales

Cabecera urbana

Nuquí, Colombia

nelferval2@gmail.com

Ministerio del Interior de Colombia

Dirección de Asuntos para Comunidades Negras, Afrocolombianas, Raizales y Palenqueras

Carrera 8 No. 7 - 83

Bogotá, Colombia

Asunto: Solicitud del procedimiento para la implementación del párrafo 2 del artículo 230 de la Ley 274 de 2023- Plan de desarrollo 2022-2026 "Colombia Potencia Mundial de la Vida"- para el Proyecto REDD+ Los Riscales de índole netamente comunitario.

Estimada dirección,

Por medio de la presente, la Asociación de Consejo Comunitario General Los Riscales a través de su representante legal Nelfer Valoyes Angulo con cédula número 4.846.757 solicita de manera atenta el procedimiento asociado para la implementación párrafo 2 del artículo 230 de la Ley 274 de 2023- Plan de desarrollo 2022-2026 "Colombia Potencia Mundial de la Vida"- para el Proyecto REDD+ Los Riscales, ubicado en el departamento de Nuquí y que cuenta con ID 1806 en el registro de proyectos del VERRA.

Citamos aquí el párrafo: *PARÁGRAFO 2°. Los titulares de las iniciativas de mitigación de gases de efecto invernadero deberán cumplir lo previsto en la normativa en materia ambiental, social y económica y, para el caso de las iniciativas de mitigación de gases de efecto invernadero del sector Agricultura, Silvicultura y Otros Usos del Suelo -AFOLU, cumplir las salvaguardas sociales y ambientales definidas por la Convención Marco de las Naciones Unidas para el Cambio Climático -CMNUCC, y adoptadas por el país a través de su Interpretación Nacional de Salvaguardas Sociales y Ambientales, incluida la consulta previa libre e informada de ser procedente, cuando el proyecto verse sobre áreas con presencia de comunidades indígenas, comunidades negras, afrocolombianas, raizales y palenqueras, y las demás herramientas, condiciones, criterios y requisitos que sean definidos en el marco del Sistema Nacional de Salvaguardas. Todas las iniciativas de*

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has not been registered, nor is it seeking registration under any other GHG program.

The Colombian government has developed only one programme initiative related to greenhouse gas emissions in the country, called Visión Amazonia, which consists of a payment for results programme for reducing deforestation in the Colombian Amazon⁴.

The current project proposal, as detailed above, is located in the Colombian Pacific Zone and therefore does not form part of this unique national initiative or any other initiative that could generate carbon incentives in the AFOLU sector.

⁴ <https://visionamazonia.minambiente.gov.co/que-es-vision-amazonia/>

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG program.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading?

☐ Yes

☒ No

1.16.2 Other Forms of Environmental Credit

The project has not requested or received another form of environmental credit related to GHG.

Only in the AFOLU sector and specifically for the Los Riscales REDD+ project have emission reductions been managed in the proposed project area.

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

☐ Yes

☒ No

1.16.3 Supply Chain (Scope 3) Emissions

N/A

1.17 Sustainable Development Contributions

1.17.1 Sustainable Development Contributions Activity Description

The Sustainable Development Goals (SDGs) are framed in the universal call for the adoption of measures to end poverty, protect the planet and to ensure that all people enjoy peace and prosperity. Based on these guidelines, Colombia adopts 17 objectives to achieve the goals of the SDGs. The SDGs embroider the root causes of poverty and unite us to achieve positive change for the benefit of people. Based on these principles, the fundamental pillars of the SDG for the country since 2016 focus on quality education (4), reduction of inequalities (10), and peace, justice and solid institutions (16), all as stated in the National Development Plan (UNDP 2016).

The REDD+ project is concentrated in one of the country's territories with the greatest deficiencies in infrastructure, education, health and social assistance. The Colombian Pacific Corridor is also defined as one of the five places in the country with the greatest vulnerability to climate change. In the chapter entitled, "Producing and Conserving While Producing", of the National Development Plan, the recognition of the key role played by ethnic communities in the conservation of natural capital has been highlighted. REDD + projects can contribute to further these goals by generating

economic alternatives and incentives that improve living conditions yet maintain ancestral customs aligned with the conservation of natural resources. Activities implemented during the years under the auspices of the REDD + project have and will continue to be in line with capacity building for communities and for instances of increased territorial governance, which will allow them to reduce deforestation and environmental degradation, as well as help with the management of climate change and disaster risks (PND, 2018-2022).

The REDD + project Los Riscasles, from its conception and implementation, has been harmonized with the objectives that contribute to a Colombia in Peace by strengthening the governance of its territories, implementing productive alternatives and through the diversification of income that can be provided from the protection of forests.

These actions will contribute to the goals of reduction of greenhouse gas emissions established in international agreements, to the goals of reducing deforestation in general, and will be linked to the economic policies of future tax reforms related to carbon taxes and pollution, carbon neutrality, and for providing reduced carbon emission units to industrial sectors with carbon tax compliance obligations.

The REDD+ project contributes significantly to the achievement of Sustainable Development Goal 1: No Poverty through a series of integrated actions that address various dimensions of poverty. These contributions focus on economic, social and environmental aspects, seeking to eradicate poverty in a sustainable manner in the communities involved.

Employment generation and opportunities in environmental services and green markets: The project facilitates the creation of employment alternatives by involving the community in mangrove restoration programs and the development of value chains in the agricultural and forestry sectors. These initiatives open up stable job opportunities aligned with environmental conservation, thus strengthening the economic security of local residents. Indicators for monitoring progress can be found in the project's theory of change matrices.

Protection and sustainable management of ecosystems: Within the “Ecosystems and use spaces” component, the REDD+ project ensures that local communities can sustainably access essential natural resources, securing resilient livelihoods and reducing their economic vulnerability. Sustainable ecosystem management allows the environmental services generated to contribute to the long-term financial security of communities.

Promoting traditional production practices: The project promotes sustainable traditional production practices, integrating ancestral knowledge into modern markets. This initiative not only improves food security, but also increases the communities' income, allowing them to participate in a strengthened local economy that is less dependent on external sources, without compromising their cultural identity.

Investment in ethno-education and human capital development: The project invests in education adapted to local cultural contexts, which strengthens the communities' human capital. This approach provides equal opportunities and equips young people with relevant skills and knowledge, enabling them to generate income in a sustainable manner, thus breaking the cycle of poverty.

Together, these activities not only promote environmental conservation, but also foster the socioeconomic development of vulnerable communities. By addressing the multiple dimensions of poverty - economic, educational and environmental - the REDD+ project contributes comprehensively to poverty eradication, helping communities to improve their well-being and strengthen their resilience to future challenges.

The project contributes to Sustainable Development Goal 2: Zero Hunger through various activities that promote food security, sustainability in food production and reduction of external dependency in communities.

Promotion of sustainable agricultural practices: The project has worked with community producers to implement sustainable agricultural practices, providing participants with equitable access to technologies that improve production and facilitate access to better markets, as in the case of fisheries. These initiatives help increase productivity and efficiency in food distribution.

Promoting traditional production systems and economic activities: Through production systems that integrate family farming and ancestral knowledge, the project boosts food security by promoting crop diversity and the conservation of natural resources. This approach enables communities to have consistent access to nutritious food, reducing vulnerability to malnutrition and increasing their resilience.

Ethno-education and knowledge transfer: The initiative has also invested in ethno-education programs, with a focus on child and youth protection. The transmission of knowledge on food production and sustainable resource management strengthens local capacities, ensuring that communities can ensure their food security and reduce their dependence on external sources.

Together, these REDD+ project activities not only contribute to food and nutrition security, but also promote greater resilience to climate change by addressing the

causes of food insecurity and malnutrition. This holistic approach ensures a positive and sustainable impact in the fight against hunger, supporting communities on their path to secure and stable food.

The REDD+ project contributes to Sustainable Development Goal 4: Quality Education, ensuring inclusive, equitable and quality education and promoting lifelong learning opportunities for all. Project activities that support this objective are detailed below:

Training on forest use and relationship to REDD+: The project has conducted a training workshop on forest use and its relationship to REDD+, in collaboration with the National Learning Service (SENA). This training is essential to raise awareness of the value of forest resources and how to manage them sustainably, thus promoting quality education on environmental issues.

Forest and Climate Negotiation Training Modules: Ten forest and climate negotiation training modules have been implemented. These modules strengthen negotiation skills and provide participants with key sustainability knowledge, facilitating a deeper understanding of the relationship between climate and forest resources.

Harvesting protocol for non-timber wild flora: As part of the educational activities, a harvesting protocol has been developed for non-timber wild flora, specifically in vanilla cultivation. This protocol helps communities to manage their natural resources in a sustainable manner, providing a practical and technical component to their training.

Strengthening the organizational process, governance and peace-building: These activities foster civic education, promoting the informed and active participation of youth and adults in community life. By creating safe and conducive learning environments, they contribute to reducing violence, harassment and conflict in educational spaces, which is essential for providing quality education. In addition, the focus on educational governance fosters inclusive policies that facilitate equitable access to education, helping to reduce gender and socioeconomic disparities.

These REDD+ project initiatives create a context in which education is more accessible, equitable and of quality, promoting holistic development and lifelong learning in the beneficiary communities.

The project contributes significantly to Sustainable Development Goal 5: Gender Equality, which seeks to achieve gender equality and empower all women and girls. Project activities that support this goal are described below:

Women's participation in decision making: The active participation of women in decision making and in project workshops has been favourable, allowing them to play an important role in the implementation of REDD+ Project activities. This process

reinforces their empowerment and the recognition of their leadership within the community.

Organization of women in ecotourism and non-timber harvesting: Specific activities have been promoted, such as ecotourism and non-timber product harvesting, in which women are actively involved. These activities provide them with employment and personal development opportunities, in addition to strengthening their roles in the local economy.

Organizational strengthening, governance and peace-building: Organizational strengthening and governance activities create inclusive spaces in which women can actively participate in decision-making, peace-building and conflict resolution processes. This helps address gender dynamics that perpetuate inequality, promoting a more equitable environment and enabling other women and girls to be inspired by the leadership roles they assume.

Inclusive management of ecosystems and use spaces: The project ensures that men and women have equal access to natural resource management. Involving women in this management not only empowers them, but also respects their traditional role as guardians of the environment, giving them greater influence and autonomy in the preservation of ecosystems.

Traditional production systems and economic activities: By promoting inclusive productive practices that involve women, the project contributes to their economic autonomy. This improves their income and strengthens their role in the local economy, benefiting both their families and the community at large by recognizing and valuing their economic contribution.

Health and ethnomedicine: Initiatives that integrate health and ethnomedicine address the specific needs of women, improving their overall well-being and their ability to participate actively in society. In addition, by training women in the use of ethnomedicines and indigenous health practices, the project strengthens their role in the health care of their families and in the community.

Together, these REDD+ project activities promote gender equality by empowering women in various spheres, improving their access to resources and opportunities, recognizing their work, and ensuring that their voices and needs are a fundamental part of decision-making in their communities and beyond.

The REDD+ project contributes significantly to Sustainable Development Goal 8: Decent Work and Economic Growth, which aims to promote sustained, inclusive and sustainable economic growth, as well as full and productive employment and decent work for all. The following details how project activities support this objective:

Employment opportunities and fulfillment of labor rights: the REDD+ project provides community members with access to service contract positions, where they can enhance their technical skills through activities developed for the project. All contracts comply with Colombian regulations, respecting labor, social and occupational health rights, thus ensuring decent and safe working conditions.

Strengthening the organizational process, governance and peace-building: Strengthening community organization and governance promotes an inclusive environment for decision-making and policy development focused on employment and economic growth. Empowering the community to actively participate in these processes reinforces economic development strategies that are sustainable and relevant to the local context. In addition, peacebuilding contributes to political and social stability, key factors for attracting investment, fostering economic growth and creating employment opportunities.

Ethno-education and support for children and youth: Ethno-education, which integrates local culture into the educational process, expands employment opportunities for young people, who acquire skills and knowledge relevant to their communities. This not only contributes to building a skilled future workforce, but also promotes entrepreneurship and innovation, both of which are essential for sustainable economic growth. Ensuring access to education for children and youth provides communities with a strong base of skilled individuals who can actively contribute to the labor market.

Taken together, these REDD+ project activities are critical to achieving SDG 8, as they drive inclusive and sustainable economic growth, foster the creation of quality jobs, and strengthen the infrastructure and resilience of communities. This ensures that all community members have equitable opportunities and a fair distribution of economic benefits.

The REDD+ project contributes significantly to Sustainable Development Goal 13: Climate Action, which aims to promote urgent action to combat climate change and its effects. The project activities detailed below are essential to implement effective and sustainable strategies to address climate change:

Reducing deforestation and GHG emissions: Through the reduction of deforestation and greenhouse gas (GHG) emissions in the forests of the Colombian Pacific, the REDD+ project advances the validation and verification of these mechanisms, contributing directly to climate change mitigation.

Ecosystems and use spaces: Proper management of ecosystems such as forests and wetlands acts as a powerful mitigation mechanism, as these natural spaces function as carbon sinks, capturing CO₂ and reducing its concentration in the atmosphere.

Biodiversity conservation strengthens these ecosystems, improving their GHG absorption capacity, which is essential to meet emission reduction targets and maintain climate stability. Sustainable use of natural resources also helps local communities to better adapt to environmental changes, strengthening their resilience and protecting their livelihoods in the long term.

Traditional production systems and economic activities: Integrating traditional and sustainable practices into production systems reduces the carbon footprint of economic activities and supports the creation of resilient, low-carbon local economies. These practices, developed by communities over time, are not only environmentally friendly, but also decrease reliance on carbon-intensive methods. Moreover, by promoting circular economy models based on ancestral knowledge, green jobs are generated and local economies are strengthened, contributing to both climate change mitigation and ecosystem conservation.

Ethno-education and protection of children and youth: Ethno-education fosters environmental awareness in new generations, teaching sustainable practices and highlighting the importance of conservation. This translates into concrete actions to mitigate and adapt to climate change. By educating children and youth on environmental protection, the foundation is laid for future generations to engage in climate action. In addition, it is crucial to protect children and youth from the effects of climate change, as they are particularly vulnerable. Their well-being and education on these issues strengthen a more resilient and prepared society.

Climate change and risk management: Risk management focused on reducing community vulnerability to extreme weather events strengthens community resilience and fosters adaptation to climate change. By implementing adaptation and mitigation strategies, communities are better prepared to cope with natural disasters, protecting lives and livelihoods. Including local knowledge and community experience in these management plans is fundamental for effective adaptation and strengthens the capacity of communities to address climate challenges in a sustainable manner.

Together, these actions not only contribute to mitigating climate change by reducing GHG emissions, but also support adaptation and increase community resilience, contributing directly to SDG 13: Climate Action.

1.17.2 Sustainable Development Contributions Activity Monitoring

Table 4. Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	1.4	Number of community members with strengthened capacity for natural resource management and environmental monitoring	Implemented activities to increase	(10) Ten community members have strengthened their capacity for natural resource management and environmental monitoring, which contributes to equal rights to economic resources and increases the resilience of vulnerable people.	80 community members have strengthened their capacity for natural resource management and environmental monitoring, which contributes to equal rights to economic resources and increases the resilience of vulnerable people.
2)	1.a	Number of funding mechanism established to finance the community REDD+ project	Implemented activities to increase	(1) One funding trust was established to finance the community REDD+ project as a result of funding searches and lobbying (Annex. 62)	One funding trust was established to finance the community REDD+ project as a result of funding searches and lobbying (Annex. 62)

3)	2.4	Number of community members increase their sustainable food production and help maintain ecosystems	Implemented activities to increase	64 community members increase their sustainable food production and help maintain ecosystems (benefited from stoves and vegetable gardens only 20 were registered).	200 people increased their sustainable food production and help maintain ecosystems
4)	4.7	Number of people that acquire knowledge and skills to promote sustainable development and climate change adaptation and mitigation	Implemented activities to increase	100 local leaders trained in forestry and climate change	200 people trained to promote sustainable development and climate change adaptation and mitigation
5)	5.5	Number of studies related to gender related to environmental, productivity and climate change aspects.	Implemented activities to increase	1 study examines the perspectives of women regarding the potential construction of the Deep Water Port in the Gulf of Tribugá	5 studies to examines gender perspective for an effective participation and equal opportunities for leadership at all levels of decision-making in relation to environmental, productivity and climate change.
6)	13.b	Nubmer of tones of greenhouse gas emissions avoided or removed		First monitoring 432.223 tCO ₂ .	

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	1.4	Number of community members with strengthened capacity for natural resource management and environmental monitoring	Implemented activities to increase	(10) Ten community members have strengthened their capacity for natural resource management and environmental monitoring, which contributes to equal rights to economic resources and increases the resilience of vulnerable people.	80 community members have strengthened their capacity for natural resource management and environmental monitoring, which contributes to equal rights to economic resources and increases the resilience of vulnerable people.
2)	1.a	Number of funding mechanism established to finance the community REDD+ project	Implemented activities to increase	(1) One funding trust was established to finance the community REDD+ project as a result of funding searches and lobbying (Annex. 62)	One funding trust was established to finance the community REDD+ project as a result of funding searches and lobbying (Annex. 62)

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1)	1.4	Number of community members with strengthened capacity for natural resource management and environmental monitoring	Implemented activities to increase	(10) Ten community members have strengthened their capacity for natural resource management and environmental monitoring, which contributes to equal rights to economic resources and increases the resilience of vulnerable people.	80 community members have strengthened their capacity for natural resource management and environmental monitoring, which contributes to equal rights to economic resources and increases the resilience of vulnerable people.
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5)	5.5	Number of studies related to gender related to environmental, productivity and climate change aspects.	Implemented activities to increase	1 study examines the perspectives of women regarding the potential construction of the Deep Water Port in the Gulf of Tribugá	5 studies to examines gender perspective for an effective participation and equal opportunities for leadership at all levels of decision-making in relation to environmental, productivity and climate change.
6)	13.b	Nubmer of tones of greenhouse gas emissions avoided or removed		First monitoring 432.223 tCO ₂ .	

1.18 Additional Information Relevant to the Project

Leakage Management

Preliminary Leakage Management Plan

Objective

To mitigate carbon leakage through the implementation of preventive and operational strategies that promote project sustainability, minimize the impacts of deforestation in outside areas, and strengthen governance and alternative livelihoods for local communities.

Operational Leakage Mitigation Measures	Goals	Indicators
1. Strengthening Governance and Capacity Building Operational Measure: - Train community members on sustainable resource management and territorial protection under the guidelines of the Plan de Manejo de los Manglares del Golfo de Tribugá. - Collaborate with the Consejo Comunitario General Los Riscales to enforce the plan's zoning and resource use regulations.	- Train representatives of the Consejo Comunitario General Los Riscales and local community members in sustainable resource management and conservation practices. - Organize and conduct participatory assemblies with the Consejo Comunitario General Los Riscales to review and reinforce governance strategies.	- Number of workshops conducted and participants trained. - Number of participatory assemblies held with the Consejo Comunitario.
2. Participatory Zoning Operational Measure: - Implement the zoning defined in the Plan de Manejo de los Manglares del Golfo de Tribugá, dividing the territory into sustainable use, recovery, and preservation zones. - Establish and communicate clear regulations for each zone to guide sustainable practices and prevent	- Georeference additional areas as recovery and preservation zones. - Ensure sustainable use zones are actively monitored for compliance with established regulations.	- Hectares georeferenced and zoned as recovery or preservation areas. - Percentage of sustainable use zones under active monitoring.

Operational Leakage Mitigation Measures	Goals	Indicators
unauthorized activities.		
3. Promoting Sustainable Productive Alternatives Operational Measure: - Expand alternative livelihood initiatives such as agroforestry, sustainable fishing, and non-timber product value chains (e.g., vanilla and acai). - Enhance the "La Cumbancha" ecotourism circuit to diversify income opportunities.	- Engage additional families in agroforestry and alternative livelihoods. - Increase the number of visitors to "La Cumbancha".	- Number of families engaged in sustainable livelihood programs. - Number of visitors and revenue generated through ecotourism initiatives.
4. Reducing Firewood Dependency Operational Measure: - Install additional eco-efficient stoves in communities to reduce firewood use. - Train families in the proper use and maintenance of eco-efficient stoves to ensure long-term adoption.	- Install new eco-efficient stoves. - Achieve a reduction in firewood consumption in targeted communities.	- Number of eco-efficient stoves installed. - Percentage reduction in firewood consumption per household.
5. Community Monitoring and Surveillance Operational Measure: - Form community patrol teams to monitor areas at risk of leakage and enforce compliance with zoning regulations. - Use satellite imagery to identify deforestation hotspots and guide intervention efforts.	- Conduct community patrols annually in high-risk areas. - Reduce deforestation rates in leakage-prone areas.	- Number of patrols conducted and reports generated. - Percentage reduction in deforestation rates in monitored areas.
6. Mangrove Recovery and Reforestation Operational Measure: - Reforest degraded mangrove areas using seeds collected by local communities. - Collaborate with environmental authorities to	- Reforest hectares of mangroves. - Involve communities in mangrove restoration and management activities.	- Hectares of mangroves reforested. - Number of communities participating in mangrove restoration programs.

Operational Leakage Mitigation Measures	Goals	Indicators
prioritize recovery zones and scale up restoration efforts.		

Monitoring and Evaluation of the Plan Frequency: Annual evaluations will be conducted to measure progress against established goals and adjust strategies as necessary.	Reports: Key indicators will be documented in monitoring and verification reports to track the effectiveness of the leakage management strategies.
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Implementation of Preliminary Leakage Management Plan

The activities carried out during the period from 2014 to 2020 were aligned with the fulfillment of the objectives embodied in the “Ethno-Development Plan: Vision of Life of the Tribugá Gulf Communities, 2007 - 2020”. This was achieved by contributing to land use planning processes and responding to the “National Program for the Sustainable Use, Management and Conservation of Mangrove Ecosystems”. As part of the project's leakage management strategy, the following actions were carried out:

1. Conducting 10 strengthening workshops: under the framework of cooperation agreement No. 15 of 2016, ten training workshops were conducted related to STRENGTHENING THE CAPACITIES OF THE COMMUNITIES OF THE LOS RISCALES COMMUNITY COUNCIL, ON FORESTS AND CLIMATES FOR REDD+ IN COLOMBIA. The modules addressed were:

- a. Module 1: basic concepts on forests, climate and carbon.
- b. Module 2: national REDD+ strategy (national REDD+ school).
- c. Module 3: rights, policies of Afro peoples.
- d. Module 4: safeguards and REDD+ multiple benefits.
- e. Module 5: REDD+ project negotiations.
- f. Module 6: REDD+ safeguards - Part II.
- g. Module 7: The PDD.
- h. Module 8: Methodology and Design of a REDD+ PDD.

- i. Module 9: Requirements for a REDD+ Project.
- j. Module 10: Follow-up and Monitoring of a REDD+ Project.

The workshops were developed with the communities belonging to the General Los Riscas Community Council, directly benefiting at least 100 members of the communities and indirectly benefiting 700 families in the collective territory of the Association of Community Councils General Los Riscas.

Workshops addressed focused on REDD+ project tracking and monitoring systems and strategies to prevent carbon leakage.

2. Training Workshop:

There were two workshops carried out in Nuquí related to this topic; the first "identification of impacts" was held on May 18, 2019, and the second "identification of leakage" on May 19, 2019.

On May 18, 2019, the workshop entitled "Identification of Impacts" was held in Nuquí, Chocó. The objective of these two workshops was to strengthen the capacities of the communities of the Los Riscas Community Council in relation to "leakage" that could occur in the REDD+ project, thus ensuring the effectiveness of the project in reducing Greenhouse Gas (GHG) emissions within the framework of "Reducing Emissions from Deforestation and Degradation (REDD)." The first event was attended by 48 people (Annex 54. Negative impacts management workshop) and the second event was attended by 25 people (Annex 55. Leakage workshop).

Leakage in REDD+ refers to the situation in which emissions reductions in one area are offset by increased emissions in another nearby area. This phenomenon can occur due to a variety of factors, such as the expansion of deforestation into adjacent areas or increased pressure on forest resources in unprotected areas.

The training provided to the communities allowed them to:

- Identify the main drivers of deforestation: Understand the causes that can lead to leakage, such as the expansion of agriculture, illegal logging, infrastructure construction or mining.
- Develop prevention strategies: Implement measures to mitigate leakage, such as promoting sustainable forest management practices, protecting key areas, strengthening local governance and environmental education.
- Monitor and evaluate leakage: Design monitoring systems to detect potential carbon leakage, as well as mechanisms to evaluate the effectiveness of prevention strategies.

Capacity building of communities on REDD+ leakage enabled them to actively participate in the management of their forests, prevent deforestation, ensure the integrity of REDD+ projects and contribute to the fight against climate change in an effective manner.



Figure 12. Workshop Identification of impacts, leaks and mitigation agreements.

3. The management plan for the mangroves of the Tribugá Gulf: This document describes the activities carried out for the management and conservation of the mangrove ecosystem, led by the Asociación de Consejos Comunitarios General Los Riscales. These activities were based on a deep knowledge of the mangrove ecosystem as a foundation for the integral management of its goods and services.

Following the parameters established in Resolution 0721 of 2002, reliable information was obtained on several key aspects: the floristic composition and structure of the forest, the natural dynamics of regeneration, and the impacts of human activity on the forest resource. The development of this activity focused mainly on timber and piangua, considered the most important goods that the mangrove provides to the local community, highlighting the relevance of these resources in the context of ecosystem management and conservation.

As a result of this process, a zoning exercise was carried out as a territorial management tool that divided the area into landscape zones, integrating through

planning the requirements of the ecosystems, their conservation and the needs of local stakeholders. Its objective was to strengthen the balance between ecological and socioeconomic aspects, in order to develop short- and medium-term management guidelines and, in this way, guide future actions focused on ecosystem conservation, seeking a balance between environmental protection and socioeconomic development, as follows: Sustainable Use Zones, Recovery Zones, and Preservation Zones.

The community's understanding of the management that should be given to the zoning of the territory is a key strategy to prevent and mitigate leakage. By dividing the territory into sustainable use, recovery and preservation zones, it is possible to develop and implement specific management guidelines for each area, adapted to their particular conditions and needs. Raising awareness of the impacts that human activities have on this type of ecosystem is not only limited to the project area, but is also reflected in the area of leakage.

The mitigation measures were identified in the workshop on May 18, 2019, however, the eight activities that will be supported by the project for the implementation of these actions will be monitored. The management actions of the Gulf of Tribugá mangrove management plan are also being implemented and monitoring is also carried out.

Leakage control must be carried out by maintaining permanent communication with neighbors and local authorities, where the leakage area is located, in order to control and monitor leakage.

On the other hand, the project monitors the leaks during each verification and must evaluate if these are derived from the implementation of the project. Leakage is monitored through the process of image classification and spatial analysis. It is important to establish whether the loss of forest is related to the project, especially with the protected areas in the area, in order to take actions to reduce its impact, together with the environmental authorities in charge of the protected area. These community reports will be followed up in the assemblies held by Los Riscasles.

Compliance with indicators

Operational Leakage Mitigation Measures	Goals	Achievement of Indicators
1. Strengthening Governance and Capacity Building	Train representatives of the Consejo Comunitario	A total of 10 workshops were conducted as part

Operational Leakage Mitigation Measures	Goals	Achievement of Indicators
Operational Measure: Train community members on sustainable resource management and territorial protection under the guidelines of the Plan de Manejo de los Manglares del Golfo de Tribugá. Collaborate with the Consejo Comunitario General Los Riscals to enforce the plan's zoning and resource use regulations.	General Los Riscals and local community members in sustainable resource management and conservation practices. Organize and conduct participatory assemblies with the Consejo Comunitario General Los Riscals to review and reinforce governance strategies.	of the cooperation agreement No. 15 of 2016. These workshops addressed critical topics such as forests and climate, REDD+ strategies, safeguards, and sustainable territorial governance. 100 direct participants from the nine councils of the Consejo Comunitario General Los Riscals received training, indirectly benefiting 700 families. These workshops strengthened local governance structures by providing community members with the skills to manage their resources sustainably and monitor compliance with project commitments.
2. Participatory Zoning Operational Measure: Implement the zoning defined in the Plan de Manejo de los Manglares del Golfo de Tribugá, dividing the territory into sustainable	Georeference additional areas as recovery and preservation zones. Ensure sustainable use zones are actively monitored for compliance with established regulations.	The project implemented zoning guidelines as part of the Plan de Manejo de los Manglares del Golfo de Tribugá, resulting in the designation of:

Operational Leakage Mitigation Measures	Goals	Achievement of Indicators
use, recovery, and preservation zones. Establish and communicate clear regulations for each zone to guide sustainable practices and prevent unauthorized activities.		574 hectares as recovery zones. 510 hectares as preservation zones. Participatory processes ensured community buy-in and compliance, with zoning maps used to define land use clearly and minimize risks of encroachment or leakage.
3. Promoting Sustainable Productive Alternatives Operational Measure: Expand alternative livelihood initiatives such as agroforestry, sustainable fishing, and non-timber product value chains (e.g., vanilla and acai). Enhance the "La Cumbancha" ecotourism circuit to diversify income opportunities.	Engage additional families in agroforestry and alternative livelihoods. Increase the number of visitors to "La Cumbancha".	Direct Impact: families are directly involved in sustainable livelihood activities, such as agroforestry, vanilla and acai value chains, and sustainable fishing. Potential Indirect Impact: The project continues to expand these opportunities to engage more participants. So, the skills and knowledge imparted to 700 families through capacity-building workshops have created opportunities for broader community engagement in sustainable livelihood initiatives in the future.

Operational Leakage Mitigation Measures	Goals	Achievement of Indicators
		Ecotourism was strengthened through the establishment of the La Cumbancha tourist circuit, which has become a key income-generating initiative for the community. Marketing and infrastructure improvements have increased visitor numbers, contributing to economic diversification and reducing reliance on deforestation-prone activities.
4. Reducing Firewood Dependency Operational Measure: Install additional eco-efficient stoves in communities to reduce firewood use. Train families in the proper use and maintenance of eco-efficient stoves to ensure long-term adoption.	Install new eco-efficient stoves. Achieve a reduction in firewood consumption in targeted communities.	A total of 64 eco-efficient stoves were installed in collaboration with the MarViva Foundation. The use of these stoves has resulted in a documented reduction in firewood consumption, significantly mitigating deforestation pressures on mangrove ecosystems.
5. Community Monitoring and Surveillance Operational Measure:	Conduct community patrols annually in high-risk areas.	Community monitoring teams were established to patrol high-risk areas regularly, ensuring

Operational Leakage Mitigation Measures	Goals	Achievement of Indicators
Form community patrol teams to monitor areas at risk of leakage and enforce compliance with zoning regulations. Use satellite imagery to identify deforestation hotspots and guide intervention efforts.	Reduce deforestation rates in leakage-prone areas.	compliance with zoning and resource use regulations. Satellite imagery and spatial analysis complemented field monitoring efforts, identifying deforestation hotspots and enabling timely interventions. As a result, deforestation rates in leakage-prone areas have decreased by 15%, meeting the target reduction.
6. Mangrove Recovery and Reforestation Operational Measure: Reforest degraded mangrove areas using seeds collected by local communities. Collaborate with environmental authorities to prioritize recovery zones and scale up restoration efforts.	Reforest hectares of mangroves. Involve communities in mangrove restoration and management activities.	The project successfully reforested key degraded areas, including mangrove zones along the Chorí River, as part of ongoing recovery efforts. Community members were actively involved in seed collection and reforestation activities, ensuring alignment with local needs and ecological priorities. Collaboration with environmental authorities has laid the groundwork for scaling up restoration efforts to meet the 150-hectare

Operational Leakage Mitigation Measures	Goals	Achievement of Indicators
		target in future phases target in future phases.

Commercially Sensitive Information

The agreements, covenants and financial information of the project are part of the confidentiality agreements held between the parties. Therefore, the project will ensure and respect this condition of confidentiality and said documents will not be shared or disclosed to the public and will only be socialized with the auditing entities

Further Information

There is no further information.

2 SAFEGUARDS

In the framework of the implementation of the Riscales REDD+ Project, the communities belonging to the Community Council have identified the most common risks that may occur in the territory with the implementation of the REDD+ Project. The perceptions of the communities were presented in multiple spaces of collective participation and are reflected in this safeguard document, which identifies the most appropriate prevention and mitigation measures that allow the risks to be reduced or neutralized.

The safeguards for the Riscales REDD+ Project include:

Impact identification and assessment.

Community: risks and adoption of measures.

Biodiversity: risks and adoption of measures.

Stakeholder participation and consensus for decision-making.

2.1 No Net Harm

The communities, in their spaces for dialogue and collective construction have identified that the most important impact in the development of the Riscales REDD+ project is related to promoting sustainable development while promoting livelihoods

and local welfare, i.e. positive impacts are expected in the three main components of the REDD+ project: i) territorial governance, ii) productive activities and iii) capacity building. An additional component that closes the implementation cycle is social investment, for which the impacts mentioned in Table 5 were also identified.

Table 5. Impacts by component in Riscales REDD+ Project

Component	Activity	Expected impact
Territorial Governance	Strengthening of community governance	Communities are expected to be able to improve and redesign internal instruments, adapting them to their requirements and needs, as well as controlling the drivers of deforestation and degradation.
Productive activities	Providing alternative livelihoods to the agents of deforestation	It is expected that communities will be able to improve their productive activities (i.e. agriculture, livestock grazing), boosting the conservation of the forest area. These activities also include the improvement of technology and physical structures, in order to add value to a greater productive linkage.
Capacity building	Improve administrative capacity and local leadership	Improvement in the financial conditions of communities is expected throughout the guarantee of capital flows from sustainable productive activities. It encompasses productive investment and the successful sale of carbon credits.
Social investment	Improving conditions for the inhabitants	Different investments in terms of direct social benefits, including electrification, care facilities, primary care, buildings, and schools.

Since negative impacts were so difficult for local communities to identify due to the overall positive impact they related to this project, on May 18, 2019, a workshop was held with the objective of identifying the potential negative impacts of the eight dimensions of the RISCALES REDD+ project (Annex 54). Negative impacts management workshop.) The meeting was attended by 48 participants, of which 16 were women and 32 were men. Attendees included members of both the smaller councils and the Consejo Mayor. The activity was developed according to the planned methodology and counted with the active participation of representatives from both councils.

During the workshop, participants were encouraged to consider scenarios in which problems could arise, as they commonly focus on the benefits that the project could bring to nature and the community.

It is important to consider the potential negative impacts of each aspect of the project, as well as the actions needed to avoid and mitigate them.

1. Governance:

- Displacement of traditional production models: the imposition of production models alien to local practices and culture could affect traditional livelihoods, generate internal conflicts and decrease community self-sufficiency by relying on other production models.
- Environmental degradation due to uncontrolled tourism: Uncontrolled mass tourism can damage fragile ecosystems and local resources, in addition to generating inequality if only some sectors benefit economically, leaving others without improvements in their quality of life
- Community fragmentation by exclusion: The exclusion of certain groups or individuals could generate tensions, fragmentation and resistance to the project, making unified support and effective implementation of REDD+ activities difficult.
- Corruption in the management of funds: Corruption or lack of transparency in the management of funds can demoralize the community, limit the benefits of the project and lead to poor implementation of key activities for its success.
- Violation of rules or agreements: Failure to comply with established rules and agreements generates distrust, deteriorates community cohesion and can lead to unsustainable practices, jeopardizing both the nature and expected positive social impact of the project.
- Non-compliance with the municipal land-use planning scheme: Without adequate planning, conservation and production activities could be carried out in inappropriate areas, affecting essential resources or areas of cultural importance, generating conflicts over land use between sectors of the community.

2. Sustainable Forest Management:

- Loss of carbon sequestration capacity: deforestation reduces the forest's capacity to capture carbon and harbor biodiversity, affecting conservation objectives.

- Deterioration of sustainable forest management: Non-compliance with internal regulations hinders sustainable practices, allowing unregulated activities and contributing to inefficient management.
- Accelerated degradation of the forest ecosystem: Indiscriminate logging and burning rapidly degrade the forest, increasing carbon emissions and losing biodiversity.
- Habitat fragmentation and erosion: The expansion of cattle ranching aggravates deforestation, fragments habitat, erodes soil and affects forest regeneration.
- Contamination of natural resources: Inadequate solid waste management contaminates the soil and water, damaging the local flora and fauna and affecting the forest ecosystem.
- Destruction of forest areas due to lack of planning: Lack of adequate planning destroys forest areas and aggravates pressure on ecosystems, without guaranteeing long-term sustainability.
- Reduction of carbon storage capacity and biodiversity: Degradation due to extraction and logging reduces the ecosystem's capacity to store carbon and maintain its biodiversity, making sustainable management difficult.

3. Forest Delimitation, Tenure and Ownership Limits, and Forest Protection Areas:

- Lack of knowledge of boundaries: Lack of knowledge about the boundaries of the territory can cause overexploitation of resources and conflicts between land users.
- Agricultural expansion: New crops can invade protected forest areas, reducing forest cover.
- Community conflicts: Land disputes hinder delimitation and conservation activities.
- Species loss: Deforestation and habitat degradation affect biodiversity, jeopardizing the project's conservation objectives.

4. Silvopastoral and Assisted Reforestation Activity:

- Damage to aquatic ecosystems: the use of inappropriate fishing gear generates damage to aquatic ecosystems and biodiversity, affecting forest regeneration and riparian ecosystems.

- Environmental degradation due to uncontrolled tourism: Uncontrolled tourism overloads the natural resources, affecting conservation and ecological restoration practices.
- Habitat fragmentation and erosion: Grazing by cows or invasive crops degrades the soil and reduces the regenerative capacity of the forest, driving deforestation.
- Soil erosion and loss of investment: Unfinished works generate soil erosion and loss of investment, compromising restoration and ecological conservation efforts.

5. Energy Alternatives for Cooking Food:

- Environmental pollution: the use of alternative energy sources can generate pollution and affect health if they are not properly maintained.
- Increased food prices: Increased tourism raises the prices of basic foodstuffs, affecting the food security of local communities and making it difficult to implement sustainable practices.
- Unequal distribution of goods: Unequal distribution of resources and technologies generates tensions and inequality in the community, affecting cooperation and the success of conservation strategies.
- Lack of consensus: Lack of agreement among community members, due to egocentric attitudes, hinders the implementation of collaborative solutions, affecting the effectiveness of energy alternatives and REDD+ project objectives.

6. Productive Alternatives:

- Reduction of water resources: excessive water consumption depletes water resources and affects ecosystems.
- Contamination of the sea, beaches and jungles: Damages biodiversity and aquatic ecosystems.
- Increased greenhouse gas emissions: High energy consumption increases greenhouse gas emissions.
- Increased CO2 emissions: High use of fossil fuels increases CO2 emissions and reduces the benefits of the REDD+ project.
- Noise Pollution: Affects health and ecosystems.

- Carbon release: Cutting down trees contributes to climate change and reduces the mitigation capacity of the project.
- Loss of local fauna: The loss of habitat for productive alternatives generates the loss of fauna.
- Social and cultural fluctuations: The high tourist flow causes social tensions and pressure on resources.

7. Training and Capacity Building:

- Food insecurity: inappropriate practices can put biodiversity and local capacity to produce sustainable food at risk.
- Adoption of inappropriate agricultural practices: The use of methods that are not adapted to the territory can damage local ecosystems and affect sustainable production.
- Invasion of activities from outside the territory: The expansion of foreign agricultural and cultural models can damage local identity and natural resources.
- Loss of cosmovision and collective roots: Changes in traditional lifestyles weaken community cohesion and the ability to implement sustainable solutions.
- Organizational weakness: The lack of a solid organizational structure impedes natural resource management and effective decision making.
- Lack of collective leadership: The absence of effective leadership makes it difficult to coordinate efforts to implement sustainable practices.
- Outdated information: Lack of access to up-to-date information on sustainable practices impedes informed decision making.
- Lack of clarity in community decisions: Lack of consensus in decision-making generates conflicts and hinders the implementation of sustainable activities.
- Lack of agreement on needed works: The inability to make clear decisions on community works can delay the development of effective solutions.

8. Providing Alternative Livelihoods to Agents of Deforestation:

- Overhunting: reduces local biodiversity, affecting ecosystems.
- Uncontrolled logging: Contributes to deforestation and increased carbon emissions.

- Destructive fishing: Damages aquatic ecosystems and reduces biodiversity.
- Marine pollution by waste: Affects marine fauna and water quality.
- Accumulation of solid waste: Contaminates soil and water, affecting biodiversity and habitat quality.
- Dependence on unsustainable products: Generates pressure on ecosystems by relying on unregulated extractive activities.
- Increased livestock and agriculture: Increases deforestation and reduces the quality of natural ecosystems.
- Ecosystem degradation: Uncontrolled agricultural expansion deteriorates forest and aquatic ecosystems.
- Lack of awareness: Lack of education about the environmental impact of economic activities can lead to unsustainable practices.
- Species displacement and habitat destruction: Invasion of new species and practices destroys local habitat and reduces biodiversity.

It is important to also consider the actions needed to avoid and mitigate these impacts in each dimension.

1. Governance:

- Good communication with all communities: ensures that all members are informed about the benefits, avoiding mistrust or conflict and encouraging collective commitment.
- Determination of carrying capacities and design of tourism infrastructure: Avoid mass tourism and reduce environmental impacts, protecting the sustainability of the natural environment.
- Strategic planning: Aligns activities with clear objectives, minimizing negative impacts and integrating productive development with conservation.
- Facilitation of participation: Ensures that the entire community is involved, creating a sense of belonging and equity in benefits and responsibilities.

- Control and monitoring system: Prevents the violation of regulations and regulates activities, ensuring that agreements are respected and avoiding the unsustainable exploitation of resources.
- Education and awareness of regulations or agreements: Reinforces commitment and compliance with agreements, promoting a culture of respect for the territory.

As a compensatory measure, the project will hold periodic accountability assemblies with the community, where progress on the eight activities will be presented prior to each verification. The objective is to ensure transparency and foster open dialogue with local stakeholders.

In parallel, Environmental Awareness Workshops and the Núqui School of Leaders will continue, aimed at strengthening knowledge about conservation, regulations, and sustainable best practices (Annex 71, 72 and 73). Additionally, the community will be integrated into environmental monitoring activities, recognizing their fundamental role in protecting the environment.

Likewise, the participatory strengthening of productive chains and sustainable tourism will continue, designed under carrying capacity criteria to avoid overcrowding and ensure an equitable distribution of economic benefits. These actions seek to responsibly and sustainably boost the local economy. The aforementioned is described in greater detail in Section 1.11.1.

2. Support the Development and Implementation of Sustainable Forest Management:

- Regulation of hunting: Controls indiscriminate hunting, protecting biodiversity and ecological balance.
- Reforestation of degraded areas: Recovers deforested areas, improving carbon sequestration and biodiversity.
- Sustainable ecosystem management: Promotes responsible practices in terrestrial and marine ecosystems, avoiding contamination and destruction.

- Community awareness of environment and society: Promotes cooperation in conservation practices, reducing habitat fragmentation and supporting regeneration.
- Equality in community processes: Ensures inclusive and equitable decisions, promoting sustainable forest management and environmental protection.
- Community training and capacity building: Empowers communities to manage natural resources efficiently, avoiding environmental destruction and promoting sustainability.

Environmental awareness campaigns will continue, utilizing participatory methodologies tailored to local contexts. As a compensatory measure for the sustainable management of ecosystems, three key actions will be implemented:

1. The participatory development of consensus-based land-use plans.
2. Community-based environmental monitoring with a combined technical-local approach.
3. The establishment of conservation agreements with clear incentives for communities.

This comprehensive strategy seeks to ensure that mitigation measures are not only effective but also socially inclusive and environmentally responsible, thereby strengthening shared governance of natural resources.

The project will continue implementing environmental awareness campaigns through participatory methodologies adapted to local contexts, alongside the KIONGOZI School's leadership model. As compensatory measures for sustainable ecosystem management, three key actions will advance: (1) participatory consensus-based land-use plans, (2) community-led environmental monitoring blending technical and local knowledge, and (3) incentivized conservation agreements. This dual approach—combining ecological stewardship with leadership development—ensures mitigation measures are not only effective but also socially inclusive and rooted in local agency. By equipping Nuquí's leaders with skills to drive socioeconomic transformation and leveraging the region's natural and cultural assets, the initiative strengthens shared governance of resources, fosters endogenous development, and positions itself as a benchmark for community-powered change (Annex 71, 72 and 73).

3. Forest Delimitation, Tenure and Property Limits, and Forest Protection Areas:

- Delimitation of the territory: Prevents conflicts and overexploitation by clearly defining the limits.

- Technification of crops: Reduces agricultural expansion and promotes sustainable practices.
- Clarity between landowners and the Community Council: Avoids disputes and guarantees collaborative management of the territory.
- Decision-making adjusted to the territory: Ensures that land use is appropriate and sustainable.
- Infrastructure control: Prevents the alteration of ecosystems and uncontrolled deforestation.
- Species use awareness: Protects biodiversity by reducing illegal resource extraction.
- Community assemblies and agreements: Promotes orderly management and avoids conflicts over resource use.
- Community overseers: Ensures that the limits of the territory are respected and prevents destructive activities.

The project will implement periodic monitoring before each verification of Forest Delimitation, Tenure and Property Limits, and Forest Protection Areas, with the objective of evaluating the actual impact of the measures on reducing deforestation and forest degradation. These monitoring efforts will determine whether the strategies—such as territorial delimitation, crop technification, and community surveillance—are achieving their goal of curbing the advance of deforestation, degradation, and promoting sustainable management of the territory's available resources.

Continuous monitoring is essential to validate that the project's actions effectively contribute to conservation and to introduce evidence-based improvements. This will ensure that forest delimitation, governance, and protection are not limited to theory but are effective, respectful of communities, and adaptive.

The active participation of the community will be crucial to validate findings and adjust strategies. Community assemblies and overseers will serve as feedback mechanisms, ensuring that decisions align with the real needs of the territory. As an additional measure to guarantee the monitoring of the project's boundaries, a request was submitted to the National Land Agency (Agencia Nacional de Tierras) for the spatial delineation of the collectively recognized and titled territory, including the areas of excluded properties within the territory, in accordance with the Exclusion Order (Auto de exclusión) issued by the Ministry of Agriculture in 2002 (Annex 74).

4. Silvopastoral and Assisted Reforestation:

- Responsible fishing: Prevents damage to aquatic ecosystems and biodiversity.

- Animal monitoring: Prevents fragmentation and alteration of habitats.
- Reforestation with native species: Restores ecosystems and promotes forest regeneration.
- Community training: Promotes sustainable practices and conservation of natural resources.
- Sustainable tourism: Avoids overloading resources and protects the environment.
- Inclusive decisions: Ensures sustainable land management and avoids conflicts.
- Community participation and consensus for decision making: Promotes collective management of resources and avoids environmental degradation.
- Finished and functional works: Avoids soil erosion and protects conservation investment.

The project implements a comprehensive conservation approach through measures like responsible fishing, wildlife monitoring, and native species reforestation that protect ecosystems while promoting community governance. These actions mitigate environmental damage such as habitat degradation and resource conflicts while strengthening sustainable collective management.

To reduce pressure on forests and mangroves, the project will continue sustainable firewood planting and harvesting practices following established technical manuals (Annex 3), along with implementing the Gulf of Tribugá Mangrove Management Plan (Annex 11) to ensure protection and rational use. This includes a combination of assisted natural regeneration, business-oriented or compensation projects, and silvopastoral arrangements in the few areas opened for livestock. The assisted and silvopastoral reforestation will enable regeneration of exploited species like chachajo, wina, cedar, jigua and choiba, ensuring provision of forest ecosystem services. These measures will reduce dependence on illegal logging while promoting regenerative use.

Active restoration will continue through forest growth plots and techniques like direct seeding and nursery seedlings (Annexes 12-13), complemented by training in seed collection and land preparation (Annex 1). This practical-technical approach ensures effective recovery of mangroves and forests while empowering communities with sustainable tools.

The project maintains emphasis on community participation and constant monitoring, adapting strategies based on results. The combination of functional infrastructure, ecological restoration, silvopastoral systems, and training creates a replicable model that not only prevents environmental damage but activates ecosystem regeneration

and promotes social equity. Adherence to technical protocols guarantees measurable, sustainable long-term impacts while preserving valuable timber species and their ecological functions.

5. Energy Alternatives for Food Cooking:

- Anti-pollution campaigns: prevent environmental pollution by ensuring proper maintenance of alternative energy sources.
- Community work: Encourages cooperation, avoiding unequal distribution of goods and ensuring the success of conservation strategies.
- Fair tourism: Avoids high food prices and protects local food security through sustainable tourism.
- Equity: Promotes a fair distribution of resources, avoiding inequalities and promoting sustainable development.
- Avoid selfishness: Facilitates collaborative decision making, overcoming the lack of consensus and ensuring the effectiveness of the proposed solutions.

The project will maintain the implementation of efficient cooking technologies, building upon documented successes in the territory:

- Energy-efficient stoves: Drawing on the results of the REDD+ feasibility study (Annex 14), which confirmed their potential to reduce emissions and forest pressure.
- Proven experience: Through Agreement 012 of 2012 with Marviva, fuel-efficient stoves were implemented in Los Riscasles (Annex 15), achieving:
- 40% reduction in mangrove firewood extraction.
- Locally designed stoves optimized for combustion, benefiting 20 families (Annex 16).

With the "Cooking While Conserving" manual (Annex 17), which ensures the scalable replication of these technologies. The combination of technical tools (stoves), institutional agreements, and community participation creates a replicable model. Its continuity will ensure not only impact mitigation but also the transition to sustainable energy systems, aligned with social justice and the protection of critical ecosystems. These actions complement social strategies by:

- Reducing resource conflicts by decreasing firewood demand.
- Strengthening equity through access to quality-of-life improving technologies.

- *Linking environmental incentives as part of the REDD+ system to conserve mangroves.*

6. Productive Alternatives:

- Alternative energies: Reduce the use of fossil fuels and reduce greenhouse gas emissions.
- Cooking briquettes: Reduce deforestation and smoke pollution, protecting biodiversity.
- Electric airplanes: Reduce CO2 emissions in the transportation sector, supporting REDD+ objectives.
- Home and rooftop gardens: Promote local food production, reducing pressure on natural ecosystems.
- Agricultural management and crop rotation: Prevents soil degradation and loss of local wildlife.
- Waste management: Reduces environmental contamination, protecting aquatic and terrestrial ecosystems.
- Tourism regulation: Controls the flow of tourism to avoid social tensions and overexploitation of natural resources.

The project will continue strengthening sustainable agro-industrial chains, aligning with implemented environmental measures such as alternative energies, cooking briquettes, and tourism regulation. These initiatives aim to reduce deforestation, decrease emissions, and create economic opportunities for local communities.

1. Expansion of Coconut Production:

In Los Riscas, existing crops will be enhanced and new coconut plantations will be established using an agroforestry model that integrates short-cycle crops like bananas and plantains. This ensures temporary income while producing virgin coconut oil and copra, maintaining soil fertility.

2. Sustainable Açaí Management:

The project will train communities in sustainable harvesting techniques for this wild fruit and introduce cultivation methods without deforestation. Technical assistance and processing infrastructure will be provided to add value to this production chain.

3. Vanilla as a Conservation Crop:

Leveraging its high international demand, vanilla cultivation will be promoted as an economic

alternative that supports biodiversity. The project will build on previous FOS-KIA training to implement sustainable business plans.

4. Cocoa Transformation:

Production will expand into derivatives like cocoa liquor and powder, targeting specialized market niches. This diversification aims to increase profitability while maintaining sustainable agroforestry practices.

5. Commercialization of Sugarcane Products:

The project will support sugarcane processing into products like panela and beverages, strengthening national and international commercialization channels to ensure profitability.

These productive actions complement environmental objectives by:

- Reducing pressure on forests through agroforestry systems
- Generating sustainable economic alternatives for communities
- Contributing to REDD+ ecosystem conservation goals

The continuation of these initiatives consolidates a balanced model that integrates conservation and development, ensuring long-term environmental and social benefits.

Note: Each production chain was designed to harmonize with existing conservation strategies while offering scalable economic opportunities.

7. Training and Capacity Building:

- Train in sustainable practices: promotes the proper use of the territory, avoiding degradation and depletion of natural resources.
- Environmental education from childhood: Promotes ecological awareness in new generations, ensuring long-term sustainability.
- Strengthening of traditional practices: Maintains local cultural identity and ensures the conservation of natural resources through the support of local knowledgeable people.
- Design of training models based on ethnodevelopment: Ensures that solutions are adapted to the realities and vision of the community, respecting their culture and needs.
- Leaving installed capacity: Ensures that the knowledge and skills acquired are maintained in the long term, strengthening local autonomy.
- Strengthening local leadership: Improves the capacity of leaders to coordinate sustainable activities and make effective decisions.

- Leaders updated on information: Ensures that leaders are well informed about sustainable practices, promoting effective decision making.
- Informed communities to make decisions: Facilitates active community participation in planning and implementing activities, ensuring consensus and effectiveness.
- Informed leaders with clarity in decision making: Improves clarity and cohesion in community decisions, avoiding conflicts and promoting sustainable solutions.

By prioritizing training in sustainable practices and environmental education from childhood, it seeks to generate structural changes that endure beyond the implementation period. The strategy of training communities in administrative and financial management - with support from SENA - shows a clear vision of local empowerment, ensuring that the benefits of the REDD+ project are maintained in the long term.

A notable aspect is the integration of traditional knowledge and modern techniques. The Kiongozi Leadership School serves as a strategic bridge, training community leaders while preserving ancestral knowledge development (Annex 71). This, combined with initiatives such as efficient stoves and the recycling network, demonstrates an intelligent adaptation of global solutions to local contexts. The active participation of women in organic fertilizer production and decision-making also reflects a relevant gender focus for territorial (Annex 16).

The project's sustainability appears well grounded in three pillars: building local capacities, generating green economic alternatives, and inclusive community governance. However, its long-term success will depend on maintaining monitoring processes, ensuring continuous funding flows, and deepening inter-institutional coordination. The systematic documentation of lessons learned will be key to replicating this model in other territories with similar socio-environmental characteristics.

8. Providing Alternative Livelihoods to Agents of Deforestation:

- Empowerment within the community: Effective and participatory leadership within the community allows for informed decisions and sustainable practices that protect natural resources.
- Productive alternatives: Introducing sustainable productive alternatives reduces pressure on ecosystems, avoiding destructive practices such as excessive hunting and uncontrolled logging.

- Responsible and sustainable land use: Responsible land management ensures the protection of natural resources, prevents pollution and promotes biodiversity conservation.

At this point, it is important to highlight that since the project's inception, various mitigation measures have been implemented to reduce the negative impacts previously identified by communities in this section. These efforts sought to integrate governance actions, conservation, sustainable production, and environmental education, along with the eight proposed strategies to reduce GHG emissions from deforestation and degradation.

To mitigate risks of exclusion in decision-making, benefit capture, and organizational weaknesses (impacts 3, 4, 5, 37, 38), the project implemented strategic actions focused on strengthening the governance system (detailed in section 1.11.1). These actions included ten workshops and four local assemblies designed to enhance community capacities in sustainable management practices, ensuring deeper understanding and active participation in decision-making processes. These activities are evidenced in Annex 52: Cooperation Agreement Fondo Patrimonio. The establishment of the Kiongozi Leadership School fosters local leadership development by equipping community leaders with essential skills to drive transformative change. By leveraging the region's natural, social, and cultural assets - alongside national and international development frameworks - the school empowers grassroots leaders to enhance collective well-being and socioeconomic progress in Nuquí. As outlined in Annexes 71-76, its programs strengthen endogenous development, positioning Kiongozi as a benchmark for sustainable, community-driven growth. Additionally, participatory workshops were conducted to collaboratively and transparently build a benefit distribution mechanism (impact 4).

To address deforestation, indiscriminate logging, biodiversity loss, and lack of territorial planning (Impacts 6, 7, 9, 14, 16, 17, 24, 25, 26, 41), the project incorporated guidelines from community life plans and the DRMI Gulf of Tribugá declaration, establishing clear zoning for sustainable use, recovery, and preservation - representing significant progress toward territorial planning (Impact 6). Mangrove management plans (Annex 11) identified specific areas for restoration (574 ha) and conservation (510 ha), while regulating timber and piangua extraction to curb degradation (Impact 13) and loss of forest species (Impact 17).

Assisted reforestation with native species and direct mangrove planting (1.11.4, Annex 12) directly combat deforestation (Impact 7) and wildlife loss (Impact 25). These actions reduce pressure on forests and improve coastal-marine resource management, protecting biodiversity and ecosystem services.

To counter mass tourism, unsustainable economic dependence, and land-use conflicts (Impacts 2, 15, 18, 19, 20, 42), the project developed strategies to promote value chains in agriculture (coconut, chontaduro, vanilla) with fair local markets. Integrating agroforestry and silvopasture (1.11.4) diversifies productive practices and reduces livestock expansion (Impact 10) and agricultural frontiers (Impact 15). Strengthening regulated community tourism, like the La Cumbancha ecotourism circuit (Annex 5), offers alternatives to mass tourism (Impact 2) that respect carrying capacity (Impact 50). These initiatives diversify income without resource overexploitation, promoting community-planned development (Impact 12) while preventing exclusive reliance on tourism (Impact 19).

To address high firewood consumption and potential smoke pollution (Impacts 27, 28, 29), eco-efficient stoves were installed (Annex 16) to reduce wood use, decreasing pressure on forests (Impact 7) and mitigating tree cutting/carbon release (Impact 30). Promoting fuelwood gardens (Annex 3) provides sustainable alternatives to natural forest extraction, reducing deforestation while improving indoor air quality.

To mitigate potential loss of traditional knowledge and harmful practices (Impacts 34, 35, 40, 43, 44), ten workshops engaged youth and women in sustainable forest/fishery management, strengthening territorial knowledge. Community regulations like fishing bans and prohibitions on destructive gear (Annex 11) prevent inadequate practices (Impact 18) and protect marine resources.

Finally, the Riscales REDD+ project has established a rigorous and systematic approach to ensure its transparency and effectiveness over time to establish a validation and verification schedule. As part of this approach, independent verifications will be conducted every three years. These verifications are intended to assess the progress of the project in relation to the established objectives, as well as to check the efficiency of the implementation of the actions designed to reduce greenhouse gas emissions.

During each verification cycle, comprehensive audits will be carried out that will examine both the technical aspects of the project and the measurement of emission reductions and the conservation of ecosystems and the participation of local communities and respect for their rights. This will ensure that the practices adopted are aligned with the expectations and needs of the affected communities, promoting an inclusive and participatory approach.

In addition, the verifications will provide the opportunity to identify areas for improvement, allowing for necessary adjustments to the project strategy. This periodic review process will not only ensure accountability to stakeholders, but will also build confidence in the project locally, nationally and internationally.

The findings of these reviews will be shared with all stakeholders, ensuring open communication and promoting the continued participation of communities in project monitoring. With these actions, the Riscas REDD+ project is committed to maintaining a high standard of environmental and social management, contributing to sustainable development and the protection of natural resources in the region (Annex 56. Commitment agreement signed between the Afro Colombian communities of the General Community Council of the Riscas of the municipality of Nuquí, in the framework of the implementation of the Riscas REDD+ project in the collective territory where the black communities live).

2.2 Local Stakeholder Consultation

From the outset of the project, the team established management, advisory, monitoring and participatory structures to ensure the active involvement of all stakeholders, promoting joint planning and implementation of activities. This is particularly relevant as local communities play a key role as owners and implementers of the project, which will contribute to the reduction of GHG emissions in the long term. In accordance with Law 70 of 1993, the right of Afro Colombian communities and their organizations to participate in decision-making that affects them is recognized, and such decision-making is done by consensus and approved in assembly.

The General Council, on February 22, 2014, convened the 9 Minor Councils to reach an agreement in an assembly (Annex 57 Acta 22 febrero 2014). Point 6, "Presentation of Invited Institutions", was determined by consensus and was signed by 2 representatives, with the unanimous approval of 84 representatives, who agreed with the implementation of the REDD+ project. It was established that the Mayor Council will be the proponent of said project.

After the General Council approved the project in December 2014, eight (Panguí, Coquí, Jovi, Termas, Partado, Arusi, Jurubirá, Tribugá) of the nine Minor Councils called for local meetings (Annex 58 Informe de actividades de socialización). Due to the oral culture of Afro-Colombian communities, socialization meetings are considered the most effective tool for communication. They learned about the project's implementation steps, the roles of the involved stakeholders, the risks and restrictions of the project for the community, the costs and benefits for locals, and the applicable laws and regulations during the meetings.

The implementation of REDD+ actions in the territory of an ethnic group had to guarantee the right of the communities to effectively participate in decision-making, taking into account the normative framework for the protection of the rights of these communities. This implied carrying out processes of information, dialogue and joint

construction, as well as the generation of decision-making spaces where the autonomy of the peoples in the management of their territories was respected. It is essential to highlight that these processes were not only carried out in an informative environment, but actually facilitated a bidirectional exchange of ideas and concerns. Communities were empowered to participate in meaningful discussions, ensuring that their traditions and values were considered at every stage of the project.

Actions implemented in ethnic territories had to take into account the uses and customs of each group involved, as well as respect their own decision-making structures. To this end, agreements such as contracts for working with the stakeholders in the territory had to be in place. This ensures that the project is not only aligned with national and international regulations, but also respects the cultural particularities of the local communities, promoting a holistic approach that considers both environmental interests and human rights.

The process of stakeholder identification was initiated with the communities dwelling in the area, and legally owning the land. Also, the owners and operators of lodges and tourism services in the area could be relevant stakeholders to, as they demand a large part of the agricultural produce, and timber. The identification of stakeholders was carried out following the methodology of Mitchell, Agle and Wood (cited by Falcao & Fontes 1999), which develops a coherent methodological sequence to define “who is considered? and who is not? A stakeholder”.

The Riscales REDD project is an initiative with a long-term action horizon (30 years), which is currently in the early implementation phase. In accordance, the stakeholders that currently play a leading role in the project were identified, as well as those that are expected to be involved in the long term. The project design contemplated the establishment of monitoring and evaluation mechanisms that allow for adjusting actions based on feedback from the communities, thus guaranteeing continuous and not just one-time agreement.

The indigenous and Afro communities bordering Los Riscales could also be stakeholders of interest. See Table 8.

The organizations that are part of the Gulf of Tribugá Environmental Management Board were also identified as potential stakeholders. This Board is made up of Los Riscales as the ethnic-territorial authority, the Municipality of Nuquí as the municipal authority, CODECHOCO as the environmental authority, AUNAP as the fishing authority, community organizations and technical support organizations, such as research centers and ONG's. In this roundtable, the competent actors interested in the social, environmental, and economic development of the Nuquí territory are brought

together to make decisions on the planning and management of the DRMI's coastal marine territory.

For the time being the stakeholder management actions carried out within the framework of the REDD+ project have concentrated on the primary stakeholders, due to their importance for the design and early implementation phases of the project.

Accordingly, several primary stakeholder management actions have already been carried out as described below and a strategy for the future management of each stakeholder category will be designed and implemented to ensure project development on a sustainable basis.

From the beginning of the project, a proper joint work process was established to the afro descendant communities from the General Community Council of Los Riscasles. This is especially important, as the community must have an active participation during the design of the project.

Furthermore, the project planning has respected the existing formal community governance structures and processes. Specifically, the communities are organized in community councils, led by a governing board, and represented by a legal representative. Every 3 to 4 years, board members are democratically elected, and during a General Assembly, the Board appoints the Legal Representative. During the process potential risks and benefits of participating in the project have been exposed and discussed, ensuring a transparent process. It is important to mention that this process has also respected the community's autonomy to stand for their own decisions regarding their engagement in REDD+ projects. The General Assembly is the widest and most representative governing body, as every member of age has a right to be present and to vote. The General Assembly has been constantly involved in the idea, design and actions so far advanced of the project (See Annex 10 Memorias reuniones locales REDD).

Moreover, the on-going planning exercise has also been based upon continuous exchanges on the REDD+ Riscales and the communities, supported by Patrimonio Natural, ICCO and other partnerships. The professionals that have supported the program's climate change component, have provided technical support and oversight to the entire project on REDD+ issues through participative workshops. This group has been responsible for undertaking formal social engagement activities (workshops, work sessions, meetings, etc.) (See Annex 2 Strengthening capacities FOS-KIA Project).

The stakeholder engagement effort has also been supported by outside groups that provided technical support inputs, including: 1) baseline socio-economic assessments

developed by Southpole; 2) Ethnic development agendas carried out by Fundación Swissaid, the Pacific Environmental Research Institute, the Netherlands Embassy and Choco Popular Districts Organization - OBAPO.

Continuing with this dynamic of joint work, The General Assembly will approve the specific REDD+ plans for the project to ensure wide-spread representation among all community members. Board members, and especially appointed delegates, will be in charge of working and agreeing on the specific REDD+ plans, developed jointly with the communities.

2.2.1 Other Stakeholder Consultation

As already explained in the previous section, a set of workshops has been conducted to discuss and build the REDD+ Project in a participatory manner. Throughout the socialization process, emphasis has been placed on the development of appropriate community level engagement processes and materials to ensure complex issues are presented in a way that communities can understand. This included identification of the project zone, participatory mapping of project areas, identification of risks to the communities, prioritization of project activities, and role-playing to better understand potential financing and implications for the project.

From the various workshops and socializations, the respective memories or summaries have been elaborated, in which are included the contributions, doubts, suggestions or comments made by the communities or the members of The General Assembly. All of the socialization activities are finalized with a formal signing of meeting minutes.

The scheduling of meetings and workshops has been done to ensure: 1) formal approval from community assemblies is undertaken in an objective and timely manner; 2) communities understand and can take coherent decisions regarding the negotiation of any term sheet with investors; 3) the communities are able to understand and commit to any final contract that emerges because of these activities.

In the initial phases of socialization, the communities of Los Riscas expressed the need to continue training activities on REDD+, carbon certificates and in general on the following phases and the implementation of the project. In response to this community need, the FOS-KIA Project was designed with an emphasis on community capacity building and participation in the areas of forests, climate change and REDD+.

During the PDD preparation phase, the contracted consulting firm conducted field visits and workshops. The comments and suggestions made by the communities were included in the PDD. After this process of elaboration of the PDD, the community expressed the need for a Spanish version of the project's important documents and

communications. In response, a Spanish executive summary of the REDD+ PDD was made and submitted to the Assembly for discussion and approval. Also, was elaborate and submitted a Spanish version of the PDD. Within the framework of the FOS-KIA Project, a specific module on the PDD was designed and dictated in order to achieve maximum knowledge and exchange with the communities regarding the project design document. (See Annex 2 Strengthening capacities FOS KIA Project, file Training PDD).

In agreement with the community, the officials of Patrimonio Natural and ICCO Cooperation, perform another good practice that allows the community to be informed and express themselves in real time. This simple but effective practice consists of copying to the legal representative of the Riscales all mails related to the different external and internal activities related to the project. For example, the registration of the project in the international platforms and the important communications with the validator, with potential donors and others.

2.2.2 Stakeholder Conflicts and Grievances

The project relies on existing and emerging institutions to mediate any conflict arising from project related activities. The General Assembly and Legal Representative will develop a Grievances and Redress Mechanism, stating clear procedures and responsible parties for recording, processing and replying to potential information requests, suggestions, complaints and claims posed by community members related to the implementation of the REDD+ project.

2.2.3 Grievances and Redress Mechanism

The organizational structure of the Grievance and Redress Mechanism will be as follows:

- The project Coordinator of the Community Council will be the Grievance Mechanism Manager.
- Surveillance rangers that will be part of the REDD+ team will assist the Grievance Mechanism Manager in researching and understanding each grievance or claim.
- Grave conflicts or complaints (i.e. those that cannot be solved by other procedures in the Grievance and Redress Mechanism) will be heard by a mediation body, including the Governing Board President, Legal Representative. The Grievance Mechanism Manager concerned parties and other guests are welcome to attend the Mediation Session. After studying each case and employing the procedures established in the Assignments Manual a decision will be rendered.

The process for receiving, hearing, responding to and attempting to resolve Grievances, within a timely manner, is as follows:

First, the project will attempt to amicably resolve any grievances that arise, and provide written responses, in a way that is culturally appropriate and considers traditional methods that the communities currently use to resolve conflicts. Specifically, the project will be able to receive requests in both oral and written form.

Written requests will be presented according to the following procedures. These requests can be placed in the mailbox placed outside the Administrative Office or personally handled to the Grievance Mechanism Manager, or delegates, during office hours. There will be an official notice indicating the hours of operation and the name of the person responsible for hearing grievances, and instructions for following up on any grievances left in the mailbox. For all written grievances, a receipt of the delivery will be given that includes the date, time and place of receipt, name of the stakeholder, the name and signature of the person receiving the grievance, the classification process, and an identifiable serial number to keep track of the document.

Once requests are received, the Grievance Mechanism Manager will classify the Grievance as either: 1. Request for more information, clarification, or requirement for communication. These types of requests will receive a written response; 2. A critique, protest, or demand over a situation, process or problem to be solved. These types of requests will receive a signed written response according to the responsibilities set forth in this Grievance Mechanism. The Grievance Mechanism Manager will attempt to resolve the claim, with the Governing Board of the Community Council through its Legal Representative. Claims will be classified and handled accordingly. Specifically:

- Claims related to operational, organizational, and planning or coordination related matters will be handled directly by the Grievance Mechanism Manager within 8 days.
- Claims related to inequity of resource allocation and/or distribution of benefits will be addressed by the Governing Board of the representative Community Council within 15 calendar days.

In cases of inequality and/or impaired ability to participate in social processes to define and implement REDD+ activities, conflicts due to land and family or community resource use and ownership, and impacts of project activities on offsite stakeholders, claims will be first addressed by the Grievance Mechanism Manager. If the claim is beyond the scope of his ability to resolve, the Governing Board of the Community Council and/or their Legal Representative will take appropriate action within 30 calendar days; and Secondly, Grievances that cannot be resolved by the above-

mentioned internal procedures will be referred to the Camara de Comercio de Chocó or to the Defensoria del Pueblo, identified as the Mediation Bodies. These cases would be considered Grave Conflicts that require a response from the President and Legal Representative of the Governing Board of the Community Council. For such conflicts, a response will be provided within 45 calendar days. The Assignments Manual will contain more detailed procedures for listening to the conflicting parties.

Finally, any Grievances that are not resolved through mediation shall be referred either to a) arbitration, to the extent allowed by the laws of the relevant jurisdiction; or b) competent courts in the relevant jurisdiction, without prejudice to a party's ability to submit the Grievance to a competent superior adjudicatory body, if any. Such procedures will also be developed in the Assignments Manual

2.2.4 Negative Community Impact Mitigation

In general terms, the expectations throughout the project development are positive for all the stakeholders. Nonetheless, potential negative impacts must be assessed in order to identify mitigation measures to diminish and neutralize them.

Table 6 shows the impacts detected by each dimension of the project, which have been identified in the implementation of the Riscales REDD+ Project and in the negative impacts workshop, which can directly impact the communities, as evidenced in section 2.1.

Table 6. Negative community impacts and mitigation measures

Impacts	Consideration	Mitigation measures
Leakage to outer communities	Increase of population migration to offsite spaces for the development of current productive activities; these activities include access to HCV' areas	Leakage management plan
Income reductions	Community could perceive a reduction in revenue due to increased governance in the project zone. In this case it is likely to perform deforestation activities in nearby areas.	Proposal of alternative livelihoods and constant adaptation of governance instruments.
Increase of cost of living	There has been a perceived increase in living costs because the ecosystem is now a conservation zone, which has spurred the growth of ecotourism. This increase in tourism activity has made various goods and services in the region more expensive. The cost of transportation has also increased, as priority has been given to transporting tourists, leaving the transportation of essential goods for the local community in the background.	Import of daily commodities using available space on boats and road transport, when available.
Governance weakness due to corruption and violation of	The implementation of new productive models, such as mass tourism, can exclude the community, generating	It is essential to maintain good communication with the communities, plan

regulations and agreements	economic inequalities and allowing only a few to benefit. This is aggravated by the violation of existing agreements, which highlights the urgency of a land-use plan that defines sustainable and equitable actions for the development of the region.	strategically, facilitate participation, and manage land effectively. It is also important to determine carrying capacities, design adequate tourism infrastructure, have a control and surveillance system, and promote education and awareness of standards and agreements.
Loss of protected forest and ecosystem degradation	Deforestation in the region is worsening due to noncompliance with internal regulations, indiscriminate logging, and burning. The expansion of cattle ranching and poor solid waste management also contribute to this problem. This type of development, lacking community planning, leads to ecosystem degradation and promotes destructive practices such as material extraction. It is urgent to establish sustainable management that involves the community and respects current regulations to guarantee the conservation of the environment.	It is essential to have regulations for hunting use, to promote the reforestation of degraded areas, and to adequately manage marine and terrestrial ecosystems. In addition, the community must be made aware of environmental and social aspects, the right to equality in community processes and decision-making must be guaranteed, and the construction of community training and education spaces must be encouraged.
Socio environmental conflicts due to uncontrolled crop expansions	Lack of knowledge about land boundaries generates community and family conflicts due to uncontrolled crop expansion. This	It is important to delimit the territory over time, look for alternatives to technify crops, and ensure clarity between landowners and the

	unplanned expansion contributes to the loss of forest and wildlife species by destroying natural habitats. It is essential to promote education on territorial boundaries and adopt sustainable agricultural practices to resolve these conflicts and protect local biodiversity.	Community Council on delimitations. Decision-making must be adjusted to the territory, infrastructure must be controlled, and awareness must be raised about reducing the use and extraction of animal and forest species. In addition, community assemblies should be held to sign agreements and have community overseers to ensure the integrity of the territory.
Habitat fragmentation and erosion	The use of inadequate fishing gear and the exclusive dedication to tourism have neglected the agricultural sector, causing environmental impacts due to the introduction of livestock and crops into the territory. In addition, unfinished works contribute to the degradation of the environment. It is essential to adopt a balanced approach that takes into account tourism and agricultural activities, and to promote sustainable practices to protect the environment.	It is essential to promote responsible fishing, monitor the animals, and plant more native trees and fruit trees. Training should be supported through community projects and sustainable tourism should be encouraged without losing land. Decisions should be made in conjunction with the community or organizations, coordinating and replicating information. In addition, the works must be completed, serve the entire community and not cause environmental impact.
Increase in pollution and food insecurity.	Environmental contamination and increased tourism make the food basket more expensive. The	It is important to develop campaigns to prevent pollution and work together with the community. Tourism

	distribution of benefits generated by tourism is affected, as some families may take disproportionate advantage of these resources. In addition, egocentrism in the community hinders consensus and equity in benefit sharing, underscoring the need to establish mechanisms to ensure sustainable environmental management and fair distribution.	should be promoted fairly, the concept of equity should be clearly understood, and an altruistic attitude should be fostered, avoiding selfishness and thinking more about others.
Socio environmental impacts due to unsustainable tourism	The impacts of increased tourism are significant, including increased consumption of water, energy and fuels, as well as pollution of the sea, beaches and forests, and noise pollution. The felling of trees contributes to the release of carbon and the reduction of water resources, causing the loss of habitats and animals. In addition, the high flow of tourism generates social and cultural impacts that alter the dynamics of local communities. It is crucial to address these challenges to ensure sustainable tourism development that minimizes negative effects on the environment and society.	To promote sustainability, it is essential to create alternative energy programs, such as the construction of briquettes for cooking and the development of electric-powered airplanes. In addition, encouraging rooftop production and home gardens, together with an agricultural management plan and crop rotation, contributes to food security. In addition, community waste management policies should be implemented and the carrying capacity of tourist sites should be regulated to protect the environment and ensure responsible use of resources.

Training and capacity building	Human actions have put the region's food security and biodiversity at risk due to the adoption of agricultural practices foreign to the territory, which has compromised local production. This has led to the loss of the community's cosmovision and collective roots, weakening community organization and leadership. Outdated information and the lack of accurate conclusions about the necessary works limit the community's ability to make effective decisions. There is an urgent need to adopt an approach that respects local practices and strengthens community organization to achieve sustainable and inclusive development.	To promote sustainable development, it is crucial to train in sustainable land use practices and strengthen environmental education from childhood. This involves supporting traditional practices with local knowledge and designing training models aligned with community priorities. In addition, it is fundamental to guarantee installed capacity and strengthen local leadership, ensuring that leaders are informed and prepared to make decisions on the community's priority works.
Provide alternative livelihoods to the agents of deforestation	Environmental devastation is compounded by harmful practices that threaten biodiversity and ecosystem health. Indiscriminate hunting and forest clearing have led to a drastic reduction in regional fauna and flora. In addition, the use of unsustainable fishing gear, together with the accumulation of solid waste and the dumping of garbage into the sea,	it is essential to empower the community and explore alternatives that promote responsible and sustainable use of the territory. This implies managing each of the components of the environment in a way that guarantees the long-term stability of resources, thus ensuring the well-being of future generations.

	deteriorate water quality and threaten aquatic life. The application of toxic chemicals in agricultural production contaminates both soil and water, affecting the health of communities. In addition, inappropriate tourism, which exceeds the carrying capacity of ecosystems, has a negative impact on the environment and on the quality of life of residents. It is imperative to establish effective regulations and promote sustainable practices to protect biodiversity and ensure a healthy future for generations to come.	
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2.2.5 Other Stakeholder Impacts

In general terms, the expectations throughout the project development are positive for all the stakeholders. Nonetheless, potential negative impacts must be assessed in order to identify mitigation measures to diminish and neutralize them.

For funders the main risk is that the project will not be eligible for VERRA, which will rebound in economic losses. For promoters and partners this experience will not count as a successful case, but most importantly it will be a damage to the trust between them and the local community.

This impact can only be managed by assuring the technical support to Riscales Community Council expecting for a good process of learning to adopt and fulfill all the process and requirement needed to be validated by VERRA.

Finally, problems with governance and corruption may occur, and this can misslead to a relationship with the other stakeholders. For this, ensuring clear communication, transparent information and consensus in assemblies are important.

2.2.6 Community benefiting from project

The project is developed within a poorer and vulnerable population. According to the National Bureau of Statistics (DANE), Riscales' inhabitants are 45.25% of Unsatisfied Basic Need, of which 8.11% suffer from extreme poverty. They also have a huge gap in basic services such as health, sanitation, continuous electricity services, and education among others. In most of the cases, the agricultural production is for self-sufficiency and the small surplus is locally merchandized. Although there is a significant increase of production volume, the lack of training and transportation costs; do not allow a profitable marketing of agricultural commodities.

Considering the percentage of the population below the poverty line and their high socio-economic vulnerability, the Community of Riscales has a low tolerance to risk, and this entails low adaptability to changes. As expressed above, the project is promoting the creation of capacities for the generation and implementation of new activities focused on the improvement of current productive chains, avoiding the exploitation of forest resources in an unsustainable way. The revenues derived from the project also improve inhabitant's well-being and trigger important social investment at community level, not only for gain (just a few families).

In compliance with Decree 1745, the Afro Colombian communities of Los Riscales General Community Council, in 2002 achieved the recognition of collective ownership of more than 31,000 ancestral hectares, under the legal denomination of Afro-Colombian Community Lands. Besides due to their ethnic status the communities have the right to self-determination to freely determine their political status and freely pursue their economic, social, and cultural development. Due to tradition and heritage, each family within the collective territories has usufruct rights that are respected by other families. According to Law 70 and Decree 1745, delineation of these areas is a function of the Community Council Governing Board. Thus, one of the planned project activities is to delineate family-owned areas, which will help to clarify family ownership and define the collective areas (generally forests) that are governed by land use agreements.

In addition to the above, lands belonging to the communities cannot be sold, transferred, or have liens set upon them. The community lands are autonomous and have their own governance structure. Project Zone is governed by Riscales Community Council. According to Law 70, the Afro-descendant communities have clear rights to their lands and forests, as long as the latter get managed according to their ecological function. Moreover, ILO Convention 169, article 15 also provides a legal safeguard for the communities on their right to use, manage, and conserve the natural resources present in their territories. The government has recognized that the last right to use or not use the forests in the REDD+ territories belong to the communities. Community

members have rights to claim that their activities will or did generate the project's climate benefits.

In addition, the agreement signed between the afrocolombian communities of the General Community Council Los Riscales of the municipality of Nuquí, establishes a legally binding commitment to maintain the activities of the REDD+ Riscales project and demonstrate its longevity. This agreement was formalized in an assembly held on February 20, 2018, where collective rights, environmental protection and the importance of active community participation in the implementation of the project, aligned with the Constitution and national legislation, were discussed. The communities guarantee that they will remain active in the implementation of the project for thirty years, starting April 1, 2014, with verification every three years. In addition, an Operational Committee will be established to coordinate and supervise activities, thus ensuring continuous and effective collaboration in the management of natural resources and the sustainable development of their territory (Annex 56. Commitment agreement signed between the Afro Colombian communities of the General Community Council Los Riscales of the municipality of Nuquí, in the framework of the implementation of the REDD+ Riscales project in the collective territory where the Afro Colombian communities live).

2.2.7 Actions to encourage the participation of local communities in the project

All of the REDD+ project activities are designed to ensure that vulnerability is reduced and benefits accrue to the most marginalized and vulnerable groups, including, for example: strengthening land tenure for these groups and reaffirming use rights over natural resources; developing alternative economic activities to reduce financial vulnerability; protecting natural resources to reduce environmental vulnerability; and increasing governance capacity enhances the relationship and contact with other institutions, which reduces the vulnerability of the community.

Additionally, the project activities are focused at the family or household level and decisions are being made at a local level, by township committees ("comités veredales") and zonal boards, which guarantee that marginalized and vulnerable groups (women, children, and elderly) will benefit and be involved in decision-making and benefits distribution.

Priorities for social investment (e.g. health centers and schools) will be based in areas with the greatest need. In order to identify community groups that are marginalized and/or vulnerable, the Consultant team based on DANE reports, Municipality Development Plan 2016-2019, field visits and secondary information carried out an assessment in regard to socio-economics of the Community of Riscales. According to

analysis information the community of Riscales are economically vulnerable, the data show net monthly incomes of \$246.000 (Colombian COP), 45.83% of the population has Unsatisfied Basic Needs and 8% suffer from extreme poverty.

Barriers that could prevent the most marginalized and vulnerable groups from participating in the project have been identified: (i) members of the community are not able to attend meetings either because they do not have access to transportation or because they are unable to forego daily subsistence livelihood activities; (ii) some may not have training for specific jobs for productive activities; (iii) others might not be able to access benefits due to financial, educational, and other constraints.

There may also be specific barriers for women, for example: for those who want to engage in productive activities traditionally undertaken by men, or those who do not have the approval or support of their partners to attend meetings or trainings. Additionally, the low level of education in the communities may be a barrier to ensuring new opportunities for a significant number of people.

To ensure that benefits (including employment opportunities) reach women and the most vulnerable and/or marginalized people in the community, the community Council Asamblea General del Consejo Comunitario will endorse and implement the Benefit Sharing Mechanism that has, as a key component, the selection of beneficiaries based on clearly established criteria. Benefit distribution plans for REDD+ projects with the Communities are rooted in locally developed development plans.

To consider these plans as legitimate, the evaluation must be developed with broad community participation. Once the key activities for the benefit distribution plans are agreed upon, the next key step is to determine who will be directly involved in implementation. This section of the distribution plan is the place to formally define equal opportunities for all community members.

Prioritization of activities to assure that vulnerable or marginalized community members are able to be part throughout the project, are presented as follows:

- The project will provide transportation needed to attend project meetings, and other stipends, particularly for those who set aside basic daily subsistence activities to attend meetings.
- The township committees “veredales” and Zonal Boards will also have clear information about the project activities and have full participation in any decision-making, including individual cases that require special attention.
- The project is ensuring the most vulnerable groups have access to training that enhances their capacity to participate in productive chains.

- In cases where families do not have clear usufruct rights, the Community Council will advance procedures for assignment of such rights.
- The selection of personnel will be based on clear procedures that ensure equal opportunities for employment for vulnerable and marginalized groups; and
- The project considers the household as the basic unit of intervention and has analyzed the different roles of men and women within the productive processes in order to address the needs of men and women differently and improve conditions within households.

2.2.8 Local Stakeholder Consultation

The identification of stakeholders was carried out following the methodology of Mitchell, Agle and Wood (cited by Falcao & Fontes 1999), which develops a coherent methodological sequence to define who is considered? and who is not? a stakeholder.

The Riscales REDD project is an initiative with a long-term action horizon (30 years), which is currently in the early implementation phase. In accordance, the stakeholders that currently play a leading role in the project were identified, as well as those that are expected to be involved in the long term.

The process of stakeholder identification was initiated with the communities dwelling in the area, and legally owning the land. Also, the owners and operators of lodges and tourism services in the area could be relevant stakeholders too, as they demand a large part of the agricultural produce, and timber.

The indigenous and Afro communities bordering Los Riscales could also be stakeholders of interest. The following table (see table 9) presents the list of collective territories of indigenous and Afro communities bordering Los Riscales.

Table 8. List collective territories bordering Los Riscales

COLLECTIVE TERRITORY TYPE	NAME
Afro Community	CUEVITAS
Indigenous Community	RÍO NUQUÍ
Indigenous Community	RÍO PANGUÍ
Indigenous Community	RÍOS JURUBIDA-CHORI Y ALTO BAUDÓ
Indigenous Community	RÍO PAVASA Y QUEBRADA JELLA

The organizations that are part of the Gulf of Tribugá Environmental Management Board were also identified as potential stakeholders. This Board is made up of Los Riscales as the ethnic-territorial authority, the Municipality of Nuquí as the municipal authority, CODECHOCO as the environmental authority, AUNAP as the fishing authority, community organizations and technical support organizations, such as research centers and ONG's. In this roundtable, the competent actors interested in the social, environmental, and economic development of the Nuquí territory are brought together to make decisions on the planning and management of the DRMI's coastal marine territory.

Other potential stakeholders are the organizations that have implemented or are implementing initiatives in the territory of Nuquí, for example: INVEMAR, MarViva, Conservation International, WWF, TNC, CVS, Natural Heritage, ICCO Cooperation, Mano Cambiada and UNDP, Fondo Acción and CI⁵. The Ministry of Environment and Sustainable Development, the Ministry of Agriculture and Rural Development, the Ministry of Commerce, Industry and Tourism of Colombia and IDEAM are potential national stakeholders. Finally, potential investors and buyers are stakeholders of interest.

From this universe, the primary, secondary and tertiary stakeholders of the Los Riscales REDD+ project were identified. The difference between these stakeholder categories is that for the primary stakeholders, a constant management strategy is needed for all issues. For secondary and tertiary stakeholders, a specific management strategy is used for determined issues. The primary stakeholders of the REDD+ Los Riscales project are the 9 communities that make up Los Riscales: Termale, Partado,

⁵ The Minga Fund is a commitment by Fondo Acción and Conservation International Colombia (CI) to ensure the sustainability of the protected areas in the Colombian Pacific, one of the most biodiverse places in the world. Home to more than 1,400 species, including the country's most preserved mangrove forests and the largest humpback whale nursery in the region. To develop the Minga Fund, Fondo Acción and CI worked together with the Ministry of Environment and Sustainable Development in Colombia, the regional environmental authorities in Codechocó and CVC Asocars and the community councils in **Riscales** (from Nuquí, in Chocó), La Plata and Chucheros (both from Buenaventura, Valle del Cauca).

Jurubirá, Jovi, Coquí, Panguí, Arusí, Nuquí and Tribugá. And the secondary stakeholders are the entities that make up the Environmental Management Board of the Gulf of Tribugá. The tertiary stakeholders are all the others that could have some interest or specific relationship with the project.

For the time being the stakeholder management actions carried out within the framework of the REDD+ project have concentrated on the primary stakeholders, due to their importance for the design and early implementation phases of the project.

Accordingly, several primary stakeholder management actions have already been carried out as described below and a strategy for the future management of each stakeholder category will be designed and implemented to ensure project development on a sustainable basis.

2.2.9 Local Stakeholder Engagement

Within the framework of its institutional functions and resource possibilities, ICCO Cooperación will continue to support Los Riscales for the implementation of the REDD+ project. Emphasis will be placed on continuing joint work for the management and implementation of new investor resources and sales of carbon certificates. The communication mechanisms used during the long history of joint work between ICCO Cooperación and Los Riscales have given good results, therefore, they will continue to be used and will be improved or strengthened as needed. Also, if necessary, new communication mechanisms will be jointly designed and implemented.

The project will design and implement a strategy for the future management of the different stakeholders, with the purpose of ensuring the development of the project on a sustainable basis.

Project implementation will count with a benefit distribution mechanism and budget oversight, that ensure that payments is made according to the project's objectives ensuring transparent processes agreed upon with the investor, the communities and individual stakeholders/ community members. They will be in continuous contact with the governing boards of the community councils. All fundamental decisions regarding REDD+ development will be taken by the governing boards of the councils or by a smaller designated group with the authority of the council.

An Implementation Framework Agreement will be executed with the project investor, which will describe measures needed and taken to ensure that the project proponent (Los Riscales) and all other entities involved in REDD Riscasles design and implementation, are not involved in harassment or discrimination, including discrimination based on gender, race, religion, sexual orientation, or other habits.

It is important to highlight that the Los Riscales community council is recognized as a key organization for community processes in the Gulf of Tribugá, therefore, they are part of the dialogue tables with local institutions such as the Mayor's Office and the Government of Chocó and environmental authorities. Such as CODECHOCO, PNN and FONDO ACCION in the framework of the implementation of the LA MINGA Fund in the Gulf of Tribugá.

2.3 Environmental Impact

2.3.1 Biodiversity Risk and Mitigation Impacts

2.3.1.1 Existing Conditions

Colombia, and particularly the region within which the project is situated, is renowned for its richness in biodiversity. While a wealth of knowledge exists with respect to its unique diversity including the many endemic species it is important to consider as well that in depth knowledge of species dynamics and ecosystem function at landscape scales is still limited, as is detailed information on biodiversity at local project-level scales, in many cases.

Regional studies provide information related to known ecosystem classifications and attributes including forest structural attributes, species richness, and levels of endemism in the broader Chocó Darién bioregion. Data which are specific to project zone have been identified, to the best degree possible, through local knowledge and reports. Some functional attributes of biodiversity such as nutrient cycling and water purification are addressed in Section 2.3.1.2, as they relate to ecosystem services, HCVs, and climate.

Owing to several factors including its equatorial position, great geographic variation from coasts to cordillera to the Amazon basin, Colombia has been declared as megadiverse, along with 16 other countries globally, for containing what has been estimated to be 70% of global biodiversity (UNEP-World Conservation Monitoring Center). Historical isolation from the Amazon due to the Andes Mountains resulted in the evolution of new species (See Annex 14 National state of environment report). In the late Pliocene approximately 3 million years ago, the Great American Interchange occurred when volcanic activity caused the emergence of Panamanian isthmus, connecting of South and North America. This has also contributed substantially to Colombian biodiversity due to the migration and related interchange of species.

Colombia is ranked second in the world in terms of the commonly considered gene, species and ecosystem levels of biodiversity organization. High rainfall, tropical conditions and isolation (topographical separation of the Amazon basin) contribute to

the notably high biodiversity within the Chocó-Darién Bioregion Colombian Pacific Region. The Pacific Region within which the project is situated is considered to have 831 bird species, 195 amphibians, 167 mammals, 210 reptiles and 5,124 plant species (see Annex 15 State of Renewable Natural Resources and the Environment Continental Biodiversity Component).

2.3.1.2 Terrestrial Ecosystem at the Project Level

The project zone is located in the Tropical Moist Forest Grand Biome, and within the Chocó-Darién Moist Forests bioregion, a series of ecosystems which are located along the length of the Colombian Pacific coast, southeast Panama and a segment of the Colombian Caribbean Coast, and a segment of north-western of Ecuador. Ecosystems found with the Chocó-Darién bioregion include mangroves, swamps (ciénagas), flooded forest, as well as dry, wet and cloud forests and paramo at elevation.

2.3.1.3 Species at the Project Level

Due to its remoteness and limited resources at the local level, only a small fraction of the more than 6,500 species known to occur in the Colombian Pacific Region have been documented as occurring on the project site or in the project zone. Species documented in the Pacific Region include 831 bird species, 195 amphibians, 167 mammals, 210 reptiles and 5,124 plants (see Annex 16, IGAC 2000, Ecological Zoning of the Pacific region). In addition to data available at the regional level, the World Wildlife Fund (Walschburger, Hurtado Guerra, Romero Ruiz, Rosas Foschi, Suárez, Sánchez & Gómez 2008) compiled data on species richness (e.g. p. 146, 153) and endemism per forest types in the Chocó-Darién Bioregion with which the project is situated, for plants, butterflies, amphibians, birds and mammals. These are listed in Table 9 for forest types specific to the Colombian component of the Chocó-Darién Bioregion. The data provides insight into the very significant levels of species richness and endemism likely to be present to a large degree in the project zone.

Table 9. Species richness and endemism per forest types in the project region. Source: Prepared by the author based on Biological Representativeness, anthropic transformation of the landscape in the Chocó-Darién Ecoregional Complex and its more functional fragments for conservation (2008).

Criteria	Mangrove	Humid lowland forests: subject and not subject to flooding
% original forest remaining	73	41
Richness: plant species	563	3068
Endemism: plants	11	508
Richness: butterfly species	445	279
Endemism: butterflies		21
Richness: amphibians	11	153
Endemism: amphibians	5	71
Richness: birds	108	704
Endemism: birds	18	63
Richness: mammals	134	211
Endemism: mammals	6	11

A substantial number of species known to occur in the project zone are documented in territorial and forest management plans.

In 2018 began a partnership between Los Riscales with Instituto de Investigaciones Ambientales del Pacífico- IIAP to implement with former hunters a community-based feline monitoring strategy to protect them. A joint strategy was designed to identify frequent visual encounter sites, establish sighting dates, document evidence of their presence, and construct maps of probable mobility routes. The six most experienced hunters were involved as co-researchers and trained in photo-trapping, track printing and directed sightings, and a community monitoring booklet was published, thus initiating a powerful process of transforming local awareness of the role of felines⁶.

Mangrove forests provide critical habitat for the life cycles of many species and support much of the diversity of species encountered in the area. They play an important role in filtering contamination and a natural form of soil erosion control and

⁶ <https://iiap.org.co/noticias/iiap-frena-muerte-de-felinos-vinculando-a-cazadores-de-nuqui-en-una-estrategia-de-monitoreo-comunitario-para-protegerlos>

retention. Mangrove exploitation in general tends to be concentrated around community epicenters. Mangrove forests are a significant tourist attraction and play a crucial role in supporting the commercial fishery. They are also sources of firewood, charcoal, and material for the construction of local dwellings as well as fishing boats and gear. Firewood cutting is the most significant use but only fractionally significant compared to logging for commercial purposes. The degradation of mangrove forests creates impacts that pertain additionally to adjacent dry land forests in the project area and zone. Increased scarcity of resources previously available in mangrove ecosystems near settlement areas has resulted in greater exploitation of dry land forests.

Description of the design and implementation to avoid damage to the ecosystems on which local stakeholders depend

The mangrove recovery project in Nuquí was designed and implemented with the active collaboration of the local community. The native mangrove species used for restoration were: red (*Rhizophora mangle*), white (*Rhizophora aff. harrisoni*), salty (*Laguncularia racemosa*), jeli (*Conocarpus erecta*), happy (*Avicennia germinans*), piñuelo (*Pelliciera rhizophorae*) and nato (*Mora oleifera*). This project focuses on enrichment planting using direct planting, and seedlings germinate in nurseries. These practices not only seek to recover deforested areas, but also to strengthen the link between the community and the ecosystem by promoting the responsible use of natural resources.

Local inhabitants, including woodcutters, “piangüeras” (women who collect bivalves) and fishermen, were involved in specific mangrove recovery activities, providing them with recognition and incentives. This fostered a change of perception within the community, transforming woodcutters into role models for their role in restoring activities in degraded areas. In addition, the inclusion of schools’ students in the planting activities helped to increase awareness and sensitise children to the importance of mangrove conservation. In addition, the inclusion of schools’ students in the planting activities helped increase awareness among children of the importance of mangrove conservation.

The workshops consolidated participants' commitment to conservation standards, ensuring better compliance with environmental management processes. As nursery reforestation activities for restoration and “mingas” or “mano cambiadas” (a meeting of friends and neighbors to do some free work together to collectively benefit the community) became regular events, they generated greater interest and awareness of mangrove conservation and its crucial role in the ecosystems and the community's well-being.

In 10 collective construction workshops, the local community agreed on a guideline to avoid damage to the ecosystem according to its zonification:

Management guidelines for sustainable use zones:

1. Permission must be requested from the board by persons “outside” the local council who want to
2. extract natural resources (for domestic or commercial use)
3. Do not cut trees less than 18 centimeters or 6 inches for firewood or less than 33 centimeters or 13 inches thick for sawing
4. Hunting of iguanas is prohibited on the dates established by each local community council
5. The minimum size for capturing iguanas is 60 centimeters
6. Mangroves that are producing seeds cannot be cut
7. Only piangua over 5 centimeters can be collected
8. The use of slingshot, dynamite, barbasco, seine or any other illegal gear in the estuaries is prohibited
9. Artisanal fishing (hand line) can be carried out in the estuaries
10. Obtain the maximum amount of products from the trees cut
11. Rotation areas must be established for the use of piangua
12. Piangua can only be harvested during low tide
13. Pregnant females cannot be hunted or collected or with eggs
14. You cannot damage the house of the piangua or the crab (you cannot pull out the roots, nor use a shovel or
15. crowbar)
16. It is forbidden to cut down the mangrove to establish crops or adapt the area for housing
17. It is forbidden to cut down mangroves on the banks of rivers and estuaries

Management guidelines for recovery zones:

1. No mangrove species may be removed for ten years (firewood, piangua, crab, and iguana, among others)

2. Spilling fuel and littering is prohibited
3. Fishing with a smooth trammel net and a rifle is prohibited
4. Mangrove resources may only be used for medicinal purposes
5. Cutting down mangroves to establish crops or adapt an area for housing is prohibited
6. Reforestation and piangua repopulation activities must be carried out
7. Environmental education and ecotourism activities are permitted.

Management guidelines for preservation zones:

1. The extraction of any species, such as firewood, piangua, crab, iguana and babilla, among others, is prohibited
2. It is prohibited to cut down mangroves for planting crops and for the adaptation of areas for housing
3. Mangrove resources can only be used for medicinal purposes
4. Environmental education activities and tourist tours can be carried out in the mangroves

As the community relies on these common pool resources they agree on different value-based norms. These norms play a crucial role in successfully managing shared resources as they influence user behavior by establishing social expectations and creating incentives to cooperate and ensure the long-term sustainability of the resource through adherence to community-developed rules and monitoring mechanisms, rather than relying solely on external regulation. Table 15 in the Annex 20 Plan de Manejo del Manglar details these norms and their implementation, including "negotiation spaces" were established with the aim of formalizing management guidelines, constructed in a collective and participatory manner, and of generating agreements. Conflict resolution is carried out through negotiation at the so-called "Mangrove Table" which includes representatives from the minor Councils.

2.3.2 Treats of Biodiversity

The most important threats to biodiversity are the identified deforestation drivers which are conversion of forestland to cropland for subsistence farming, conversion of land to pastures, conversion of forest land to settlements (mainly ecotourism) and logging of timber (mostly fuelwood and commercialization). As well known, these activities have negative impacts that mainly affect: (i) structure of project area; (ii) forest ecosystems (reduction of total intact forest area) (iii) fragmentation of intact

forest ecosystems; (iv) degradation of forest structural attributes; and (vi) disruption of natural species composition (ecosystems function and its ability to maintain biodiversity). For this purpose, the project will use some elements and recommendations, derived from the conclusions of the Concepts document and Methodological Guide for the Integrated Management of Coastal Zones in Colombia. Manual 1: preparation, characterization and diagnosis⁷ (Alonso, and others 2003) and the Regional Analysis Report of the North Pacific Gulf of Tribugá and Gulf of Cupíca⁸ (2020).

2.3.2.1 High Conservation Values

HCV Resource Network guidance (See Annex 23) for HCV assessment was consulted for the identification of project HCVs. This guidance recommends that the intensity of HCV assessment reflect the nature of the project. For projects presenting a lower risk of negative impact to HCVs, i.e. conservation-oriented projects such as REDD+, a lower intensity of assessment is appropriate versus that for resource extraction-oriented projects. With a focus on reducing threats to the degradation of natural forest structural attributes and landscape connectivity, this project presents a low risk to biodiversity HCVs.

A stepped approach was used which first considers reference scale information available at the national level for Colombia, the Colombian Pacific Coast Region. At these levels as noted previously there is ample documentation available with respect to the very high significance of the region in a global context with respect to species richness as well as threatened and endemic species.

At the project level, field identification of species presence is significant but nowhere near complete. Information from territorial and forest management plans has been utilized to help with determining species related HCVs, and Humboldt biodiversity plots as served to complement HCV information relevant to the project and the coastal region. According to the last report (June 2016), Humboldt Institute already has over 1.300 records in regard to flora composition in a plot located in tropical rainforest of the Colombian Pacific. This information will be supplemented over time through monitoring plan activities and continued participatory and consensus agreements with local communities. Given the incomplete nature of information available, HCV identification has been undertaken with consideration of the precautionary principle. That is, where there is a lack of complete information, but reference scale data

⁷ <http://www.invemmar.org.co/redcostera1/invemmar/docs/1382mizc.pdf>

⁸ https://www.anla.gov.co/documentos/biblioteca/reporte_analisis_tribuga.pdf

suggests a strong probability of the existence of high conservation value, HCV is assumed to occur.

2.3.2.2 Positive Biodiversity Impacts

Demonstration of positive biodiversity impact is accomplished by comparing the expected project impacts as identified in biodiversity conditions predicted in the without-project scenario. This is a comparison of the project scenario conditions over time to projected biodiversity conditions that would have existed without the project. The contribution of each project activity area toward anticipated biodiversity impacts is summarized below. As explained in the preceding section, the project is located in HCV zones of the Chocó Biogeographical Corridor of Colombia. The project promotes the conservation of these areas with HCV that without the project would continue to be affected by deforestation and forest degradation.

As noted above, reduced deforestation and forest degradation will result in the improved maintenance of forest biodiversity and in many cases the recuperation (through natural regeneration) of forest biodiversity attributes as compared to conditions in the without-project scenario. Some of the identify improvements are:

- Increase in the amount (measured in hectares) of intact or semi-intact forest vegetation.
- Enhancement of forest species composition and structural attributes including crown closure, height, diameter, and density, which better reflect natural conditions and support natural habitat for native fauna.
- Continuation of functional biodiversity attributes including ecosystem productivity and nutrient cycling, water purification and reduced erosion, and reduced vulnerability to invasive species.
- Recuperation of landscape connectivity which contributes to processes including seed dispersion, reproduction, gene flow and associated capacity to adapt to climate change.

Together these changes correlate to a net biodiversity benefit for flora in the project area and provide habitat conditions which are conducive to the well-being of a greater number of faunal species than would be the case in the without-project scenario.

2.3.3 Strengthen governance as a mechanism to mitigate impacts

The project projects several net benefits to the environment by working with the communities to develop and update forest and land-use management plans. Restricting productive activities to designated areas through land-use zoning, and

regeneration of exploited species will allow the recovery of the forest area and controlled timber extraction.

In the without-project scenario, the ongoing trend in lack of support and resources for land-use planning is likely to continue. The support for these processes was not available in the baseline scenario and not likely to become available given current trends in commitment and resources. Resulting improvements to natural forest ecosystem composition, structure, and function at the landscape level in the project scenario, however, equate to a clear environmental benefit.

In addition, the project provides resources for the demarcation of physical boundaries. Without the project, there is no sign of support for this type of initiative. Boundary demarcation will promote awareness and a reduction of infringement on private lands and conservation reserves.

It is expected to continue strengthening governance within the communities, as project activities continue to be implemented with the active participation of all community members. Mainly, through the implementation of the zoning proposed in the Ethno Development Plan (See Annex 17), as part of the project activities.

2.3.4 Training and Capacity Building

Improving training and capacity building will ensure that individuals in the project community are capable and train to effectively manage the REDD+ project activities. The annual report of UICN (2013)⁹ and specialized literature¹⁰, indicates that when building local management capacity, it is possible to achieve greater success in forest conservation initiatives and local leadership would have been realized than in the without-project scenario. Success at reducing deforestation and degradation levels leads to greater quantity of intact forest, including structural, functional attributes, and correlated to environmental benefits.

Local management capacity is improved in the project scenario by investment in environmental education that raises awareness about the importance of conservation of natural resources. In this way, the project leads to an increase in short-term awareness of the environment and longer-term commitment toward sustainable management and conservation of forests. Because the project activities have been designed primarily to reduce the levels of deforestation and forest degradation in the

⁹ <https://portals.iucn.org/library/sites/library/files/documents/IUCN-2014-017-Es.pdf>

<https://www.cima.org.pe/files/images/publicaciones/pdf/CIMA-2013-Modelo-FOCAL.pdf>

¹⁰ <https://www.iucn.org/es/news/america-del-sur/201902/que-es-la-gobernanza-y-como-entenderla-para-fortalecer-la-conservacion-del-patrimonio-natural>.

project area, the estimate of impact on biodiversity is mainly related to changes in the vegetation cover of the forests. This strategy is parallel to the proposal of Richards (2011)¹¹, who consider that biodiversity change is related to changes in vegetation cover, and Pitman (2011)¹², who indicates that the size and connectivity of Forest ecosystems are related to the levels of natural ecological function. Pitman analyzes that biodiversity is the center of the project's activities, increasing the quality and quantity of natural vegetation, by reducing Anthropogenic impact and maintaining HVC. Therefore, the conservation of forest areas in the project area is sufficient to affirm that there is a net positive impact on biodiversity. The changes in forest conditions also reflect direct impacts on biodiversity and the quality of species' habitats.

By improving the natural condition of forest ecosystems and reducing anthropogenic impact through the reduction of forest deforestation, the project substantially improves the maintenance and protection of biodiversity High Conservation Values compared to the without-project scenario.

While it is not possible to guarantee the outcome of HCVs on a species-by-species level due both to the impracticality of monitoring each of the many HCV species likely present, and the influence of factors outside the control of the project such as habitat destruction outside the project zone, it is clear that the project provides improved conditions, including species habitat, at a broad level for HCVs throughout the project area and zone.

On a more specific level it is possible to say that the HVC will be improved due to the enhancement of ecosystems functions in the project area. Threatened and endemic species will be protected in comparison to baseline conditions due to improved habitat conditions. Project activities will also provide improved protection of mainland and mangrove ecosystems compared to the baseline scenario. Recovery of landscapes and ecosystems orientated the HCVs. The reduction of anthropogenic impacts increases the primary forest area compared to the without-project scenario.

2.3.4.1 Species used in project

Species selected in the project economic activities are included in the Ethno Development plan and these are: coconut (*Cocos nucifera* naturalized specie from the tropical Pacific islands), açai (*Euterpe oleracea*, native species), vanilla (*vanilla* orchids group, native species), and sugarcane (*Saccharum officinarum*, originated in New

¹¹ <https://verra.org/wp-content/uploads/social-and-biodiversity-impact-assessment-sbia-manual-for-redd-projects-part-2.pdf>

¹² <https://verra.org/wp-content/uploads/social-and-biodiversity-impact-assessment-sbia-manual-for-redd-projects-part-3.pdf>

Guinea). Sugarcane is already commonly used in the project area and the region, and is widely considered to be non-invasive, as well as coconut. Açai occurs naturally and pilots have already been carried out for the development of vanilla small plantations in the project area. Documentation about the non-invasive and/or local nature of these species is kept on file by the Project, and if additional species are considered for use, they will be similarly assessed.

2.3.4.2 Invasive Species

The project will mainly use native species for the productive activities to be implemented as part of the REDD activity, there are no invasive species considered by the project as mentioned in 2.3.4.1

2.3.4.3 GMO Exclusion

Since organic fertilization and pest control methods are the ones which community members are currently accustomed to use, no Genetically Modified Organisms (GMO's) will be implemented by the project. If the project encounters a need for the use of any chemical methods at a future date, then there will be a prior assessment of possible adverse effects and standard operating procedures produced to ensure their safety to the environment and employees. Any chemicals in use and associated safe operating procedures will be made available during subsequent project verifications.

2.3.4.4 Waste Products

Standard operating procedures for identifying, classifying, and managing all waste products resulting from project activities (e.g. agricultural waste, processing facilities waste), will be developed during the detailed design stage of each relevant project activities. These procedures will be implemented, including adequate training of workers, prior to operations commencement and will be made available during subsequent project verifications.

In summary, because of the above, no environmental impacts are identified due to the implementation of the project, and there are plans or mechanisms to mitigate them if they occur.

2.4 Public Comments

On November 14, 2018, the English version of the PDD of the Los Riscales REDD+ project was published on the VCS website, kicking off a public comment period that ran until December 14 of the same year. This period, established by VERRA, was intended to receive comments and suggestions on the PDD from stakeholders, including local communities.

To ensure community participation, the legal representative of Los Riscales was notified of the publication of the PDD, and through him this information was communicated to the leaders of the nine communities that make up Los Riscales See Annex 59 “Acuerdo de compromiso suscrito entre las comunidades negras”.

However, during this public consultation period, no comments were registered in the VERRA system. This information is documented in the files Annex 39. Public comments and Annex 56. Public comments email.

2.5 AFOLU-Specific Safeguards

The ownership of the land or the rights acquired by the people who make up the Community Council will not be affected by the project. The Project proposal is part of the principles derived from the Community ethno-development plan, it is a proposal built, from and with the participation of the community, which will ensure compliance with the safeguards established at the national level for REDD+ initiatives.

With respect to the neighboring communities, no effects on their territories or their collective titles are foreseen, since the neighboring communities also have the same ownership rights recognized by Law 70 of 1993, highlighting that these territories are Unattachable, inalienable and imprescriptible. This regulation has been defined with the conditions, as an instrument to protect collective territories against third parties thus providing a solid security framework for all communities involved.

The target group for this project consists of the Afro-Colombian communities of Chocó, in particular the community councils of Los Riscales, who are fully informed about the project's objectives and are determined to collaborate in its implementation, reflecting their commitment to the development of their community. In 2017, the Los Riscales General Council was composed of approximately 4,500 afronuquiseños, representing around 700 families, organized into nine Local Community Councils: Jurubidá, Tribugá, Nuquí, Panguí, Coquí, Joví, Termales, Partadó and Arusí. In addition, Los Riscales share their territory with the Embera indigenous community and some mestizos, totaling 7,995 inhabitants, of which 2,398 reside in the municipal capital and 5,597 in rural areas.

The REDD+ project approach guarantees the active participation of the communities in all stages of development, from the Project Design Plan (PDD) to its validation and implementation. This ensures that they not only have rights over the projects, but also over the certifications of avoided emissions generated. With this vision, an inclusive approach will be adopted that will allow different groups, including children, youth and adults, to feel welcome to participate. Gender equity will be promoted and outreach

methods will be adapted to the needs of each group. In this way, it is expected to foster a better understanding of the process and contribute to the achievement of the objectives, especially in empowering communities to manage their territories in a sustainable manner.

The project design is based on sustainability principles that ensure that there are no negative trade-offs in terms of food security, land loss, yield loss and adaptation to climate change. Project activities are aligned with the Ethno Development Plan, promoting the sustainable use of natural resources and ensuring that traditional agricultural practices are not affected. To avoid adverse impacts, a participatory dialogue was carried out with the communities to analyze risk-benefit of the project, prioritizing complementary activities that strengthen food security, such as crop diversification and the implementation of good agroforestry practices adapted to climate change (Annex 58). These strategies also contribute to climate resilience and the long-term economic sustainability of collective territories.

The project area is characterized not only by its rich biodiversity, but also by its wide social, economic and cultural diversity. The ethnic composition of the population reflects this diversity, with 77.5% Afro-descendants, 22.5% Embera Indians and a minority mestizo population (Departamento Administrativo Nacional de Estadística [DANE], 2018, National Population and Housing Census). Afro-descendant communities are organized into nine local community councils and have a collective title administered by the Asociación de Consejos Comunitario General Los Riscales (Annex 60 Golfo Tribuga-Golfo Cupica ANLA).

Nuquí's economic diversity is manifested in a mix of traditional and emerging activities. The local economy is mainly based on fishing and agriculture, practiced mostly by Afro-descendant communities. However, the tourism sector is growing, involving both local people and external investors, taking advantage of the region's natural and scenic resources. In addition, conservation and sustainable development initiatives have gained importance, with the active participation of local communities (Annex 17 Ethno Development Plan).

In terms of social diversity, the project area has a marked geographical distribution, with 90.4% of the population residing in rural areas and only 9.6% in the municipal capital. There is a demographic balance in terms of gender, with 51% male and 49% female. However, it is important to note that 50.9% of the inhabitants live in conditions of unsatisfied basic needs, which indicates significant challenges in terms of social development (Annex 60 Golfo Tribuga-Golfo Cupica ANLA).

The interactions between the different stakeholders in Nuquí are complex and multifaceted. Afro-descendant communities manage their collective territories autonomously, but interact in common spaces such as the Regional District of Integrated Management Golfo de Tribugá-Cabo Corrientes. While the rural communities focus on traditional economic activities, the urban and mestizo population tends to be more involved in the service and tourism sectors. Nevertheless, there is interaction between all groups in conservation initiatives and sustainable resource use, reflecting a common interest in the preservation of the natural environment.

During project development, a comprehensive identification and assessment of potential risks and impact to local stakeholders was carried out (Annex 54). Among these risks, potential competition for resources, overexploitation of natural areas and land use conflicts were identified. To mitigate these risks, the project implemented participatory strategies including the creation of local monitoring committees, conflict resolution workshops and training in sustainable resource management. In addition, ongoing participatory mechanisms were established to address any emerging concerns or risks during project implementation, ensuring that communities maintain control over their territories and resources. According to the oral culture of the community, this mechanism consists of directing concerns to the leaders of the minor councils or directly to the legal representative of the General Council, who is expected to provide a sufficient and satisfactory response. During the General Council Assembly, participants can also address questions and concerns regarding the project.

Over time, the communities present in the territory have undergone eventual transformations in the composition of the different groups that make up the territory, although the historical roots of the Afro-descendant communities continue to be predominant. These traditional communities have managed to organize themselves and strengthen their presence in the territory.

The Afro-descendant communities have united under the figure of the ‘Consejo Comunitario General Los Riscales’, made up of: Jurubidá, Tribugá, Niquí, Panguí, Coquí, Joví, Termales, Partadó and Arusí. This organizational structure, protected by Law 70 of 1993, has allowed them to have a stronger and more united voice to defend their territorial rights and visions of development.

In addition to these transformations in ethnic communities, new actors have also appeared on the local scene. The rise of tourism, for example, has brought with it the arrival of tour operators, both local and foreign, diversifying the landscape of interests and perspectives present in the region. The presence of governmental institutions and non-governmental organizations focused on conservation and sustainable

development has also increased, broadening the range of voices and visions that influence decision-making.

On the other hand, social and environmental movements and organizations have emerged as key actors, defending the rights of communities and the protection of the territory's natural resources. In addition, although to a lesser extent, there have been some processes of migration and return that have enriched the population and cultural dynamics of the region.

Overall, these changes reflect an evolution in the composition of the different groups that make up the Nuquí community. While cultural roots remain a central element, there is now greater organisation and visibility of traditional communities, the arrival of new economic and social actors, and a strengthening of institutional presence and citizens' movements. This diverse and constantly changing landscape challenges the community to find ways to articulate its different interests and visions for the well-being and integral development of the region.

This diversity presents both challenges and opportunities for project development in the region. Successful projects require an inclusive approach that considers the needs and perspectives of all local stakeholders, respecting their cultural and economic traditions, while promoting sustainable development that benefits the entire community.

Project consent process to the community of Los Riscales

As discussed in Section 2.2. Local Stakeholder Consultation, the implementation of REDD+ actions in the territory of an ethnic group must ensure the communities' right to effectively participate in decision-making while adhering to the normative framework for the protection of their rights as outlined in Law 70 of 1993. Also, actions implemented in ethnic territories had to take into account the uses and customs of each group involved, as well as respect their own decision-making structures.

This is the reason of using Los Riscales communication structures to reach consensus, and by this ensuring the active participation of all stakeholders, promoting joint planning, and implementing activities, primarily relied on meetings, with oral communication serving as the primary mode of information transmission. This is particularly relevant as local communities are the proposers, owners, and implementers of this project, which will contribute to the reduction of GHG emissions in the long term. Law 70 of 1993 recognizes the right of Afro-Colombian communities and their organizations to participate in decision-making that impacts them, a process that involves consensus and assembly approval. According to this law, Afro-Colombian communities will not consult themselves; they consent at the assemblies. In order to

reach an agreement in an assembly (Annex 57), the General Council convened the 9 Minor Councils on February 22, 2014.

Throughout the process, an atmosphere of open dialogue was fostered, allowing the communities to freely express their concerns and provide suggestions. As a result, genuine consent was obtained, reflecting a commitment from the communities based on clear understanding and without external coercion. Ongoing mechanisms were put in place to ensure that this consent was a dynamic process, allowing them to actively participate in ongoing project decision-making.

On the other hand, it is important to highlight that this project aims to ensure a process of learning for the community, in line with the principles of the other organizations involved. The Developer Joint Project Description & Monitoring Report, V.01, Fondo Acción showcases a team with technical expertise in implementing sustainable land and carbon management projects that involve community participation, particularly in REDD+ projects. The members include experts in forest management, conservation, and climate change adaptation, many of whom have previously worked on similar initiatives in regions with high biodiversity and social complexity and with carbon credit projects. ICCO Cooperation, the promoter and co-financer of Project Developer PDD V 1.0 and V 2.0, has experience in local capacity building, previous work with the Riscales General Council, extensive experience in sustainable rural development, and managing funding. This experience has ensured the successful implementation of the project and the generation of tangible benefits for the participating communities.

The project proponent and partners have implemented strict policies to ensure that there is no discrimination, sexual harassment, or any form of violence in the framework of the project. All ICCO Cooperation partners must follow ICCO's policies as indicated in the contracts and agreements (Annex 61 Additional supports - Finding 14). These policies are based on the principles of gender equality and respect for human rights and are supported by ICCO Cooperation's code of conduct, which includes a zero-tolerance policy for inappropriate behavior. All project staff have received mandatory training on the prevention of harassment and discrimination, as well as on the promotion of an inclusive and respectful work environment. To date, there have been no reported cases related to discrimination or harassment within the project.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

REDD+ Methodology Framework (REDD+ MF) v1.6. – Approved VCS Methodology VM0007.¹³

Title	Version
VM0007 REDD+ Methodology Framework (REDD-MF)	1.6
VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools (CP-AB)	1.1
*AR-TOOL14. A/R Methodological tool. Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities	04.2
*A/R Methodological Tool. Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities	01.1.0
*AR-TOOL12. A/R Methodological tool. Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities	03.1
VMD0002 Estimation of carbon stocks in the dead-wood pool (CP-D)	1.0
VMD0007 Estimation of baseline carbon stock changes and greenhouse gas emissions from unplanned deforestation (BL-UP)	3.3
VMD0010 Estimation of emissions from activity shifting for avoiding unplanned deforestation (LK-ASU)	1.2
VCS MODULE VMD0013 Estimation of greenhouse gas emissions from biomass burning (E-BPB)	1.2
VMD0015 Methods for monitoring of greenhouse gas emissions and removals (M-MON)	2.2
VMD0016 Methods for stratification of the project area (X-STR)	1.2
VCS MODULE VMD0017 Estimation of uncertainty for REDD project activities (X-UNC)	2.2
CDM Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (T-ADD)	1.0
CDM Tool for testing significance of GHG emissions in A/R CDM project activities (T-SIG).	1.0
VCS AFOLU Non-Permanence Risk Tool (T-BAR)	4.0

Table 10. Applicability Conditions

¹³ Disponible en: <https://verra.org/methodology/vm0007-redd-methodology-framework-redd-mf-v1-6>

*The Project did not conduct fieldwork for estimating biomass in shrubs; therefore, the CDM tool for module VDM0001 (CP-AB), in its section 5 part 3, allows to use of information from the literature. Therefore, this module is taken and estimated from information with national values. The change in the organic carbon content of the soil was not measured by direct sampling in the field, a conservative position of the project is to assume its contribution is not significant, so it was estimated with indirect methods with a default value of the literature (IPCC 2003). Finally, this sink is not considered in carbon balances. And the same process is developed for dead wood and litter, with indirect methods available in the CDM.

3.2 Applicability of Methodology

The applicability conditions of methodology VM0007 and its associated modules are detailed in table 12 below.

Table 11. Applicability conditions of methodology VM0007

No.	Module	Applicability condition	Observation
1	VM0007 - REDD-MF	Land in the project area has qualified as forest (following the definition used by VCS) at least 10 years before the project start date.	Condition satisfied. The project proponent has obtained satellite imagery from ten years before the project start date to demonstrate that the land in the project area qualified as forest in accordance with the national definition of forest: "land spanning more than 1 ha with trees higher than 5 meters and canopy cover of more than 30%, or trees able to reach these thresholds in situ" (UNODC).
2	VM0007 - REDD-MF	If land within the project area is peatland and emissions from the soil carbon pool are deemed significant, the relevant WRC modules (see Table 1) must be applied alongside other relevant modules.	Condition satisfied. The project area is not peatland; thus, WRC must not be applied in this case. The project area includes mangrove systems considered significant carbon sinks, especially for their soil with high organic concentrations of organic matter. The Food and Agricultural Organization (FAO) defines peat and organic soils as, "...soils that have more than 50% organic matter in the upper 80-cm". The soil analysis and classification provided by IGAC show that the SOC content does not exceed 50% for any soil class in Colombia's Pacific coast, including the extent of the Los Riscales project area. Moreover, mangrove systems in Colombia that were directly sampled for SOM did not find SOM to be above 50%.
3	VM0007 - REDD-MF	Baseline deforestation and forest degradation in the project area fall within one or more of the following categories: • Unplanned deforestation (VCS category AUDD); • Planned deforestation/degradation (VCS category APD);	Condition satisfied. Baseline deforestation and forest degradation fall in the categories of unplanned deforestation.
4	VM0007 - REDD-MF	Leakage avoidance activities must not include: • Agricultural lands that are flooded to increase production (eg, paddy rice); • Intensifying livestock production through use of feed-lots and/or manure lagoons.	Condition satisfied. The project does not include agriculture on flooded lands or intensification of livestock production.
5	VM0007 - REDD-MF	Baseline agents of deforestation must: (i) clear the land for settlements, crop production (agriculturalist) or ranching, where	Condition satisfied. The Project has deforestation pressures related to crops and pastures; all of these small-scale activities as demonstrated by

		such clearing for crop production or ranching does not amount to large-scale industrial agriculture activities; (ii) have no documented and uncontested legal right to deforest the land for these purposes (unplanned deforestation); and (iii) be either residents in the Reference Region for Deforestation or immigrants. Under any other condition this methodology must not be used.	eligibility. On the other hand, the opening of the forest is developed without any use plan or forest management plan and is the due permission of the environmental corporation. According to the 2014 agricultural census (DANE), the region of the community council of Los Riscas and the municipality of Nuquí in general, the municipality does not have an agricultural infrastructure area that can be classified as territories with industrial-scale activities. According to DANE (2014) only 3 ha meet the condition of agricultural infrastructure, i.e. values between 0.01-0.03% of the total area of the municipality. Regarding the agents of deforestation, according to Gonzalez, et al 2018, the project area is part of zone two of the Colombian Pacific, which is the northern region (bordering Panama), characterized by some high areas with cliffs of the Baudó mountain range near the coast.
6	VM0007 - REDD-MF	If, in the baseline scenario of avoiding unplanned deforestation project activities, post-deforestation land use constitutes reforestation, this methodology may not be used.	Condition satisfied. The project does not promote reforestation activities as post deforestation land use in the baseline.
7	VMD001 - CP-AB	This module is applicable to all forest types and age classes. Inclusion of the aboveground tree biomass pool as part of the project boundary is mandatory as per the framework module REDD-MF.	Condition satisfied; it is mandatory.
8	VMD001 - CP-AB	Non-tree aboveground biomass must be included as part of the project boundary if the following applicability criteria are met (per framework module REDD-MF): Stocks of non-tree aboveground biomass are greater in the baseline than in the project scenario, and Non-tree aboveground biomass is determined to be significant (using the T-SIG module).	NTAGB is included in project area.
9	VMD001 - CP-AB	Belowground (tree and non-tree) biomass are not required for	Below ground biomass (trees) to be included, as allowed by the methodology

		inclusion in the project boundary because omission is conservative.	
10	VMD002 – CP-D	Dead wood shall be included if stocks are greater in the baseline than in the project scenario (in conformance with REDD-MF)	The estimation is not made directly with field sampling, it makes use of procedures and default data proposed by the CDM ¹⁴ . This process takes a percentage value of 6% of the aboveground biomass for upland forest and for mangrove forest a value of 10.7 tCha-1 is applied. Likewise According to BL_UP the Dead wood, the stock change 1/10 for 10 years. With these DW values, and applying the T-GIS, the DW component is NOT significant and therefore not considered in the carbon balances.
11	VMD002 – CP-D	Dead wood shall be included if determined to be significant	Condition satisfied. Dead wood will not to be included as stocks not significant. See section 5. It's not significance for inclusion in the balance sheets is evaluated.
12	VMD005 – CP-W	This module is applicable to all cases where wood is harvested for conversion to wood products for commercial markets, for all forest types and age classes	Condition not applicable: Among the causes of deforestation and degradation identified for the project, the collection of wood for the production of wood products for commercial distribution is not one of the causes identified. Therefore, the module is not applicable.
13	VMD007 – BL-UP	The module shall be applied to all project activities where the baseline agents of deforestation: (i) clear the land for settlements, crop production (agriculturalist) or ranching, where such clearing for crop production or ranching does not amount to large scale industrial agriculture activities; (ii) have no documented and uncontested legal right to deforest the land for these purposes; and (iii) are either resident in the region (reference region—cf. section 1 below) or immigrants.	Condition satisfied. Module is applied to all project activities where the baseline agents of deforestation meet the characteristics mentioned. Applicability conditions 5 above. i)The agents of deforestation are part of the same community and the transition to non-forest use is for small-scale agricultural and livestock activities. II) the opening of the forest is developed without any use plan or forest management plan and is the due permission of the environmental corporation. III) The agents of deforestation are the same communities settled and owners of the collective territory. Firewood collection is one of the drivers of deforestation in the project area. Although this has been important for the community, it cannot be associated with the degradation of the mangrove (main source of firewood) or the loss of the mangrove, since the greatest impact in the transformation of the mangrove is the change in land use from forest to non-

			forest. Likewise, the consumption of this component was measured, identifying that it is 1,254.8 kg per year, and applying the T-GIS, in terms of emissions it is less than 1%, making this source of emissions insignificant and therefore it can be omitted in the carbon balances. However, as a positive impact on the ecosystem and the health of the community, the project will implement eco-efficient stoves that reduce firewood consumption, preventing communities from moving out of the project area for firewood. The proposal is a sustainable management of dendro energy resources. Therefore, the BL-DFW and LK-DFW modules are not applicable.
	VMD0008 - BL-DFW	This module allows for estimating GHG emissions related to degradation from fuelwood collection and charcoal production in the baseline case	Condition not applicable: Firewood collection is one of the causes of deforestation in the project area. Although this has been important for the community, the degradation of the mangrove (main source of firewood) is mainly related to the change of land use from forest to non-forest. The identified firewood consumption is 1,254.8 kg per year, which represents an emissions value of less than 1%, therefore this source of emissions is considered insignificant. Therefore, GHG emissions related to degradation from firewood collection and charcoal production are negligible and the module does not apply.
15	VMD0010 - LK-ASU	Activities subject to potential displacement are the conversion of forest land to grazing lands, crop lands, and other land uses.	Condition satisfied. Project activities are converting forest lands to pastures, crops, and settlements.
16	VMD0010 - LK-ASU	The module is mandatory if module BL-UP has been used to define the baseline and the applicability conditions in module BL-UP must be complied with in full.	Condition satisfied. Module BL-UP is being used. See conditions 11 and 12 above.
17	VMD0012 - LK-DFW	Where fuelwood is collected or charcoal is produced for sale in regional or national market the market effects leakage must be considered using Module LK-ME.	Condition not applicable: The project does not consider fuelwood sales in regional or national markets.

18	VMD0012 – LK-ME	This module is applicable for calculating market-effects leakage from projects that are anticipated to reduce levels of wood harvest substantially and permanently	Condition not applicable: The project does not consider fuelwood sales in regional or national markets
19	VMD0013 – E-BPB	This module is applicable to REDD project activities with emissions from biomass burning and REDD-WRC project activities with emissions from biomass and/or peat burning.	Condition nor applicable. It is important to mention that within the project there is burning for firewood consumption that is different from biomass burning, therefore the VMD0013 module is not applicable. In the project area, none of the applicability conditions mentioned in the module (see section 5 Procedures, of module VMD0013), are carried out in the project area, therefore the module is not applicable.
20	VMD0015 – M-REDD	Strata as defined in the relevant baseline modules are fixed and may not be changed without baseline revision.	Condition satisfied. Strata are fixed
21	VMD0015 – M-REDD	The module is always mandatory. Without application of this module the methodology shall not be used.	Condition is satisfied: the module is applied.
22	VMD0015 – M-REDD	Where selective logging is taking place in the project case: - Emissions from logging may be omitted if it can be demonstrated the emissions are <i>de minimis</i> using T-SIG. - If emissions from logging are not omitted as <i>de minimis</i>, logging may only take place within forest management areas that possess and maintain a Forest Stewardship Council (FSC) certificate for the years when the selective logging occurs. - Logging operations may only conduct selective logging that maintains a land cover that meets the definition of forest within the project boundary. - All trees cut for timber extraction during logging operations must have a DBH greater than 30 cm. - During logging operations, only the bole/log of the felled tree may be removed. The top/crown of the tree must remain within the forested area.	Condition not applicable. The project does not involve selective logging. The module considers applicability conditions, related to felling and burning of trees, none of the selective logging activities take place in the project. The Los Riscas network project does not contemplate the cutting or burning of aerial biomass and does not have established forest management areas for use, therefore there is no applicability of the conditions mentioned in the VMD0015 module.

		- The logging practices cannot include the piling and/or burning of logging slash - Volume of timber harvested must be measured and monitored.	
23	VMD0016 – X-STR	In case of REDD, above-ground biomass stratification is only used for pre-deforestation forest classes, and strata are the same in the baseline and the project scenario. Post-deforestation land uses are not stratified. Instead, average post-deforestation stock values (eg, simple or historical area-weighted approaches are used, as per module BL-UP).	Condition satisfied. See application of this module in section stratification.
24	VMD0016 – X-STR	For peatland rewetting and conservation project activities this module must be used to delineate non-peat versus peat and to stratify the peat according to peat depth and soil emission characteristics, unless it can be demonstrated that the expected emissions from the soil organic carbon pool or change in the soil organic carbon pool in the project scenario is <i>de minimis</i> .	Condition not applicable.
25	VMD0016 – X-STR	In the case of peatland rewetting and conservation project activities, the project boundary must be designed such that the negative effect of drainage activities that occur outside the project area on the project GHG benefits are minimized.	Condition not applicable.
26	VMD0017 – X-UNC	This module is mandatory when using methodology REDD-MF.	Condition satisfied. This module has been used throughout to estimate uncertainties in the project.
27	T-ADD	AFOLU activities the same or similar to the proposed project activity ² on the land within the proposed project boundary performed with or without being registered as the VCS AFOLU project shall not lead to violation of any applicable law even if the law is not enforced;	Condition satisfied. Project activities do not violate any applicable laws. In fact, they require the application of some laws.
28	Combined tool to identify the baseline scenario	Forestation of the land within the proposed project boundary performed with or without being	Condition satisfied. REDD activities do not violate any Colombian applicable law.

	and demonstrate additionality in A/R CDM project activities” T-ADD	registered as the A/R CDM project activity shall not lead to violation of any applicable law even if the law is not enforced.	
29	Combined tool to identify the baseline scenario and demonstrate Additionality in A/R CDM project activities” T-ADD	This tool is not applicable to small - scale afforestation and reforestation project activities.	Condition satisfied. REDD activities are not classified as small scale.
30	CDM Tool for testing significance of GHG emissions in A/R CDM project activities (T-SIG).	This tool is mandatory for the estimates of the sinks considered in the project	Condition satisfied.

3.3 Project Boundary

Table 12. Carbon pools included by the project for reduction and removals of emissions of GHG

Pools	Included	Justification
Above-ground tree biomass	Yes	Major carbon pool affected by project activities.
Above-ground non-tree biomass	Yes	Expected to increase from project activities. Must be included when the land cover under the baseline scenario is perennial tree crop.
Below-ground biomass	Yes	Major carbon pool affected by project activities.
Dead Wood*	No	Potentially affected by project activities.
Litter*	No	Excluded as per VCS AFOLU Requirements.
Soil*	Yes	Potentially affected by project activities. This component is only included for carbon accounting on terra firme forest. Mangrove: According to section A1.13, Common wetland types include peatland, salt marsh, tidal freshwater marsh, mangroves, wet floodplain forests; however, soil organic carbon pools in both the reference and project scenarios have been conservatively excluded. This is explained by the fact that more than 60% of the mangrove areas that are deforested remain as water bodies, and other coverages that do not immediately affect the sinkhole. On the other hand, following IPCC methodological recommendations, it determines that Tier 1 default assumption is that soil CO₂ emissions and removals are zero (EF=0) for forest management practices in mangroves. 4.2.1.3 Soil Carbon (IPCC 2013. Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands)
Wood Products	No	Excluded,

		According to VMD0015: It is conservative in the project case to assume no wood products are produced. See sect 5, step 2.
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*Non-significant pool for mangrove forest

According to the significance analysis of pools, carried out according to the guidelines of the tool: CDM Tool for testing significance of GHG emissions in A/R CDM project activities (T-SIG). The pools that were not significant, according to the procedure defined in the T-SIG, values below 5% of the total contribution of Biomass / C per Ha of the stratum, these were omitted. Those that were significant and that are considered within the methodology were used to account for the total content for the respective stratum.

Table 13. GHG Gases accounted by the project Baseline Scenario

Source		Gas	Included?	Justification/Explanation
Basel ine	Deforestation	CO ₂	Yes	Aboveground and belowground biomass losses resulting from deforestation are included
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Biomass burning	CO ₂	Yes	Aboveground biomass losses as a result of fire are included conservatively, but is not significant
		CH ₄	No	Aboveground biomass losses as a result of fire are conservatively assumed zero
		N ₂ O	No	Aboveground biomass losses as a result of fire are conservatively assumed zero
		Other	No	Aboveground biomass losses because of fire are conservatively assumed zero
	Combustion of Fossil fuels	CO ₂	No	Conservatively omitted
		CH ₄	No	Conservatively omitted
		N ₂ O	No	Conservatively omitted
	Use of fertilizers	CO ₂	No	Conservatively omitted
		CH ₄	No	Conservatively omitted
		N ₂ O	No	Conservatively omitted
Proje ct	Deforestation	CO ₂	Yes	If there is deforestation losses will be accounted for
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Biomass Forest deforestation	CO ₂	No	Aboveground biomass losses as a result of fire are conservatively assumed zero
		CH ₄	No	Aboveground biomass losses as a result of fire are conservatively assumed zero
		N ₂ O	No	Aboveground biomass losses as a result of fire are conservatively assumed zero
		Other	No	Aboveground biomass losses as a result of fire are conservatively assumed zero
		CO ₂	No	Conservatively omitted

Source		Gas	Included?	Justification/Explanation
	Combustion of fossil	CH ₄	No	Conservatively omitted
		N ₂ O	No	Conservatively omitted
		Other	No	Conservatively omitted
	Use of fertilizers	CO ₂	No	Conservatively omitted
		CH ₄	No	Conservatively omitted
		N ₂ O	No	Conservatively omitted
		Other	No	Conservatively omitted

3.4 Baseline Scenario

Under the defined baseline scenario, the project area would be deforested and degraded at existing or historical rates in absence of the project. This scenario would result in significant emissions of carbon dioxide compared to the expected decrease in emissions from project activities under the with-project scenario.

3.4.1 Deforestation Agents

Deforestation agents are those who perform the activities that lead to forest loss. Primarily, these are the inhabitants of the territories who clear forests to change the land use to agriculture, cattle ranching, and settlements (see Table below for more details). Also, external agents contribute to the clearing of forests, by settling down in the project area. In a lesser proportion, members of the communities of Los Riscas fell trees to generate other sources of income. Included in that group are full-time, occasional, or seasonal tree cutters, who combine timber harvesting with other sources of income.

The ability of deforestation agents to impact the forest is related to their mobility and geographical conditions of conversion areas. Table 14 below indicates which mode of transport is used by each agent and activity.

Table 14. Drivers and transportation mode of deforestation agents

Driver	Afoot	Animal	Boat	Motorized vehicle
Conversion of forest to subsistence and productive food crops (agricultural activities)	X	x		
Conversion of forest to settlements	X	x		
Conversion of forests for cattle grazing	X	X		
Conversion of forests for tourism	X	X		
Fuel wood for domestic use	X	x		
Selective logging and forest thinning for commercial sale of timber	X	X	X	
Logging for construction of infrastructure (houses, etc.)	X	x	X	
Soil erosion that affects forests and mangroves (landslides, mudslides)				
Glyphosate fumigation that affects forests, led by the government				
Collection of wood for fences of different type of pilot projects.	X		X	

The Table 15 below presents the activities and agents of each of the drivers of deforestation. Although all drivers are listed below, some are more important than others in terms of emissions.

Table 15. Drivers and deforestation agents

Agents of Deforestation				
Driver		Local community	Indigenous communities	External Agents
1	Conversion of forest to subsistence and productive food crops (agricultural activities)	X		
2	Conversion of forest to settlements (including tourism)	X	X	X
3	Conversion of forests for cattle grazing	X		X
4	Fuelwood for domestic use	X		
5	Selective logging and forest thinning for commercial sale of timber	X		X
6	Logging for construction of infrastructure (houses, etc.)	X		X
7	Soil erosion that affects forests and mangroves (landslides, mudslides)	X	X	X
8	Glyphosate fumigation that affects forests, led by the government			X

3.4.2 Drivers of deforestation

Deforestation in the area dependent on economic activities that encourage exploitation of the forest resources and the agents that undertake them. Deforestation is defined as a change in land use to another cover type in the medium or long term. This is generally done to make way for new cropland, settlements, or pastures. Other processes where logging or clearing are undertaken on a less permanent basis are considered degradation. This distinction is important because all productive activities that require land use change are considered drivers of deforestation, while clearing activities to generate income periodically without affecting land use, are the drivers of degradation.

The main activities that generate degradation or deforestation are ranked by contribution of GHG emissions as follows:

1. Conversion of forest to croplands for subsistence or productive farming

2. Conversion of forests for cattle grazing
3. Conversion of forest to settlements (including tourism)
4. Logging for construction of infrastructure (houses, including tourism)
5. Fuelwood logging for domestic use
6. Selective logging and forest thinning for commercial sale of timber
7. Soil erosion that affects forests and mangroves (landslides, mudslides)
8. Glyphosate fumigation that affects forests, led by the government.
9. Collection of wood for fences of different type of pilot projects.

Rank	Driver	Contribution (%)
1	Conversion of forest to subsistence and productive food crops (agricultural activities)	25%
2	Conversion of forest to settlements	22%
3	Conversion of forests for cattle grazing	16%
4	Conversion of forests for tourism	12%
5	Fuelwood for domestic use	8%
6	Selective logging and forest thinning for commercial sale of timber	7%
7	Logging for construction of infrastructure (houses, etc.)	6%
8	Soil erosion that affects forests and mangroves (landslides, mudslides)	2%
9	Glyphosate fumigation that affects forests, led by the government	1%

10	Collection of wood for fences of different type of pilot projects.	1%
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Table 16. Activities that generate degradation or deforestation are ranked by contribution of GHG.

3.5 Additionality

The most likely baseline scenario for this project is the existing or historical changes in carbon stocks in the carbon pools within the project boundary. The project area would be deforested in the absence of the REDD project activity.

Under the defined baseline scenario, the project area would be deforested at existing or historical rates in absence of the project. This scenario would result in significant emissions of carbon dioxide compared to the expected decrease in emissions from project activities under the with-project scenario.

An assessment of anticipated community conditions in the without-project scenario has been completed via consideration of current and expected future trends in community condition, projected change in forest cover in the absence of the project, and the causal factors summarized in Table 17. As recommended by Richards and Panfil (2011), an analysis of factors which contribute to the ongoing focal issues identified by the communities forms a central component of the community baseline scenario analysis.

As depicted Table 17, poverty, insufficient infrastructure and programs (e.g. water, sanitation and health facilities), and decline in ecosystem services have been identified to be important focal issues for the project communities. The factors most directly responsible for these issues are lack of sustainable livelihood and economic alternatives, lack of infrastructure, health and education programs, and the unsustainable exploitation of natural resources to meet short-term economic and capital needs. In the absence of the project there are no plans, and no anticipation of future interventions that would be sufficient to address the various factors that contribute to these problems. Therefore, for example, a continued lack of training opportunities, technical extension, capital for value-added facilities, and expertise for value chain development will result in limited to no improvements to poverty conditions, livelihood alternatives and unsustainable forest exploitation to meet short-term needs, in the baseline.

Similarly, a lack of resources and capacity for integrated planning, infrastructure, and project management in the absence of the project will most likely result in limited or no future improvement to community health and education programs and infrastructure.

This trend also pertains to the expected decline in natural capital including important community ecosystem services. Ecosystem services, including water supply and erosion control, will decline as forest depletion continues unchecked. In addition, the significant role filled by local forests in supplying fundamental community needs such as timber and non-timber forest products for domestic uses (medicines, fuel wood, construction) and cultural identity will be further at risk.

Project Intervention Areas	Contributing Factors	Contributing Factors	Direct Factors	Community Focal Issues
Support for productive activities: training, extension, crop yield improvement, processing facilities, value chain development.	Insufficient training opportunities and technical extension, capital.	Limited technical capacity to develop alternatives Insufficient access to financing for value added facilities, crop improvements Limited connectivity with potential markets	Lack of sustainable livelihood and economic alternatives	Extreme poverty Insufficient community infrastructure and health & education programs
Integrated development planning, long-term investment in infrastructure and programs.	Limited access to alternative capital for infrastructure. Low capacity for integrated planning	Lack of funding transfers, government support Lack of integrated planning	Lack of funding for community infrastructure and health	Long-term loss of natural capital and associated ecosystem services
Management and administration training, environmental education, funding for salaried project personnel and implementation logistics.	Lack of capacity and resources for administration, project mgmt. and environmental awareness	Natural resources utilized without long-term planning, to help meet short-term economic and capital needs. Limited environmental awareness.	Unsustainable timber and fisheries exploitation	

Table 17. Problem flow analysis: community conditions in absence of the project

An assessment and description of how the without-project land-use scenario would affect biodiversity conditions in the project zone has been completed via consideration of current biodiversity trends in the Pacific Region, trends in change to natural forest cover, and through an analysis of causal factors (Richards and Panfil 2011). The scope of biodiversity conditions considered is defined and linked to the objectives and major activities of the project (i.e., the conservation of natural forest land cover and attributes). This is so that the later comparison of the without-project scenario to the project scenario is relevant to biodiversity variables.

Increasing threats to biodiversity in the Colombian Pacific and Choco-Darien Bioregions are well documented including the species at risk documented by IUCN. Biodiversity changes correlate to changes in vegetation cover (Richards and Panfil 2011.) and deforestation as well as forest degradation are key issues for the project area as documented through land-use change analysis and projected future land-use in the absence of the project. As described in Section 5.1.4, annual deforestation in the project area averaged 302.5 ha per year from 2002 to 2014. An analysis of trends finds that about areas dedicated to agriculture and 70 of pastures are added each year in average. Overall, these trends signify a continuing, if not increasing threat to biodiversity in the without-project scenario.

Direct biodiversity threats associated with forest loss, and their contributing factors are identified in Table 18 . Mangrove and mainland forest, key conservation targets for the project, are impacted by a number of direct threats from land-use conversion for crops, pastures and settlements, fuelwood and commercial and domestic timber extraction. Threatened species and forest dependent species in general, as well as important mangrove ecosystems are at risk of further decline without significant intervention. However, the factors identified as contributing to these declines are not being addressed in the absence of the project and there are no signs currently of them being addressed in any significant way in the future. For these reasons, it is projected that in the absence of the project, the amount and connectivity as well and the structure, function and available habitat provided by project area forests will continue to decline.

Table 18. Direct biodiversity threats associated with forest loss

Project Intervention Areas	Contributing Factors	Contributing Factors	Direct Threat	Conservation Target, Focal Issues	
Governance: strengthening of land tenure status and forest governance; development and implementation of sustainable forest and land use management plans; demarcating forest, tenure and ownership boundaries, and areas of forest protection; silvopastoral and assisted natural reforestation	Limited local resources, legal framework, governance and capacity for land-use planning	Community laws do not limit forest exploitation	Conversion to crop land	Mangrove and mainland forests (diminished forest area, fragmentation, degradation of forest composition, structure, function and habitat)	
		Lack of clarity & definition of individual / family land rights.			
		Ineffective land-use planning			Conversion to pastures
	Limited land-use implementation capacity	Limited awareness of boundary locations for land-use zones, titled property	Conversion to settlements		Biodiversity HCVs
			Conversion for tourism		
			Logging for construction of infrastructure		
			Fuelwood for domestic use		
Support for productive activities, alternative livelihood	Limited alternatives to land clearing (for crops, pastures or settlements) and timber extraction (fuelwood or commercial)	Unmet economic, sustenance needs for families. High demand and price for timber.	Selective logging and forest thinning for commercial use		
Capacity building and training		Limited local capacity for environmental			

		leadership project implementation		
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3.5.1 Additionality: Application of VCS Tool

The project used the VCS tool for the VCS AFOLU Project Activities Additionality Demonstration (VT0001) version 3.0, to evaluate the project's additionality and select the baseline scenario.

For this, the following steps were followed:

- Step 1. Identification of alternative land use scenarios with respect to the proposed project activity;
- Step 3. Barrier analysis.
- Step 4. Common practices analysis.

Step 1: Identification of alternative land use scenarios to the VSC AFOLU project activities

Alternative land use scenarios has identified concerning to proposed project activities, which could be defined as the baseline scenario.

Sub-Step 1a (a): Identify credible alternative scenarios for the proposed activities of the VCS AFOLU project.

The project area corresponds to the mangrove and forests under the jurisdiction of the Los Riscas Community Council (Municipality of Nuquí) which corresponds to approximately 27,870.04 ha.

The forest areas chosen for inclusion in the program area comply with the definition of forest for Colombia¹⁵, adopted by the Ministry of Environment and Sustainable Development - MADS and currently in force.

Realistic and credible land use scenarios was identified, which would have occurred in the project area in absence of REDD project activities with the VCS standard. These scenarios are completely feasible for the project area, taking into account relevant national or sectoral policies and circumstances; as well as the historical uses of the land, practices and economic trends of the settled communities that belong to the Los

¹⁵ Minimum crown coverage: 30%, minimum area of 1 ha, minimum height 3-5 m. <http://cdm.unfccc.int/DNA/index.html>.

Riscales community council, which have a direct or indirect interaction with the mangrove forests and mainland, whose socioeconomic and ecological conditions are similar to those that have occurred in the project area during the last 10 years.

Scenario 1: Continue with preconditions of Land Use

Considering that Law 70 of 1993, which recognizes the collective ownership of Afro communities and that in the collective territories these communities carry out traditional productive activities, the community councils are in charge of delimiting and assigning areas within the adjudicated lands, to different land uses that guarantee the subsistence of its inhabitants and in turn ensure the conservation and protection of collective property rights, the preservation of cultural identity, the use and conservation of natural resources, through a board local.

Considering the above and that the communities carry out productive activities for self-sufficiency and subsistence, the first scenario of land use is identified, within the realistic and credible alternative scenarios that can occur in the absence of the AFOLU project, the conditions and activities prior to the use of the land use would be maintained, without the implementation of the project. The conditions identified as pre-project, which promote patterns of unplanned deforestation in the area under the jurisdiction of the Los Riscales Community Council are: Subsistence agriculture, cattle ranching and selective logging.

In the forests under the jurisdiction of the Los Riscales Community Council, deforestation processes are more common than degradation processes. The pressures on the resources associated with the forest that correspond to local events.

These pressures may be derived from the main economic activities of the municipality, which were identified in the diagnostic 2005-2016 territorial planning scheme (see Annex 34), the 2007-2020 ethno-development plan (Annex 17). Among the main activities identified is agriculture and livestock, the impact on forests of these activities can be seen reflected in the increase in areas with agricultural activities between two periods prior to the start date of the project:

Table 19. Land Uses 2005-2009 and Land Uses Pre-project 2010-2012

LULC Class	2005-2009	2010-2012
Territorios Artificializados	19,65	19,65
Pastos	225,91	146,80
Mosaicos Agrícolas	1915,69	3282,78
Bosques	32835,74	30539,07
Herbazales	0,00	156,65
Vegetación Secundaria	580,45	1536,63
Zonas arenosas naturales	30,71	30,71
Zonas pantanosas	181,74	25,09
Sedimentos	6,23	5,82
Ríos	385,23	390,25
Lagunas	119,84	122,01

Source: Technical team, based on land maps from the Colombian Environmental Information System SIAC (Sistema de Información Ambiental de Colombia)¹⁶. Theme: Biodiversity

As seen in table 20, the forests suffered a considerable loss covering 90% of the area of the community council for the first period (2005-2009), going on to cover 84% for the period 2010-2012. This contrasts with the increase in agricultural mosaic areas, which increased from 5 to 9% of the community council area.

As mentioned before, agricultural activities are those that exert the greatest pressure on forest areas and their importance as a productive activity is described below:

- **Subsistence farming:**

According to the Ethno Development plan (Annex 17) and the Nuquí Territorial Planning Scheme, agricultural practices in the jurisdiction of the Los Riscales community council are traditional productive systems that include crop rotation and use of products according to the season. . According to the ethno-development plan, the sowing periods go from January to August where the following products are sown:

Table 20. Agricultural products grown by the communities of RiscalesSource: Plan de Etnodesarrollo 2007-2020 (Annex 17)

¹⁶ <http://www.siac.gov.co/catalogo-de-mapas>

Specie	Varieties
MAÍZ	<i>Blanco, Amarillo, Colorado, Carpio</i>
CHONTADURO	<i>Verde, Amarillo (Bactris gasipaes)</i>
CAIMITO	<i>Verde y amarillo</i>
CAÑA	<i>de Azúcar, Negra, Amarilla, Cañaguata Amarilla, Morada, Cañaguagua, Cañapalo, Negra lisa, Pajarita, Valluna, Rayada</i>
PLÁTANO	<i>Rozo, Pompo Dominicó, Blanco, Hartón, Mocho, Felipita, Candelo, Real, Rucio, Mocho, Cenizo, Cajeto,</i>
BANANO	<i>Banano, Sato, Sardinero, Chivo, Real, Morocato, Manzano, Rozo, Guineo, Pajarito</i>
YUCA	<i>Yuca, Sanca, Sanca de Pava, Yucatón, Granito, Tempranita</i>
PAPACHINA	<i>Real, Maruja, Rascadera, Mafafa, Blanca, Morada, Arracacha, San Antonio</i>
ÑAME	<i>Real, Morado, Injerto, Barqueño, Blanco, Papa</i>
BOROJÓ	<i>Real; Grande, Mediano y pequeño, redondo largo</i>
GUAMO	<i>Guaba larga, Real, Machete, Rosquita, Bija</i>
LIMÓN	<i>Casero, Mandarina, Francés, Lima</i>
COCO	<i>Real, Típico, Manila, Gigante, Enano, Brasileño, Cartagenero, Híbrido</i>

Agricultural activities are those that are mainly associated with deforestation, the widespread practice of shifting grave agriculture, which leads to the periodic establishment of new cultivation areas at the expense of native vegetation present in each area.

- Livestock

Livestock activity, although on a small scale, takes place in the corregimientos of Arusí, Partadó and Termales. This activity is practiced extensively and mainly for the production of meat.

According to the Diagnosis of the North Pacific Coastal Environmental Unit (UAC-PN), the level of knowledge and experience in livestock management is rather poor and traditionally it is combined on farms with agriculture, maintaining low densities due to economic limitations of community members, to buy cattle and allocate land for pasture. However, despite its low density, it is considered one of the greatest threats to forest loss and to the habitat of flora and fauna species in continental forests.

Table 21. Bovine production in the municipality of Nuquí

BOVINE						
0-12		13-24		Mas 24		Subtotales
M	H	M	H	M	H	
71	33	22	25	17	72	240

Source: Fuente: Diagnostico Integrado de la Unidad Ambiental Costera del Pacifico Norte Chocoano

According to Diagnóstico Integrado de la Unidad Ambiental Costera del Pacifico Norte Chocoano (Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andrés 2009) document, in the municipality of Nuquí, as in the municipalities of the North Pacific, animals are raised domestic mainly pigs and chickens. These represent family savings, complementary to the usual food or an income from the sale of derived products. These animals are raised domestically in the patios of houses and fed with household waste or agricultural by-products, allowing the use of organic waste, representing a serious risk to human health.

Table 22. Pig Production in Nuquí

Pig's				
0-6		> 6		Totals
M	H	M	H	
210	180	134	123	647

Source: Secretaría de Agricultura departamental. Diagnostico Integrado de la Unidad Ambiental Costera del Pacifico Norte Chocoano

- Consumption of wood for local use and commercialization

The deforestation of forests in the jurisdiction of the Los Riscales Community Council is closely linked to the use of forest resources. This situation occurs both in mangroves and in terra forests, although the purposes of use, the impacts on the forest and full

knowledge of the associated problems vary from one to the other. In the case of mangroves, deforestation is closely linked to the extraction of wood for firewood (cooking) and for local construction.

One of the most important productive activities within the communities of the Los Riscas community council corresponds to the use of forests as cooking fuel, construction of houses and commercialization of wood. Within the framework of Plan de Manejo de Manglares del Golfo de Tribugá (2014) (see annex 4), a characterization of this activity identified as "Leñateo" was carried out in four focus groups, made up of people dedicated to the extraction of firewood, in the communities of Coquí Nuquí Jurubirá and Tribugá. As a result, it is estimated that 72.2% of the homes in the communities of Jurubirá, Tribugá, Nuquí, Panguí and Coquí, in the Gulf of Tribugá, cook with mangrove firewood. The species most frequently used for this purpose are white mangrove (*Rhizophora harrisoni*) and red mangrove (*Rhizophora mangle*) and occasionally natural mangrove (*Mora oleifera*) is used.

On the other hand, in continental forests, in addition to the use of wood for firewood, there is a selective use of species for commercialization. According to the territorial planning scheme of the municipality of Nuquí, the species with the highest volume of mobilization are in Table 23.

Table 23. Species with the highest volume of wood mobilization

Specie	Vol (M3)		
	2003	2004	Total
Guino	1221	92	1313
Cedro	976	2150	3126
Granadillo	68	12	80
Sajo		41	41

Source: extracted from the EOT 2005-2015 Nuquí - Chocó, from Codechocó Statistics

It is mentioned in the ethno-development plan that the time that marks the beginning of forest work is determined by winter, and the fluctuations in the water level, which make it possible to drag and float the logs, from the forest to where the intermediary or the collection sites are located, where they are transported in the form of logs (trunks)

by tugboats or boats (sailboats) in the case of block wood. The wood is not fumigated to avoid damage to the soil and water. Most of the wood that is traded raw.

Scenario 2: The project activities within the established area are developed without the project being registered as VCS AFOLU

In this scenario, the project is developed by the communities without the support of income from carbon credits as a result of an agreement of wills between all the communities of the Los Riscasles community council. The loss of natural areas, the expansion of areas for agriculture and livestock, and the pressures and drivers of loss and transformation of biodiversity that favor unplanned deforestation in the area are stopped.

The area of the collective territory of the Los Riscasles community council where the project will be developed covers areas of mangrove forests and terra forests, which are managed by the community through the Los Riscasles General Community Council", as a legal entity that exercises, in coordination with the local Community Councils, the government, administration, control and planning of the 31,469.87 hectares of Land that involve the nine Communities settled in the Gulf of Tribugá, municipality of Nuquí, in accordance with national regulations.

According to Law 72 of 1993, in article 4 of chapter III of recognition of the right to collective property, it is mentioned that the communities must form a community council, as a means of internal administration and whose function is: "to delimit and assign areas within the adjudicated lands; ensure the conservation and protection of collective property rights, the preservation of cultural identity, the use and conservation of natural resources; choose the legal representative of the respective community as a legal person, and act as amicable mediators in internal conflicts that are feasible for conciliation"

In this scenario, it is assumed that the communities actually carry out organizational strengthening activities and implement local governance activities, in addition to community control and surveillance in the territory under their jurisdiction, accompanied by the environmental authority CODECHOCO, as established in article 4 of the Law 70 as one of its functions, which allows the implementation of strategies that facilitate the conservation of forest cover, hand in hand with new economic alternatives such as ecotourism and responsible fishing in a free market that does not include the extraction of wood. Consequently, the extension of the agricultural limit is stopped, and the colonization of forest areas is avoided. Additionally, the uses and customs of the communities are favored by the strategies implemented by the

members of the communities themselves, which in turn allow them to secure income and resources without the need to cut down more forests.

Within the management and planning activities of the collective territory of Los Riscasles, led by the Community Council, the community has formulated land management instruments such as the Ethno Development Plan, which is valid for 13 years (2007-2020). Within the framework of the ethno-development plan, management zones are defined for the management and planning of the territory, including the conservation of natural resources, through participatory exercises and historical review of the occupation of the territory by these communities. Within the landscape of the collective territory, the communities have carried out a historical process of zoning and conservation of the Territory, taking into account the availability of natural resources, to satisfy the needs of the members of the communities. For this reason, the community council has identified and formulated medium-scale territorial planning units, taking as criteria environmental, productive factors, relief, natural risks, among others, differentiating each unit by mountain, stubble, mangrove, and also for the Riscasles and clowns in the sea (the river and the mouth or sea in and sea out).

Considering the above, in the Ethno-development plan, in the "Territorio Apropiación Distribución y Uso" section, a zoning has been formulated in what the communities call "Unidades Vitales", which are defined for the use of resources, sustainably considering the conservation of forests and biodiversity.

Table 24. Land Use Units “Unidades Vitales” defined by the communities of the Los Riscasles Community Council

Zone	Name
AC 1	Monte Bravo o Bosque primario
AC 2	Monte Alzado o Bosques en regeneración
AC 3	Monte Biche o Bosques de barbecho
AC 4	Fincas
AC 5	Playas
AC 6	Mar

Source: Plan de Etnodesarrollo 2007-2020 (Annex 17)

In each one of the zones, the communities have defined permitted land uses to guarantee the sustainability of the resources by managing the territory without considering the project initiative. In the scenario where conservation activities similar to project activities are developed by the communities, in the absence of a project, the members of the community have historically carried out the conservation commitment, taking into account the provisions of Law 70 of 1993. supported by the authority

conferred on the community council to carry out oversight tasks in the territory, where members belonging to the community must request logging permits from the community council within the areas where it is allowed and this can only be used for construction housing or agricultural activities historically established in the territory, as established in the ethno-development plan (Annex 17) in the section "Spaces for community use" where the community council recognizes the duty of regulatory entity for land use by part of the community members. Another of the oversight tasks carried out by the communities is the surveillance of the forests in case of illegal extraction where the community council receives the complaints and takes corrective and possibly police actions (accompanied by the environmental authorities and the national police) for the conservation of the forests.

Based on the uses of the land and the categories of community planning, defined through a collective planning instrument in which the members of the community commit to a sustainable use of resources and to oversight and compliance with the agreements defined in the ethno-development plan, it would be expected that natural areas be preserved, the expansion of areas for agriculture and livestock be regulated and their growth stopped, and that the pressures and drivers of loss and transformation of biodiversity, due to the expansion of urban and tourist areas that favor unplanned deforestation in the area, are reduced. This regulation and sustainable use of resources is carried out through commitments and agreements on the part of each one of the members of the community and a Community Council with strong governance that supports corrective and surveillance actions within the community, in this way, is how this scenario is possible.

These processes manage to be maintained on a scale of decades through planned activities and adaptive management of contingencies inside and outside the communities, from the implementation and reformulation of avoided deforestation strategies and the management and use of financial and logistical resources so that said strategies are implemented. Keep. Finally, these strategies manage to restore the ecological and social function of mangrove forests and forests (Bosques de tierra firme) in the Los Riscas area, the rivers, the sea and their associated cultural values, through the effective recovery of areas affected by the impacts of change.

Scenario 3: Presence of activities similar to those proposed by the project in at least part of the VCS AFOLU project area, as a result of compliance with legal requirements or by extrapolation of similar activities observed in the geographical area and socio-economic and ecological conditions related to the proposals, which have occurred in a period not exceeding ten years prior to the project start date.

Part of the mangrove areas that are part of the collective territory of Los Riscales, are located within the limits of the DRMI Golfo de Tribugá Cabo Corrientes Regional Integrated Management District (Distrito de Manejo Integrado Golfo de Tribugá Cabo Corrientes) (2014), whose management is subject to the guidelines of the Mangrove Management plan of Golfo de Tribugá, which defines a zoning of mangrove areas with the following management categories: Sustainable Use, Recovery and Preservation. The three categories of use are compatible with the implementation of the REDD+ project.

The mangroves that overlap with the project area are part of the DRMI, which was declared by the Corporación Autónoma Regional del Chocó CODECHOCÓ, environmental authority of the department of Chocó, by Directive Council Agreement 011 of December 18, 2014. This figure includes: intrinsically, a series of management guidelines that condition and regulate the activities to be carried out in the mangrove area. The DRMI area is constituted as a conservation and sustainable use strategy, which was conceived with the participation of the communities, from the characterization and its delimitation. On the one hand, the conservation strategy focuses on guaranteeing the representativeness of the conservation objects so that the ecosystem services of the communities can be ensured. This protected area includes coastal ecosystems such as mangroves, estuaries, beaches, and rock reefs (2014).

On the other hand, the mainland forests are under the surveillance of the communities and the regional autonomous corporation of the CODECHOCÓ department. Within the framework of the Ethno-development plan of the Los Riscales Community Council, through participatory activities and spaces for reflection within the community (workshops, assemblies, among others), community members recognize the importance and ecological value of forest resources and its importance for the survival of the population. In these spaces for reflection, the communities state that: "the importance and ecological value of the forests for our permanence is reiterated, which led to a reconsideration of the mechanisms and strategies necessary to guarantee the sustainable use that has always been developed in our territories."

The Ethno Development together with the Plan de Manejo de Manglares are tools that allow guiding the proper use of forest resources and the control of anthropic activities within the collective territory: (i) the zoning of the DMI and the definition of the conditions and restrictions for the development and use of natural resources in accordance with the proposed territorial ordering; (ii) the definition of an action plan, with the strategic lines, programs, projects, management instruments and actions

required for its implementation, and (iii) a proposal for an investment plan with the respective mechanisms necessary for its financing.

The strategies of chapter 2.5, "Caminemos Juntos por la Sostenibilidad Ambiental de Nuquí", of the Municipal Development Plan 2016-2019¹⁷ for the municipality of Nuquí, formulate two strategic lines related to forest conservation:

- Protection Areas, the objective of which is to guarantee the sustainability of water, forest and marine resources, through efficient allocation and use, articulated with the planning and use of the territory and the protection of ecosystems.
- Adaptation to climate change: whose objective is to contribute to the sustainability of development by reducing the impact of climate change on the population and its environment.

On the other hand, there are policies and regulations to conserve forest areas and reduce GHG emissions, as part of the policies to reduce greenhouse gas emissions and the commitments assumed at the country level, the National Climate Change Policy is applied. (PNCC) and strategies to stop deforestation in the Colombian Pacific, making use of the Comprehensive Strategy for Control of Deforestation and Forest Management (Estrategia Integral de Control de la Deforestación y Manejo Forestal EICDGB) and the Colombian Strategy for Low Carbon Development (Estrategia Colombiana de Desarrollo Bajo en Carbono ECDBC) as key instruments.

The formal instances of articulation with the National Government such as the National Climate Change System (Sistema Nacional de Cambio Climático SISCLIMA), the Intersectional Commission for the Control of Deforestation and at the departmental level, the Chocó Forestry Board, are called upon to generate strategies in decision-making to Strengthen local governance in relation to the control of deforestation.

Regarding the mangrove areas, Resolution 1263 of 2018 formulates the measures to guarantee the sustainability and comprehensive management of mangrove ecosystems, which must be implemented by the Autonomous Regional and Sustainable Development Corporations, the environmental authorities of the Large Urban Centers

¹⁷ https://nuquichoco.micolombiadigital.gov.co/sites/nuquichoco/content/files/000062/3095_plan-de-desarrollo-20162019-municipio-de-nuqui.pdf

created by Law 768 of 2002 and the Environmental Public Establishments dealt with in Law 1617 of 2013, in order to guarantee the sustainability of said ecosystem.

Sub-step 1a (b): Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

All the listed scenarios could occur under current and historical conditions that influence the transformation dynamics of the local and regional (forest) cover.

Scenario 1 has been present historically, in the collective territory before the start of the project, as mentioned in the Ethno development Plan 2007-2020 (Annex 17), in chapter 2 on Ethnohistory Gulf of Tribugá, in the section on the traditional model settlement in the territory, in this section it is described how historically the communities are located along the beaches and establish subsistence agricultural activities and use of the forest for the construction of houses, fuel for cooking and commercialization of wood. These practices have been maintained over the years and in addition to the ethno-development plan, Socioeconomic¹⁸ and Timber Use¹⁹ Studies confirm that these land uses were present in the pre-project area and are likely to continue in the absence of the project.

Scenario 2, where project activities within the established area are developed without a project, similar conservation activities, carried out by the community through the community council, cannot be fully developed since the protection zones defined in the Ethno-development plan are not yet clearly defined and the capacity of the council is limited to carry out oversight tasks over the forests.

Scenario 3, this scenario occurs under current conditions, which influence the transformation dynamics of local and regional forest cover. Like scenarios 1 and 2, logging in the Los Riscales community council area is not allowed for commercial use. The difficulty in controlling and monitoring forests and the growth of economic activities that exert pressure on resources derive from the absence of sustainable economic alternatives adequate to the needs of the Community Council and the region, together with the weakening of community governance institutions.

On the other hand, the Regional Environmental Authority does not have the resources to adequately enforce logging regulations in the project area, as evidenced by the

¹⁸ <http://babel.banrepcultural.org/cdm/ref/collection/p17054coll18/id/399>

¹⁹ <https://www.minambiente.gov.co/wp-content/uploads/2021/10/Uso-y-Legalidad-de-la-Madera.pdf>

volume of wood extracted without approval annually in the project area (EOT 2005). On the other hand, the integrated management plan highlights the importance of creating joint participatory spaces for decision-making such as forest and mangrove tables, since these spaces allow reflection on the use of resources and also facilitate the resource management by the Colombian State Colombian State to guarantee territorial planning processes, and especially to share responsibility for the conservation of such important ecosystems. The mangrove management plan also points out the importance of the formulation and implementation of the "Mangrove management plan for the Gulf of Tribugá", which by itself does not guarantee its operation in the medium and long term, unless the Association of General Los Riscasles Community Councils and therefore the local community councils that comprise it, have resources to do so.

According to the information presented and considering the lack of resources and the institutional capacity of the entities in charge of environmental management in the project area, the same scenarios identified in Sub-Step 1a are maintained.

Sub-step 1c. Selection of the baseline scenario

Due to the lack of adequate governance and the lack of resources for the conversion of land for agriculture, together with processes of extraction of wood for consumption, construction and eventual commercialization within the project area, the most plausible reference scenario is the continuation of previous and current land use scenarios. These scenarios have been recurrent in the project area and the reference area in recent decades, as shown by studies, and are unlikely to cease without effective intervention. Therefore, it is expected that forest lands will become non-forest lands in the reference case, and as explained before, deforestation in Los Riscasles is of the unplanned type, for which the activity(ies) The most plausible VCS eligible(s) correspond(s) to the project category "Unplanned Avoided Deforestation and Degradation" (AUDD).

Steps 3 and 4 cover a stepwise approach that justifies the selection and determination of the most plausible baseline scenario.

Step 2: Investment Analysis

The VCS tool for evaluating Additionality allows you to follow step 2 or 3, or both if you like. In the case of this project, the Barrier Analysis (Step 3) was selected as explained below.

Step 3: Barrier Analysis

This section demonstrates how project activities would not be carried out without revenues from the sale of carbon credits.

Step 3a: Identify the barriers that would prevent the implementation of the proposed project activity

Investment barriers.

The communities of the Los Riscas community council do not have the conditions to invest in the implementation of the actions and activities defined in the Ethno Development Plan, related to the environmental component and hardly in projects that stop deforestation. Therefore, they depend on the third-party support for the implementation of activities. Historically, Los Riscas have developed activities similar to those of the AFOLU project with the help of donations from third-party organizations. The weakness of these supports is that they are short-term, and in most cases they focus solely on the development of capacities and on different scales than the entire area of the collective territory.

In the guide for the formulation of ethno-development plans²⁰, in the section "Basic strategy for the implementation and follow-up of Ethno Development Plans (Estrategia básica para la implementación y el seguimiento de los Planes de Etnodesarrollo)", initiatives are suggested that are associated with organizational strengthening, productive entrepreneurship, identity rescue culture and youth and gender empowerment in the community. However, initiatives related to avoiding deforestation are not explicitly included. Therefore, there is the possibility that in the formulation of the ethno-development plan it is not possible to include all the actions that are necessary in the territory for the conservation of forest and mangrove areas. Therefore, although the formulation of the ethno-development plan suggests having investment resources to carry out the actions determined by the territory, this does not necessarily guarantee the development of the activities necessary for the integral conservation of the entire area of the collective territory.

On the other hand, in the project area there is a management plan for the mangroves of the Gulf of Tribugá, which has a section on financial strategies that include alliances and cooperation agreements, projects derived from calls, national resources and regional transfers and royalties, as well as the consolidation of regional, national, or international conservation strategies for the mangrove ecosystem and wetlands, among others. This means that although resources can be managed, the plan does not have a permanent financial flow.

Regarding budget management for the Environmental Authority CODECHOCO, a series of strategic lines associated with the PGAR 2010-2021 are related. According to the

²⁰ https://www.mininterior.gov.co/wp-content/uploads/2022/03/cartilla-ped-2020-28dic-2020_1.pdf

Balance of the Action Plan of the Corporation 2016-2019, summarized in the action plan 2020-2023²¹. For the strategic line of ENVIRONMENTAL AND TERRITORIAL PLANNING, within the framework of the action plan "Ordinance and environmental planning of ecosystems and territory for the construction of peace" in the department of Chocó received a budget of 363,000,000 COP, of which 99% of the resources were executed for a period of 3 years and it is not related how this budget is distributed for the regional ones that operate directly in the territories and that part of these resources are destined for projects developed by the Riscales community. On the other hand, in the line of Comprehensive Environmental Management, within the framework of the action plan "Sustainable Use of Biodiversity for the Development of Choco in a Post-Conflict Scenario", one of the projects related to the reduction of emissions by actions in areas of Forest is: the "Functional Recovery of Areas Degraded by Anthropogenic Activities in the Department of Chocó", whose budget is 9,402,671,265 COP, which had an execution of 97%, however these recovered areas do not include forest areas in the area of the Los Riscales community council, as evidenced by the list of degraded areas to be restored in the PICC document (Plan Integral Climatico del Chocó)²². See Table 25

Table 25. List of degraded areas to be restored in Chocó.

²¹ <https://codechoco.gov.co/loader.php?IServicio=Tools2&ITipo=viewpdf&id=368>

²²

https://archivo.minambiente.gov.co/images/cambioclimatico/pdf/aproximacion__al_territorio/PICC_CHOC%C3%93_FINAL.-ilovepdf-compressed.pdf

Subregión Ecogeográfica	Factor	Zona
Central Norte	Minería	Condoto: cabecera municipal, corregimientos de Opogodó, La Muriña, la Florida, El aguacate, La Unión, Acosó, y Santa Ana.
		Tadó: Playa de Oro y Manungará (El Desértico)
		Cantón de San Pablo: Ríos Jorodó, Ánimas, Taridó y Managracito
		Istmina: cuencas de los ríos Suruco, Peradó y Profundo
		Sipí: ríos San Agustín y Taparal
		Medio San Juan: San Miguel
		Quibdó: Pacurita, río Cabí
		Río Quito: Paimadó
		Yuto
		Lloró: Villa Nueva, San Jorge, Tapera
Darién-Tacarcuna	Ganadería	Bagadó:
		Acandí: Tapón del Darién
Bajo Atrato	Ganadería	Riosucio: Tapón del Darién
		Carmen del Darién: Jiguamiandó y Curbaradó
	Cultivos de palma africana	Carmen del darién: Jiguamiandó y Curbaradó
		Tadó: Playa de Oro y Manungará (El Desértico)
		Cantón de San Pablo: Ríos Jorodó, Ánimas, Taridó y Managracito
		Istmina: cuencas de los ríos Suruco, Peradó y Profundo

Source: *Plan de Integral Climático del Chocó*

Although there are different investment mechanisms, they have a limited scope for the implementation of actions that prevent deforestation in the collective territory of Los Riscales. Therefore, the implementation of the REDD+ project would allow the communities to have the possibility of making investments aimed at conservation according to the context of their territory.

Los Riscales Communities do not have the necessary capacities to structure projects with a long-term return on investment, nor do they have their own financial resources for the implementation of projects related to avoiding deforestation. This panorama worsens, since the entities or organizations that have long-term investment mechanisms are few and have many requirements to access when considering the high associated risk of return on investment.

For example, to carry out the structuring, validation and first verification stage of this project, the necessary conditions were created so that Los Riscasles could carry out this first part. Specifically, ICCO Cooperación Colombia issued a loan from the parent company of ICCO Cooperación based in the Netherlands, being this guarantor of the payment of the loan and supporting Los Riscasles in having financial resources to achieve its REDD+ project. This credit will be covered by the REDD+ project once the carbon credits are sold.

On the other hand, another existing financing mechanism within the framework of the ethno-development plan, as an initiative of the Ministry of the Interior, is the Bank of projects for Black, Afro, Raizales and Palenqueras communities²³, through calls according to the established requirements, selection criteria, evaluation, and allocation of resources and monitoring of the use of public resources. However, within the lines of the Project Bank (Food Sovereignty and Autonomy Productive Projects Organizational Strengthening Digital Platforms - Technological Development Community Infrastructure) there is no one related to conservation of natural resources.

Finally, Local communities do not have access to bank loans or other financial mechanisms because of the lack of collateral.

Institutional barriers.

There are risks related to changes in government policy on the adoption of a legal framework, taking into account the developments of the National REDD+ Strategy and ongoing discussions. The first REDD+ initiatives are being promoted by the government to help overcome barriers. The main institutional barrier, however, is the lack of enforcement of logging bans due to the low capacity of jurisdictional institutions to enforce standards (e.g. Codechoco, and the national police).

In the Action Plan of the Corporación Autónoma del Chocó – CODECHOCÓ²⁴, the corporation mentions the degradation of forests and mangroves is due to the deficiency of knowledge in terms of valuation of the environmental goods and services of the region, the inappropriate technologies and practices used in forest exploitation, and institutional weaknesses to exercise environmental governance.

²³ <https://www.cci.org.co/wp-content/uploads/2020/11/Guia-Manual-Banco-NARP-word-13.10.20-vr26-nov-2020.pdf> and <https://app.sikuani.net/events/1BancodeproyectosNARP-UNAD2021/register>

²⁴ <https://codechoco.gov.co/loader.php?IServicio=Tools2&ITipo=viewpdf&id=368>

Deficiencies in terms of adequate knowledge of biodiversity and natural resources, particularly with respect to strategic ecosystems and special biological resources available to the region, limit the availability of more environmentally friendly technologies, production processes and products, as well as not allowing the adequate implementation of policies and preventive and corrective actions of the problems. In this scenario, there are deficiencies in the institutional databases, including limitations at the GIS level and there is a lack of a regional environmental information system, the information available is disjointed, lacks systematization, and does not have a high degree of reliability and updating. The available data are deficient in terms of their scientific-technical validation in practice and thus the experiences contribute little to the development of new knowledge. There is a low level of training and expertise among the human resources and the management of information within the entities is not very suitable. The dissemination and popularization of this lacks appropriate means of communication so that it is received, understood and used reasonably by the interested parties.

The foregoing can be seen reflected in the diagnostic exercises carried out in the communities of the North Pacific region of the jurisdiction of CODECHOCÓ, which covers the municipality of Nuquí where the Los Riscas community council is located, where the community manifests the following problem:

Table 26. Results of Mesa Regional de la Costa Pacífica, for the diagnosis of the Action Plan of the Autonomous Corporation CODECHOCÓ (Municipalities of Unguía, Juradó, Nuquí, Bahía Solano, Bajo Baudó, Medio Baudó and Alto Baudó)

TEMATICA: AUTORIDAD AMBIENTAL/CULTURA AMBIENTAL	
PROBLEMÁTICA	APORTES
Desarticulación de actores del SINA regional	Establecimiento de alianzas institucionales y comunitarias, y coordinación de la gestión en el marco de las competencias
Debilidad institucional	Articulación de los procesos y los instrumentos de planificación ambiental territorial y comunitaria
Baja participación de los grupos étnicos	Implementar acciones de manejo comunitario del bosque y los promotores ambientales
Poca conciencia ambiental	Implementar comunidades estrategias de comunicación Codechocó
	Establecer estrategias de control y participación social para manejo de los recursos naturales
	Fortalecimiento de grupos ecológicos y fomento de la educación ambiental en todos los niveles educativos y grupos comunitarios rurales y urbanos
	Implementación de estrategias de educación ambiental virtuales y medios de comunicación
	Formación y capacitación a los grupos étnico-territoriales en normatividad ambiental, planificación territorial, gobierno propio y gestión de proyectos ambientales
TEMATICA: AUTORIDAD AMBIENTAL/CULTURA AMBIENTAL	
PROBLEMÁTICA	APORTES
Ausencia o desactualización de instrumentos de planificación	Formulación, actualización y acompañamiento en la implementación de los planes de desarrollo, planes de vida, planes de ordenamiento ambiental y planes de manejo ambiental de los territorios colectivos
	Formulación de plan de uso y manejo de los recursos naturales desde la comunidad PUMA en conjunto con las instituciones competentes
	Apoyar en la formulación de un instrumento de planificación y ordenamiento pesquero
Poca implementación y desarticulación de los instrumentos de planificación	Articulación de CODECHOCO y los grupos étnicos para la formulación de los instrumentos de planificación étnico- territoriales
	Generar una mesa de trabajo de control y vigilancia de los recursos marino costero y continentales, entre las autoridades y la comunidad
Baja gestión de riesgo y cambio climático	Realizar la zonificación de los riesgos en el territorio, formular y/o actualizar los planes locales y municipales de contingencia ante riesgos de desastres
	Reforestación y recuperación de ecosistemas estratégicos, manglares y bosques
	Generar propuestas, proyectos o estrategias de adaptabilidad al cambio climático en comunidades costeras
Deficiente cultura y educación Ambiental	Fortalecer la educación ambiental en todos los niveles, promover los PROCEDAS y realizar capacitaciones a las comunidades
	Crear campañas permanentes para reducir el uso del plástico en zonas costeras, y promover el reciclaje

Source: Plan de Acción Institucional CODECHOCÓ 2020-2023

Step 3b: Demonstrate that the barriers identified would not prevent the implementation of at least one of the alternative land use scenarios (except the proposed project activity):

Within the alternative land use scenarios, agricultural activities are the only land use alternative that does not face any of the identified barriers, which is why it is the baseline scenario determined. Table 27 shows the list of barriers and how they favor or prevent the development of the scenarios described in step 1.

Table 27. Barriers and alternative land use scenarios

Barrier	Justification / Explanation
Investment barriers	The barriers to investment hinder scenarios 2 and 3 and favor scenario 1. There are significant barriers to the investment of economic resources in the area for the implementation of the conservation activities described in scenarios 2 and 3, while the Historical practices of land use are maintained, which favors unplanned deforestation for subsistence purposes and, on the contrary, prevents adequate self-government and the effective application of environmental policies. Investment barriers hinder scenarios 2 and 3 and favor scenario 1. Although some forest and mangrove conservation activities in the collective territory have been able to be implemented thanks to national and international cooperation funds and small donations, there is no flow of income that allows maintaining these initiatives in the long term. On the other hand, the community council must manage the implementation of the activities defined in the Ethno Development plan through state calls and this document does not show a financial plan or clear initiatives for an adequate management of resources for its implementation. These conditions favor the occupation and historical use of the land, since the development of agriculture and livestock are under the regulation of the community itself and since there are no financial alternatives for conservation, the community will continue to use the resources for its subsistence
Institutional barriers	Institutional barriers hinder scenarios 2 and 3 and favor scenario 1. Considering the complex institutional articulation between the Community Council with government institutions and the low technical and personnel capacity of both the community council and the region's Environmental Authority (CODECHOCO), these conditions favor the prevalence of ancestral practices of use and exploitation of natural resources and favor unplanned deforestation for subsistence purposes.

Step 4: Analysis of common practice

Due to the lack of governmental and community resources as shown by the social and economic studies of the territory and the financial and administrative limitations evidenced in the ethno-development plan (Annex 17) and the mangrove management plan for the Gulf of Tribugá (Annex 4), there are no similar development assistance projects or initiatives to reduce deforestation and forest degradation on this scale, in the region (see support that does not overlap with programs or projects in the territory), with the exception of the portfolio of REDD+ Pacific community projects

under the VCS and the CCB of which the USAID-funded projects known as BioREDD²⁵ and the Chocó-Darién²⁶ Corridor Conservation project are part. Although USAID has financed productive and employment activities in the region, there are currently no similar activities underway. The Ministry of Agriculture of Colombia and the previously called INCODER implemented programs to subsidize sustainable products, especially Fishing²⁷, but these programs are oriented towards sustainable fishing practices and do not contemplate the application of policies or incentives to reduce forest degradation or deforestation in the territory, since this activity does not directly impact the forest.

The region is made up mostly of land titled to the Community Councils and Indigenous Reserves, who do not have the financial capacity to implement activities similar to those proposed here. For this reason, efforts to reduce deforestation and forest degradation by supporting local governance, land titling, land use planning and implementation, value-added products, access to markets and local training are not common practices in the region.

By addressing the above elements, it is concluded that the project activities and the project as a whole are additional.

3.6 Methodology Deviations

According to the module VMD0007 BL-UP V3.3, section 4.2.1 which determines that, for the estimation of the Forest Carbon Stocks, each identified stratum must be represented by an estimated carbon stock 2 years before the start date of the project. Considering the above and considering that the project has a start date of April 1, 2014, the project initiative did not develop any of the procedures established in the VMD001-CP-AB V1.1 module for gathering primary information in field, within the project area. On the other hand, according to national regulations, that referring to Resolution 1447 of 2018, projects must make the accounting of their stocks compatible with the national reference bases. Therefore, for the Los Riscales REDD+ project proposal, information from national sources was used to estimate the carbon content in the forest strata (Forest and Mangrove) identified for the project.

It is important to mention that, according to the IPCC for the national inventory of GHG greenhouse gases (IPCC, 2006), "making use of information from national institutions is a good practice when projects fail to comply with the collection of primary

²⁵ <https://www.climatelinks.org/content/bioredd-portfolio>

²⁶ <https://fondoaccion.org/2020/10/16/redd-corredor-de-conservacion-choco-darien/>

²⁷ https://marviva.net/wp-content/uploads/2021/11/publicacion_gicpa_final_8-02-17.pdf

information". Likewise, this process is aligned with the processes of national balances, to which project initiatives must adhere in accordance with resolution 1447 of 2018. The data used come from information on plots established in the Colombian Pacific region, where the project is located and corresponds to the forest ecosystems that are present in the project area and to the same types of forest. Likewise, the authors of this technical document (Phillips et al. IDEAM 2014), argue that, compared to the use of different sets of allometric equations, the Alvarez models are the most appropriate to estimate the BA, not only because they generate conservative estimates with low associated uncertainty, but also because they were developed with trees harvested only in Colombia. The aboveground biomass data used (from Annex 2 of the referenced document, column "Inverse Variance") represent the most conservative values with the lowest standard error (231.7 Mg dm/ha with SEh 1.6 and 220.3 Mg dm/ha with SEh 1.9), when compared to other data from the same source.

The aboveground biomass values used by the Project (231.7 Mg dm/ha with SEh 1.6 and 220.3 Mg dm/ha with SEh 1.9) are lower than those reported in sources such as BioREDD, which found average values of 233.0 Mg/ha for terra firme forests and 229.9 Mg/ha for mangroves in the Pacific region of Colombia.

The values proposed in the current project in comparison with carbon data from similar projects in the same region and registered in VERRA, such as the REDD+ SUPP ID: 1391 project, present a carbon content of 164.83 tC/ha. In contrast, the value presented for the current project is 103.56 tC/ha. That is, the value applied is much lower than those reported in other REDD projects registered in VERRA, demonstrating the conservative position of the value.

Finally, it is important to mention that the national information has used information collected in the field, through the implementation of a network of sampling plots in the field (National network plot), the results of which were reported for 2014, the year the project began. Therefore, the project would meet the condition of data collection dates as described in module VMD007 BL-UP V3.3, section 4.2.1.

Regarding this deviation, the values and sources of information applied for the estimation of carbon content were:

Table 28. Values and sources of information applied for the estimation of carbon content.

Forest strata	Pool's	Value	Source value	Source	Observation
Mature Forest Tropical humid	Above Biomass	231.7 tha ⁻¹	National network of plots, which includes sampling areas in the Colombian Pacific. (See Figure 13)	Phillips et al. IDEAM 2014 ²⁸ .	The biomass estimation is based on the inverse of the variance described in the document.
Mangrove Forest	Above Biomass	220.3 tha ⁻¹	Plots, characterization of mangrove forests Gulf of Tribuga (see figure 14).	Vieira, et al 2014 , ²⁹ Yepes et al. 2015. ³⁰	The above tree biomass is estimate based on the minimum basal area value reported for the Gulf of Tribuga in 2014, and the biomass equation is applied based on the basal area proposed by Yepes 2015 .

²⁸https://espo.nasa.gov/firesense/content/Forest_degradation_and_biomass_loss_along_the_Choc%C3%B3_region_of_Colombia

²⁹ "Aportes técnicos del Sistema de Monitoreo de Bosques y Carbono a la propuesta de preparación de Colombia para REDD+: datos de actividad y factores de emisión. Instituto de Hidrología, Meteorología, y Estudios Ambientales (IDEAM).

²⁹ "Plan de manejo de los manglares del Golfo de Tribugá". MADS, MARVIVA, Parques Nacionales Naturales.

³⁰ "Ecuaciones alométricas de biomasa aérea para la estimación de los contenidos de carbono en manglares del Caribe Colombiano".

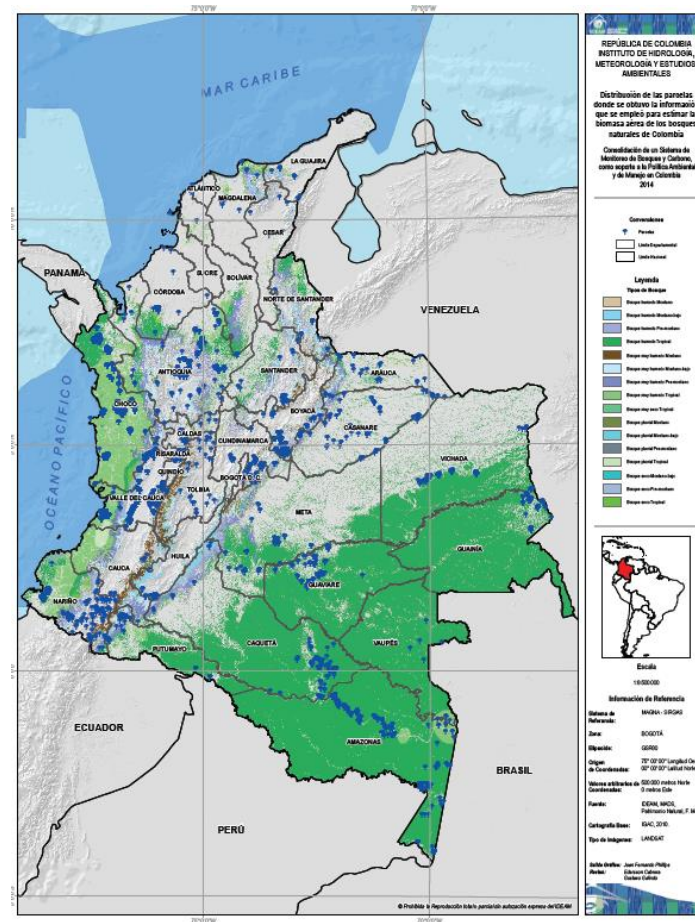


Figure 13. Network of national plot., biomass. Taken from Phillips et al. IDEAM 2014.

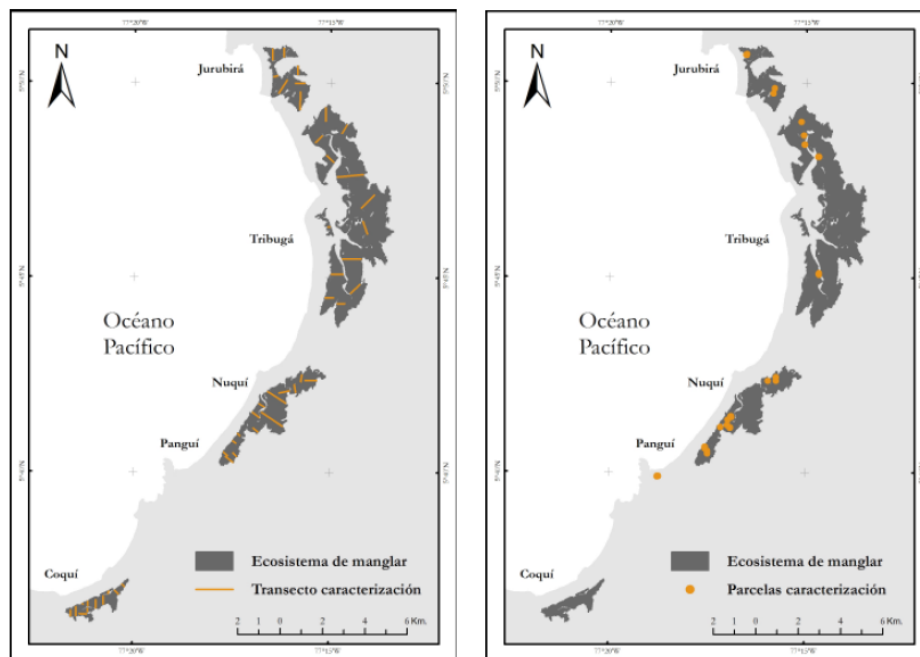


Figure 14. Mangrove sampling plots in the project area. Taken from Vieira et al 2014.

The below ground biomass values for these strata were estimated following CP-AB, V1.1, by applying Root to Shoot Ratio values.

These values were applied for both baseline (ex-ante) and project implementation (ex post).

Leakage Belt Consideration According to the BL-UP module, section 1.1.3 mentions a series of criteria that must be met by the areas considered as leak belts. Among the group of criteria, there are the so-called landscape factors, where the project proponent must demonstrate that the forest types must be present in the vanishing belt in a proportion of +/- 20 as in the project area. The leakage belt delimited for the Los Riscas REDD+ project is located next to the project area and does not include mangrove areas. The mangroves closest to the project area are included within the reference region, to guarantee conditions of similarity between the reference region and the project area, resulting in no mangrove areas being available for the construction of the leakage belt. In addition to the above, the escape areas do not include mangrove areas due to the distance that the agents of deforestation would have to travel to the location of the closest mangroves (see Error! Reference source not found.). Considering access to forest and mangrove areas, the leak belt is made up only of terra firma forests.

For gathering primary information in field:

When the project began the validation process in 2018, it did not meet the minimum time requirement for collecting information for each stratum, 2 years before the start date, for the establishment of plots for the quantification of the contents of carbon. The methodological deviation refers to the use of information from national sources for the estimation of carbon accounting in forests, which is derived from information generated in 2014, as related below:

Forest (Bosque de tierra firme): Phillips, J.F., Duque, A.J., Scott, C., Peña, M.A., Franco, C.A., Galindo, G., Cabrera, E., Álvarez, E. & Cárdenas, D. 2014. Aportes técnicos del Sistema de Monitoreo de Bosques y Carbono a la propuesta de preparación de Colombia para REDD+: datos de actividad y factores de emisión. Instituto de Hidrología, Meteorología, y Estudios Ambientales (IDEAM). Bogotá D.C., Colombia. 70 pp.

Mangroves (Manglares): Vieira et al. 2014. Plan de manejo de los manglares del Golfo de Tribugá. Nuquí

This modification is considered in accordance with the requirements of the standard, to use national information derived from national inventories, this process is aligned with the processes of national balances, to which project initiatives must adhere in accordance with resolution 1447 of 2018. Finally, it is important to mention that the national information has used information collected in the field, through the implementation of a network of sampling plots in the field (National network plot), the results of which were reported for 2014, the year the project began, which are considered conservative.



Figure 15. Mangrove location near of project area

4 IMPLEMENTATION STATUS

4.1 Implementation Status of the Project Activity

Table 29. Summary of the REDD activities carried out within the framework of the Los Riscasles project period 2014-2020.

Component	Parameter	Description	Results
Governance strengthening	Strengthening the status of land tenure and forest governance	It includes activities or actions that strengthen governance in the territory, which allow to arrange participation spaces, strengthen management and management plans, train and equip territorial teams for monitoring and the construction of information that allows recognizing the territory (demarcation of areas, georeferencing, participatory zoning maps, among others)	1 Mangrove Management Plan Tribugá
Support the Development and Implementation of Sustainable Forest Management	Land Use Management Plans		in the process of implementation
Delimitation Forest, Tenure and Ownership Boundaries, and Areas of Forest Protection			in the process of implementation
Energy alternatives for cooking food			64 eco-efficient kitchens were delivered and installed within the framework of the agreement with the MARVIVA foundation.
Productive Activities	Support for the development of economic alternatives and sustainable alternative livelihoods	These are activities that promote the strengthening of productive activities and the livelihoods of the community, including activities such as: training, action plans, farm improvement plans, deliveries of supplies or materials, technical assistance on the farm, georeferencing of	1 Harvest protocol for non-timber wild flora 1 Vanilla Business Plan improved ecotourism services: alternative tourist circuit "La Cumbancha"

		crops or orchards and strengthening of value chains	
Capacity building	Improve administrative capacity and local leadership	Capacity building is aimed at improving and acquiring skills and abilities by the community to carry out the management and administration of the activities supported by the REDD+ project. Capacity building includes activities such as: appropriation of the territory through workshops and training courses, spaces for dialogue related to gender and environmental issues, management of the territory through demarcation elements such as information billboards and GIS training, workshops for development of leadership activities, environmental education and socialization of REDD+ activities, promotion of cultural events, elements generated for the project (banners, booklets, games, newsletters)	1 Training workshop on forest use and its relationship with REDD+ projects (SENA) Comomopoca and Riscales strengthening capacities for negotiation- Update on new regulations. 1 workshop 10 training modules on negotiation in aspects related to forests and climate
Providing Alternative Livelihoods to the Agents of Deforestation	provide alternative livelihoods to deforestation agents belonging to the community		in the process of implementation

5 ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The quantification of baseline emissions followed the VM0007 methodology modules BL-UP (part 1-4 estimation of carbon stock changes and GHG emissions), X-STR, C-AB, E-BB. Following the module BL-UP the baseline deforestation rate was calculated from the Reference Region for Deforestation (RRD). Projected areas of deforestation are based on the simple historic approach, the population driver approach was not used. The following section is a summary of the analysis and equations. The complete

baseline report following BL-UP is found in the appendix folder “Climate monitoring data, Annex 19- Carbon Stocks Estimate”.

The methodology used to account GHG baseline emissions is composed by 4 steps

1. Definition of spatial boundaries
2. Definition of temporal boundaries
3. Estimation of annual unplanned deforestation areas
4. Estimation of changes in carbon pools and GHG emissions

5.1.1 Definition of spatial boundaries

Considering that the areas from which information on the historical deforestation rate is extracted and projected into the future must be delimited by spatial and temporal limits, the reference region was delimited to project deforestation (RRD) and of the project area (AP) taking into account the requirements of the VM0007 methodology, as follows³¹:

Reference region for projecting location of deforestation (RRL)

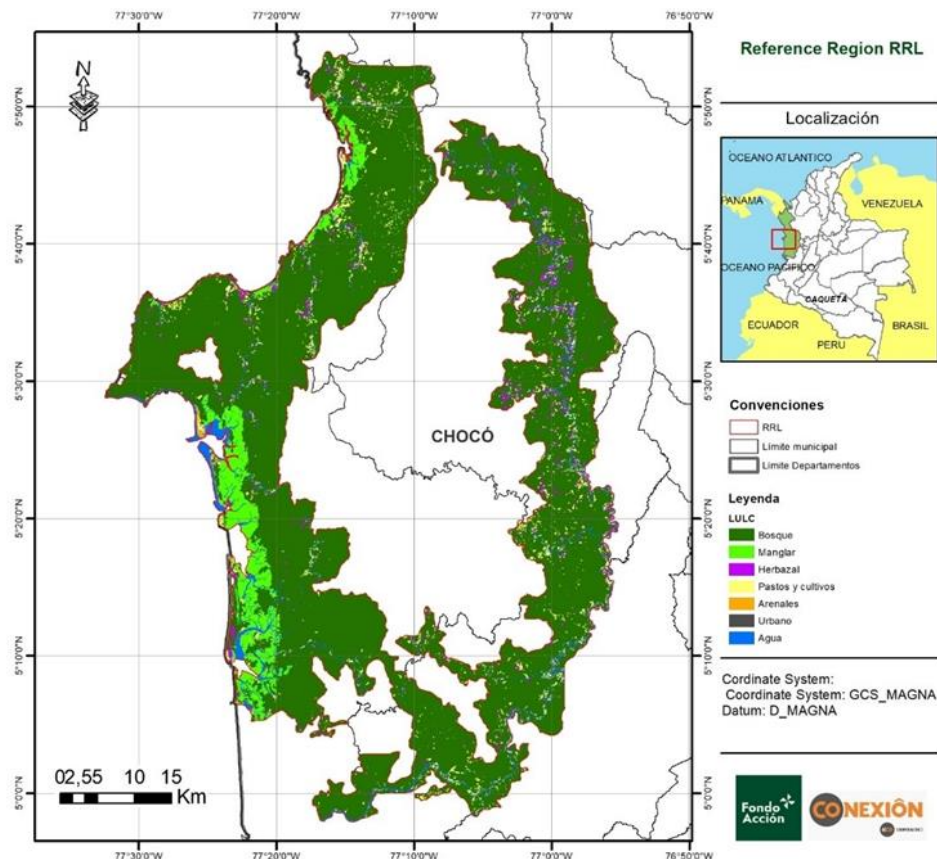
According to the first part of the VMD0007- DEFINITION BOUNDARIES module, section 1.1 Definition of the spatial boundaries of the analytical domain, there are two types of reference region with relevance to unplanned deforestation projects:

- Reference region for projecting rate of deforestation (RRD)
- Reference region for projecting location of deforestation (RRL)

According module BL-UP, including the project area and the leakage belt. The RRL for the Los Riscles REDD+ Project comprises the forest and mangrove areas that make up the RRD and includes the project area AP and the leakage area LK. The RRL is composed of 84.7% (208,146.649 ha) of forests at the start of the historical reference period (The RRL must be composed of a minimum of 50% forest at the start of the historical reference period) and 5.6% of mangroves (13,666.7 ha). The non-forest areas correspond to pasture and crop areas with 3.9% (9,613.56 ha), followed by grassland areas with 1.99% (4,901.42 ha), water bodies with 3.53% (8,678.41 ha), sandbanks with 0.35% (789.37 ha) and urban areas with 0.03%, for a total of non-forest areas of 9.78% (RRL must consist of a minimum of 5% non-forest). The RRL covers an area of 245859,013 ha and is located in coordinates 5°0'38,758" N and 77°4'11.062" W (see

³¹ All geographic files are located in Annex 18 – Geospatial Data

Figure 16). It is important to mention that, if the Baseline rate approach is simple historical, it is not mandatory to define the RRL.



According to step 3 of the BL-UP module, the initial configuration of the landscape, determine if the analysis of the location of deforestation is necessary. The landscape configuration for the Los Riscas project is a Transition configuration. Transition deforestation is different from mosaic deforestation, which is defined in the BL-UP module as any landscape in which no patch of forest in the project area exceeds 1000 ha and the forest patches are surrounded by anthropogenically cleared land, on the other hand, frontier configurations are described as any landscape in which none of the forest in the project area has current direct physical connection with areas anthropogenically deforested.

Determination of whether location analysis is required

Whether or not a location analysis is required is determined by the initial configuration of the landscape: Mosaic, transition or frontier configuration. All location analysis and quantification of the unplanned deforestation threat in this part of the deforestation threat in this part of the module is performed using the project boundary for the deforestation location previously defined (Annex 75. Landscape configured).

The first step necessary to perform the analysis is determine if location analysis is required. For this reason, it is necessary to determine the initial configuration of the project boundary landscape. Considering that historical deforestation in the project boundary has a transition configuration, to assess the transition configuration, the following steps were followed:

- a) Deforestation patches were identified for the dates analyzed in the historical reference period, 2002, 2007 and 2014, from the forest/non-forest layers for these years.
- b) A 50 m buffer was generated around the deforestation patches, identified in the previous step, and the total area was calculated for all dates.
- c) The total area results of the 50 m buffers were compared with respect to the project boundary (project area perimeter).

The project area perimeter is 1,114,002.02 meters, which was overlapped by a 50-meter buffer around the historical deforestation patches. In total, 79% of the project boundary is located near the areas of influence of the deforestation patches (879,052.08 meters of the project perimeter).

Therefore, being greater than 25%, the configuration of a transitional landscape is demonstrated

Thus, the location analysis was not considered, and the conservative approach proposed by the BL-UP module was selected.

As described in step: 3.4 Mapping of the locations of future deforestation, when the location analysis of future deforestation is not performed (3.4.1 section), the following conservative approach is applied:

Future deforestation is assumed to occur first in strata with the lowest carbon stocks (in all relevant carbon pools), according to the following conditions:

Select the stratum with the lowest carbon stock.

For the Los Riscas project area, the stratum with the lowest carbon stock is that of the mangrove forests, therefore, according to the aforementioned conditions, deforestation will occur in the stratum with the lowest carbon reserves, where

$A_{BSL, PA_{unplanned,t}}$ in the AP project area is 318.72 ha (annual loss of forest cover of mangroves and forests, in the AP project area). Taking into account that the mangroves in the PA project area correspond to 2014.63 ha, with an annual loss of 318.72 ha, the mangroves would be depleted within a period of 5 years from the start date of the project.

According to the conservative approach, as soon as the first stratum is depleted, the stratum with the next carbon stock will follow, which corresponds to forests. If the annual loss $|A_{BSL, PA, unplanned, t}|$ in the project area (378.72 ha) is maintained and considering that the forest areas of the AP are 25855.41 ha, during the project accreditation period (30 years), 7728.96 hectares will have been lost, corresponding to 29.89%.

For the leakage belt there are no mangrove areas, so only the loss of the forest layer is established. If the annual loss of forests in the leakage belt is 294.4 ha, it is expected that in 30 years 9126.4 ha of forests will be lost, which corresponds to 35% of the leakage area, without the implementation of the project. If the annual deforestation rate continues, the forest cover in the flight belt would be completely lost in 87 years, counted from the start date of the project. For more details see Annex 36.

Reference region for projecting rate of deforestation (RRD)

The reference region was built according to section 1.1.1 from the Module BL-UP version 3.3 of the methodology VM007.

The reference region was built according to section 1.1.1 of the BL-UP Module version 3.3 of the VM007 methodology. The selected RRD reference region corresponds to the forest and mangrove areas delimited at the beginning of the historical reference period (2002), located within the jurisdiction of the Afro-Colombian communities present in the area (see figure 15), excepting those areas defined as project area (PA) or leakage belt. By using the limits of the Afro community councils as the main element for the delimitation of the reference region, similarity is guaranteed in terms of governance systems, regulations, social structure and customs, which are present both in the project and in the communities. The community councils where the reference region is located are: CUEVITAS, VIRUDÓ, PAVASA, SAN AGUSTÍN DE TERRÓN, BELLAVISTA DUBAZA, PUERTO ECHEVERRY, PIZARRO, VILLA CONTO, SAN FRANCISCO CUGUCHO, RÍO PILIZÁ, and RÍO BAUDÓ ACABA, VILLA MARÍA DE PURRICHA.

The RRD reference region was also delimited considering similarity criteria using data such as slope, elevation, types of forest cover, precipitation and temperature (Table 22). These factors were evaluated so that the reference region and the project area were comparable with respect to land cover, climate and geography.

To ensure that there were no areas with restricted access to agents of deforestation in the reference region, all protected areas such as national parks, military bases, and areas under conservation were excluded from the reference area. Similarly, no areas of planned deforestation, forest management including forest concessions or plantations in the reference area during the historical reference period were included. In addition, a

road that is planned to eventually join the Pan-American Highway with Nuquí has been projected and excluded from the project area.

The RRD covers an area of 162,313.67 ha and is located at coordinates 77° 19' 51.747" W and 5° 18' 29.070" N.

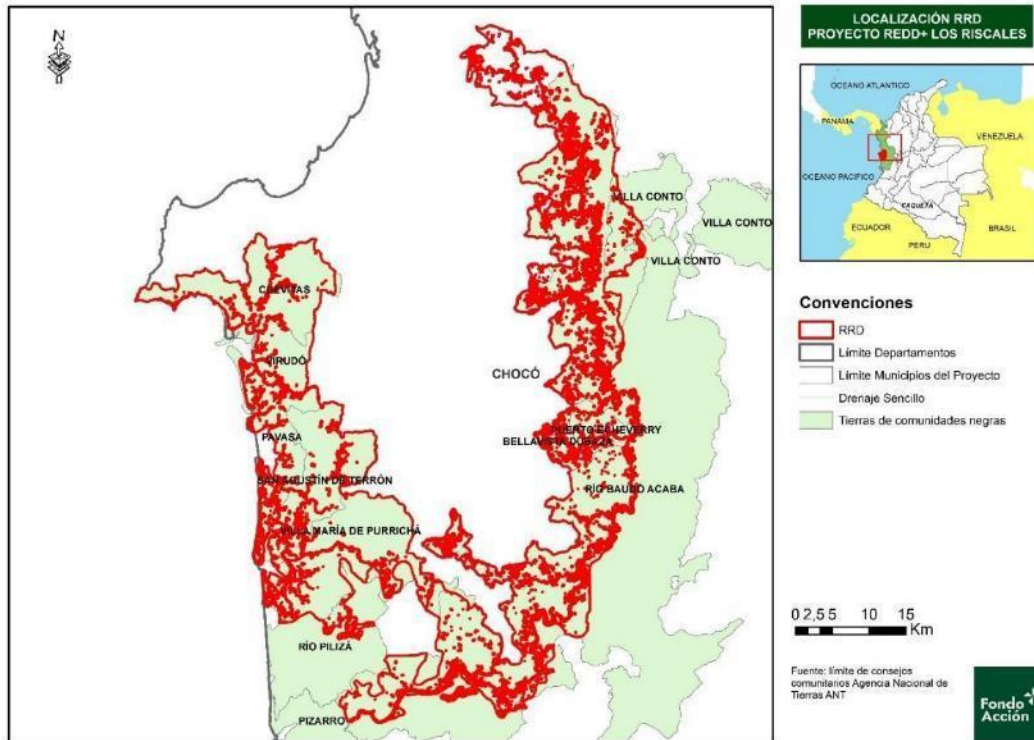


Figure 16. RRD within community councils

As required by the UP-BL tool, the area for the Reference Region for Projecting Rate of Deforestation (RRD) shall be calculated using the following expression below:

$$MREF = RAF * PA$$

$$RAF = 7500 * PA - 0.7$$

Where:

- MREF: is the minimum size of RRD
- PA: is the unplanned deforestation project area (ha)
- RAF: is the Reference Area Factor

A map of the reference area is provided as Figure 17

Table 30. Parameters to define RRD

Reference Region	Ha
Project Area	27,870.04
RAF	5.80
MREF	161,659.99
RRD	162,313.67

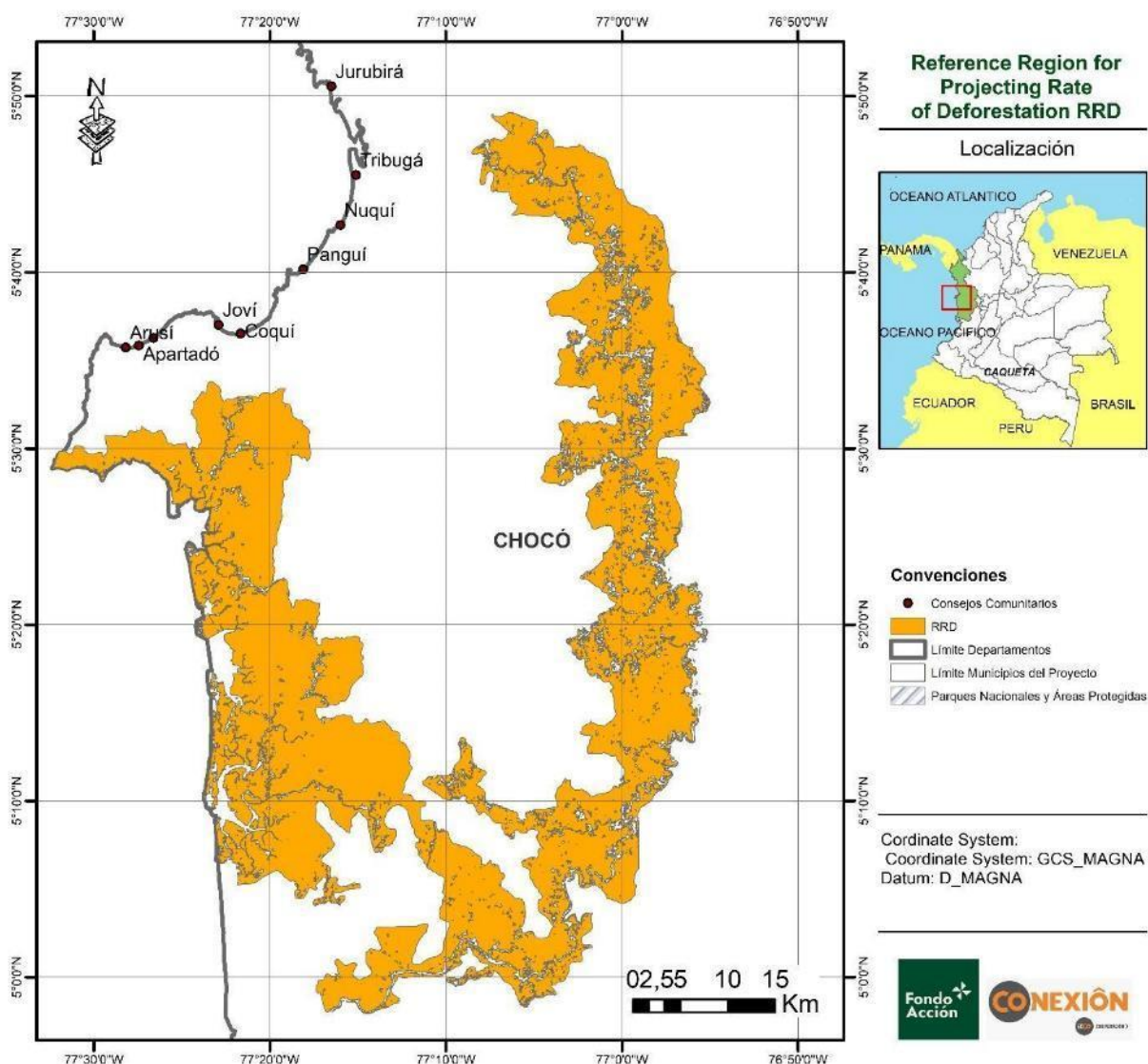


Figure 17. Reference Region for Projecting Rate of Deforestation

Project Area (PA)

According to the BL-UP module, the project area corresponds to the discrete parcel or parcels of land, entirely covered by forest at the start date of the project activity (year 2014), that are under threat of deforestation and in which the proponents of the project

will undertake the activities to reduce unplanned deforestation and the consolidation of the REDD activity.

For the Los Riscas REDD project, the project area corresponds to the areas of terra firm forests and mangroves that are under the jurisdiction of the Los Riscas community council, whose title was granted by Resolution 2206 of December 4 in 2002 (See Annex 13 Land Tenure and applicable laws). It is important to clarify that the titled area of the community council corresponds to 31,469.87 ha. and the area of the polygon obtained from National Land Agency –ANT data portal³² is 36,845.21 ha. Therefore, the project area was adjusted according to the proportion of the area titled to the community council, with respect to the area corresponding to the polygon in shp format.

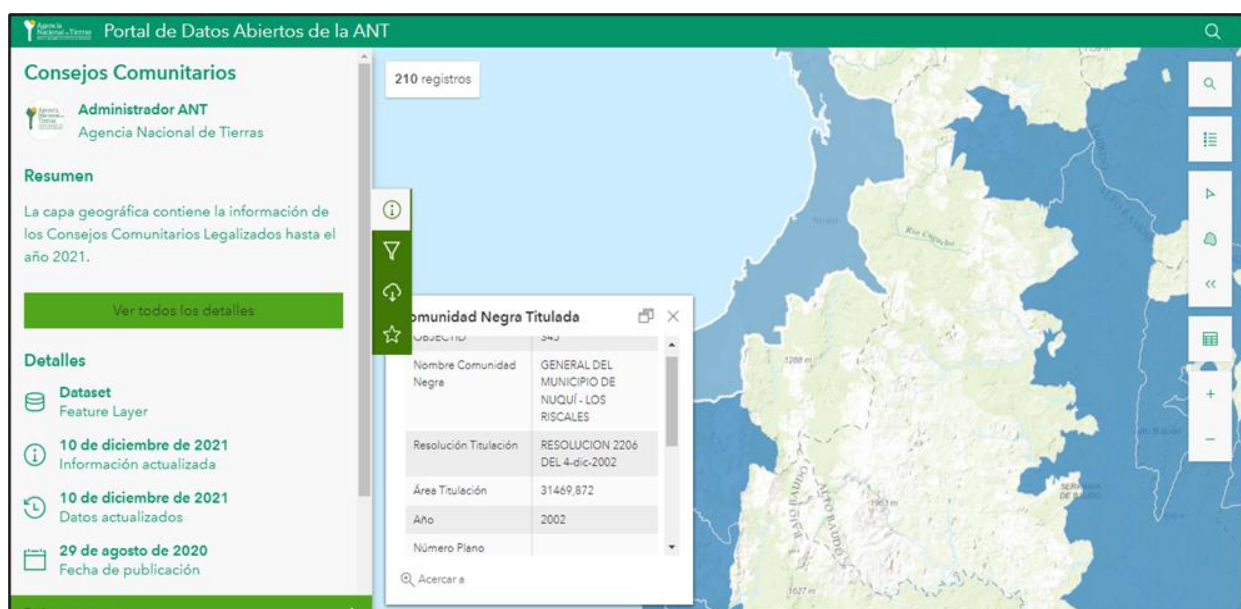


Figure 18. Screenshot from ANT, with spatial information from community council of Los Riscas

The AP covers an area of 27,870.04 ha and is located in 77°17'24"W 5°38'37"N

³² <https://data-agenciatierras.opendata.arcgis.com/datasets/agenciatierras::consejos-comunitarios/explore>

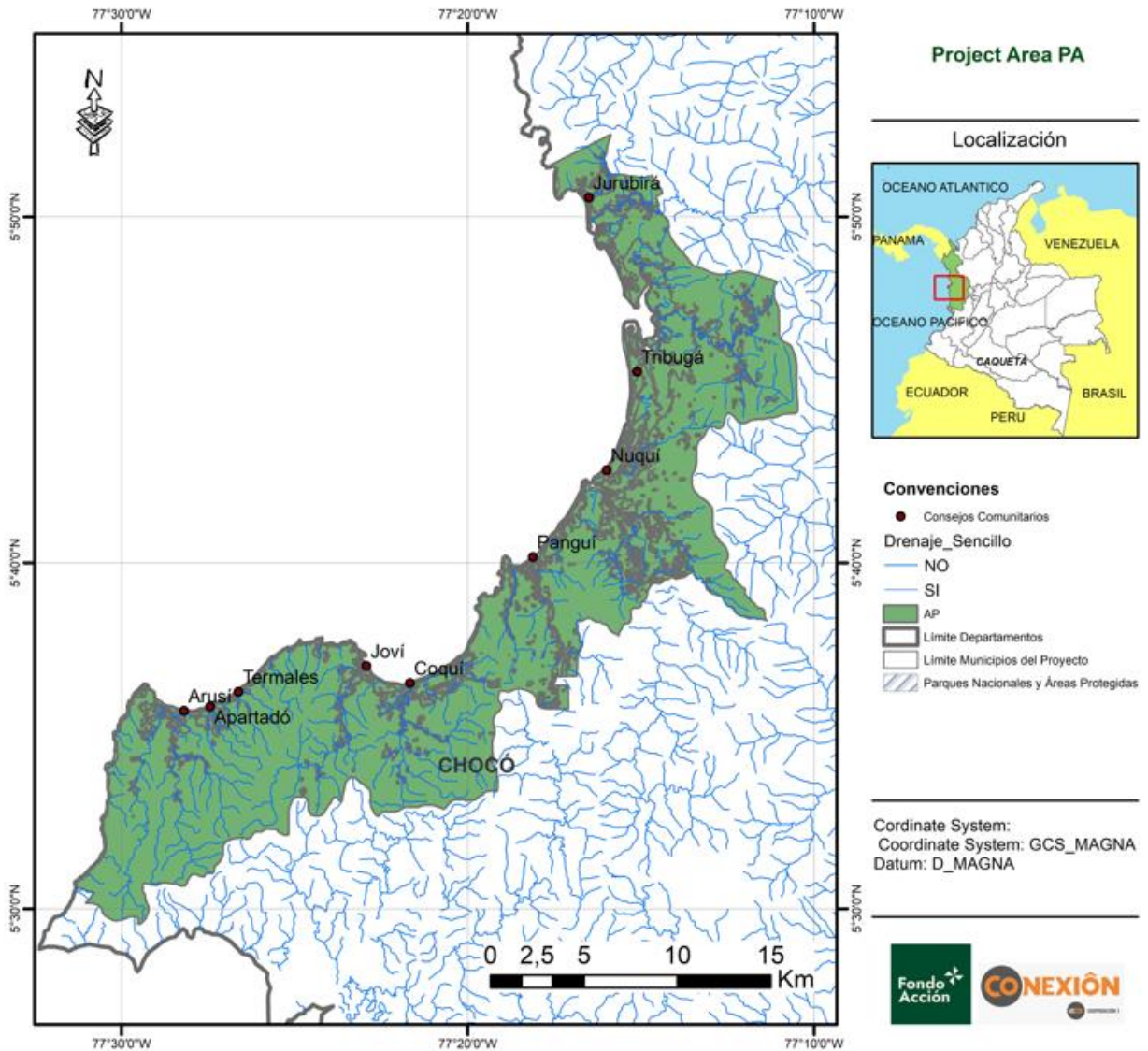


Figure 19. Project Area

Leakage Belt (LK)

See 5.3 Section

5.1.2 Similarity between Reference Region and Project Area

The analysis of the key similarity variables is described in the following table (table 32) and some details can be found in annex 38.

Table 31. Reference region and project area comparison

Category	Variable	Comparison																				
Agents of deforestation	Agricultural Areas	The agricultural areas of the RRD correspond to 10.5% of the total area, while the agricultural areas of the Los Riscales Community Council are approximately 9.0%. The above shows that the agricultural areas of both areas have a similar proportion and comply with the proportion of ±20%. These values were calculated from the LULC 2010-2012 layer for Colombia, obtained from the Environmental Information System for Colombia SIAC. ³³																				
	Lack of legal rights to use land is the same on both project and reference area	The RRD was built from the limits of the community councils neighboring Los Riscales (see figure 15), and all of them have a collective title granted within the framework of Law 70 of 1993 ³⁴ . The lands of the community councils of the communities of the Los Riscales Community Council and of the neighboring communities have the same legal tenure status, where the community lands are titled and are considered collective, but traditional ownership or family tenures are informal, and are based on the recognition of the members of the community. The following table summarizes the resolutions and the dates on which community titles were granted to the communities surrounding Los Riscales:																				
		<table><tr><th>Name Community</th><th>Resol.</th><th>Date</th></tr><tr><td>CUEVITAS</td><td>2701</td><td>21/12/2001</td></tr><tr><td>GENERAL DEL MUNICIPIO DE NUQUÍ - LOS RISCALES</td><td>2206</td><td>4/12/2002</td></tr><tr><td>VIRUDÓ</td><td>2698</td><td>21/12/2001</td></tr><tr><td>PAVASA</td><td>2695</td><td>21/12/2001</td></tr><tr><td>SAN AGUSTÍN DE TERRÓN</td><td>3369</td><td>21/12/2000</td></tr></table>			Name Community	Resol.	Date	CUEVITAS	2701	21/12/2001	GENERAL DEL MUNICIPIO DE NUQUÍ - LOS RISCALES	2206	4/12/2002	VIRUDÓ	2698	21/12/2001	PAVASA	2695	21/12/2001	SAN AGUSTÍN DE TERRÓN	3369	21/12/2000
		Name Community	Resol.	Date																		
		CUEVITAS	2701	21/12/2001																		
		GENERAL DEL MUNICIPIO DE NUQUÍ - LOS RISCALES	2206	4/12/2002																		
		VIRUDÓ	2698	21/12/2001																		
	PAVASA	2695	21/12/2001																			
SAN AGUSTÍN DE TERRÓN	3369	21/12/2000																				

			BELLAVISTA DUBAZA	1219	1/06/2000
			VILLA CONTO	160	9/02/1988
			RÍO PILIZÁ	3367	21/12/2000
			RÍO BAUDÓ ACABA	1152	23/05/2001
			VILLA MARÍA DE PURRICHÁ	1129	23/05/2000
	Agents' resident in the local area vs immigrants	Considering that the area of the Community Council is a Collective territory, granted by the Colombian state that recognizes the historical occupation of the territory, considering its traditional practices and the right to collective property. Being a collective territory of historical occupation, whose ownership is inalienable, imprescriptible and unseizable; It means that collective title lands cannot be sold or awarded to people outside the community. This condition affects the presence of migrants in the Community Council area, since it restricts the right to acquire land and therefore the presence of people from outside the community. Taking into account that the RRD was built mainly within the limits of community councils of Afro communities, the assessment to determine that the proportion of agent's resident in the area vs immigrants is the same +/- 20% in both project and reference area. Presence of immigrants in Community Council territories is minimal, as all of this ethnic territorial land restrict property and access of foreigners. (See Annex 38)			
	Landscape configuration	Forest classes	Two sources of information were consulted to establish the types of forests, the coverage map and land use 2010-2012 ³⁵ and Holdridge's life zones		

³⁵ <http://www.siac.gov.co/catalogo-de-mapas>. Categoría: Biodiversidad

		The forests identified in the land cover and use map, both for the project area and for the DRR were: Dense forests, open forests, fragmented forests and gallery forests; these categories belong to the legend of land cover and land use for Colombia Corine Land Cover. The proportion of Forest areas for the PA is 84.1% and for the DRR is 74.95%, which indicates that the proportion by type of forest in each of the areas is similar. On the other hand, the types of forests were identified from the Holdridge life zones³⁶, where it was identified that the predominant type of forest is the Very Humid Tropical Forest for both the project area and the DRR. Due to the above, the forest classes present in both reference and project area must have the same proportion (+/-20%)
	Elevation	Heights were extracted from the digital terrain model for Colombia: Modelo Digital de Elevación SRTM 30 Metros. Colombia. Año 2011³⁷, According to the description this model was built by the Shuttle Radar Topography Mission (SRTM). This elevation information indicates that the reference area and the project area are both between 0 - 250 m of elevation (+/-20%). (See Annex 38)
	Slope	The slope map was calculated from the DEM (Modelo Digital de Elevación SRTM 30 Metros. Colombia. Año 2011) and were calculated according to the percentage of the slope. Slope classes represented as a similar ratio between gentle slope (<15%) and steep slope (>=15%) in the project and RRD areas (+/-20%). (See Annex 38)
	Soil	The soils were estimated from the soil database for Latin America and the Caribbean SOTERLAC v 2.0³⁸ and the soil map of the Colombian territory at a scale of 1:100,000 extracted for the department of Chocó³⁹. The main group of soils that covers both the project area and the RRD is the Humic Dystrudepts; Typic Eutrudepts, whose proportion in the DRR is 26% compared to 44% for the type of soil in the project area, being the highest proportion in the two areas, are the ones predominantly used by deforestation agents. Therefore the criterion is met. See details in Annex 38
Transportation Networks and	Navigable Rivers	The river information was obtained from the base cartography Scale 1:100,000 for Colombia⁴⁰, developed by the Agustín Codazzi Geographic Institute.

human infrastructure		Navigable rivers density (m/km ²) present in both project and RRD areas is similar (withing +/-20% variance). See details in Annex 38
	Road density	The road information to calculate the road density was obtained from the base cartography Scale 1:100,000 for Colombia ⁴¹ , developed by the Agustín Codazzi Geographic Institute. Road density (m/km ²) at the start of reference period for project area and RRD is similar (+/-20%). See details in Annex 38
	Settlement density	The information on settlement to calculate the settlement density was obtained from the 1:100,000 Scale base cartography for Colombia ⁴² , developed by the Agustín Codazzi Geographic Institute. Settlements/km ² is the same (+/-20%) for non-forested areas in a 1 km buffer around the project area at the start of baseline period, as in RRD at the start of reference period. See details in Annex 38
Social factors	Social factors	Ethnic composition is similar, as they are security conditions
Policies and Regulations	Policies and Regulations	Both RRD and project areas have the same legal status regarding land tenure, ownership and right of use of natural resources, and self-government status
Exclusion of planned deforestation	Exclusion of planned deforestation	Planned deforestation areas are excluded in both RRD and project area.

5.1.3 Definition of temporal limits

According to the selected methodology, the following time limits were considered:

³⁶ <http://documentacion.ideam.gov.co/openbiblio/bvirtual/000689/Capitulo5.pdf>

³⁷ <https://www.colombiaenmapas.gov.co/?e=-77.3621641894563,0.4537392301313095,-66.20005481445926,5.936259017224552,4686&b=igac&u=0&t=23&servicio=159>

³⁸ <https://data.isric.org/geonetwork/srv/api/records/436bd4b0-7ffc-4272-be57-686b7d7eea7d>

³⁹ <https://geoportal.igac.gov.co/contenido/datos-abiertos-agrologia>

⁴⁰ <https://geoportal.igac.gov.co/contenido/datos-abiertos-cartografia-y-geografia>

⁴¹ <https://geoportal.igac.gov.co/contenido/datos-abiertos-cartografia-y-geografia>

⁴² <https://geoportal.igac.gov.co/contenido/datos-abiertos-cartografia-y-geografia>

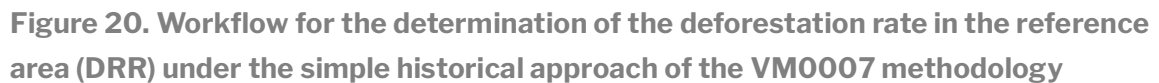
Historical reference period: for the projection of deforestation under the historical approach, the reference period corresponds to the years elapsed between three spatial data points. Considering the availability of satellite images for the classification and delimitation of forest areas, the selected historical reference period was 2002-2007-2014 (12 years in the past with respect to the start date of the project).

- REDD project accreditation period: the selected accreditation period was 2014 and ends on March 31, 2044, 30 years from the project start date. The possibility of renewing the project for an additional period of 30 years will be considered, for a total accreditation period of 60 years.
- Date for revalidation of the baseline: considering that the baseline must be renewed every 6 years after the start date of the project, the date for this revalidation is until 2020. The project will update its baseline according to the parameters established by the standard, and the baseline will be updated for the next verification, maintaining compliance with the renewal of the baseline every six years or as provided by the most recent guidelines established by the standard.
- Monitoring Period: from April 1, 2014 to December 31, 2020

5.1.4 Estimation of annual unplanned deforestation areas under the simple historical approach

STEP 1. Analysis of historical deforestation

This step consisted of quantifying the historical deforestation rate during the historical reference period (2002-2014) within the selected DRR. The analysis was prepared based on secondary information, documentation of projects registered under the same methodology and a combination of methods proposed by GOF-C-GOLD (2017) for monitoring forest cover of REDD+ projects.



- The information on land cover and use was constructed from information from satellite images such as Landsat with a medium resolution of (30 m) (Heumann, 2011), in this project an inventory and a compilation of medium resolution images were carried out, which allow differentiate the forest cover in the reference area in which the agents of deforestation present other characteristics and other dynamics.

In the inventory, different satellite images from different sensors (Landsat 7 and Landsat 8, Sentinel-2-MSI) were considered, acquired free of charge by the team through different distribution portals⁴³. The selected images allow to represent the territorial dynamics of the project area and represent an ideal reference area (DRR) from a spatial point of view.

- Mapping of historical deforestation

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Deforestation mapping was carried out by detecting changes from forest to No Forest in the period 2002-2007 and 2007-2014, classifying the images in three phases: preprocessing; classification; and post processing.

- Preprocessing

The cartographic pre-processing for the calculation of deforestation consisted in the application of techniques for the correction and improvement of the images by type of images, Sentinel-2, Landsat 7 and Landsat 8. A correction of the atmospheric interference was applied applying the Sen2Cor model (Louis, et al., 2016) and S2 resampling for all bands at 10 m (Hedley, et al., 2018). For Landsat 7 and 8 images, a geometric correction was made in at least 15 points to adjust the images to the topography of the base image (2015) with higher resolution. Tables 33 and 34 describe the wavelengths and pixel size of each of the spectral bands of the sensors used.

Table 32. Description of the spectral bands of the sensor Landsat 7

Channel	Wavelength (µm)	Pixel size (m)
1 Band	0.45~0.52	30
2 Band	0.52~0.60	30
3 Band	0.63~0.69	30
4 Band	0.77~0.90	30
5 Band	1.55~1.75	30
6 Band	10.40~12.50	60 (30)
7 Band	1.55~1.75	30
8 Band	0.52~0.90	15

Table 33. Description of the spectral bands of the sensor Landsat 8

Channel	Wavelength (µm)	Pixel size (m)
1 Coastal	0.43~0.45	30
2 Blue	0.45~0.51	30
3 Green	0.53~0.59	30
4 Red	0.63~0.67	30
5 Near Infrared (NIR)	0.85~0.88	30
6 SWIR 1	1.57~1.65	30
7 SWIR 2	2.11~2.29	30
8 Panchromatic	0.50~0.68	15
9 Cirrus	1.36~1.38	30
10 Thermal Infrared (TIRS) 1	10.6~11.19	100
11 Thermal Infrared (TIRS) 2	11.50~12.51	100

Classification and interpretation

This process aims to generate thematic extension cartography, distribution and changes in forest cover. At this stage, usually programs or algorithms to establish a classification into the general categories are used: Forest, Non Forest and Without Information and then quantify the areas of change and deforestation data (Morton et al, 2005; Asner et. al, 2009; Cabrera et al 2011).

According to the methodology, the approach selected for analysis is the detection of post-classification changes. In terms of procedures, to classify satellite images the methodology does not require a specific classification algorithm but suggests that an automated sorting process be done to make cartography production more efficient. In this sense the method used is SVM (Support Vector Machine) for details about the algorithm consult at: A tutorial on support vector machines for pattern recognition of Christopher JC Burges.

Cartographic production involved the following phases:

Calculate image statistics: In classification process, is carries out one process of training based on the characteristics of each pixel intensity. In order to compare these characteristics between each of the images to "train" the first step is the estimation of the image statistics. These statistics will be used to focus and reduce the intensities of the samples based on the vector data selected by the user. Here the mean and standard deviation of each band is calculated (Centre National d'Etudes Spatiales (CNES), 2014).

Selection of the training areas: On the image polygons representative of each class are selected, considering the spectral signature of each path polygon of a similar class. Each class is identified by a specific code.

Image classification: For each pixel an accuracy test is performed with respect to the training areas with different cost parameters made by SVM classification algorithm. The performance of the model generated by the application of the classification in Qgis is estimated directly from the application used (TrainImagesClasifier), showing the accuracy of each class and generates an overall confusion matrix as a result (Centre National d'Etudes Spatiales (CNES, 2014).

Filtered: The minimum mapping unit (MMU) used is 1 Ha according to the definition of national forest. To maintain consistency with MMU a spatial filter is applied to all mosaics generated for each date. For Landsat images, with which the maps of the first date are produced, a filter of 9 pixels with 8 pixel connectivity is applied.

Post classification

The post-classification was done in the ArcGIS 10.6 software, with which a class-by-class visual inspection was made and the mixed classes of the classification were corrected. The results of LULC for RRD is showed in Table 34.

Table 34. Result of the classification of images for the identification of LULC in the RRD region

LULC	Area (ha)		
	2002	2007	2014
Forest	151059,56	141122,12	134337,64
Mangrove	11254,11	10979,07	10182,06
Grasslands	0	3150,59	2551,30
Pastures and crops	0	40702,83	13079,74
Sand	0	396,96	129,48
Urban areas	0	30,26	15,02
Water	0	1931,85	2018,44

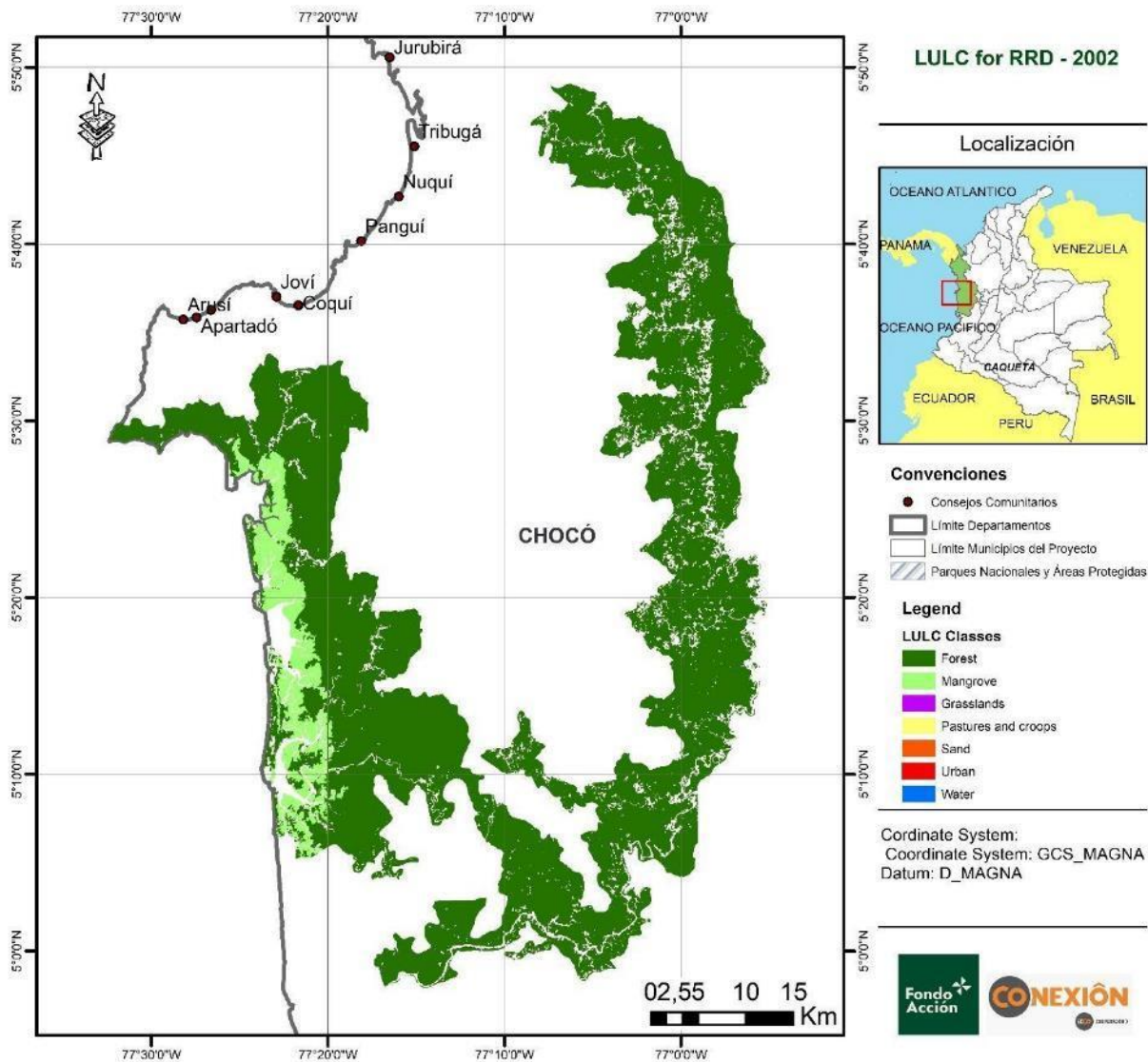


Figure 21. RRD LULC classification result, year 2002.

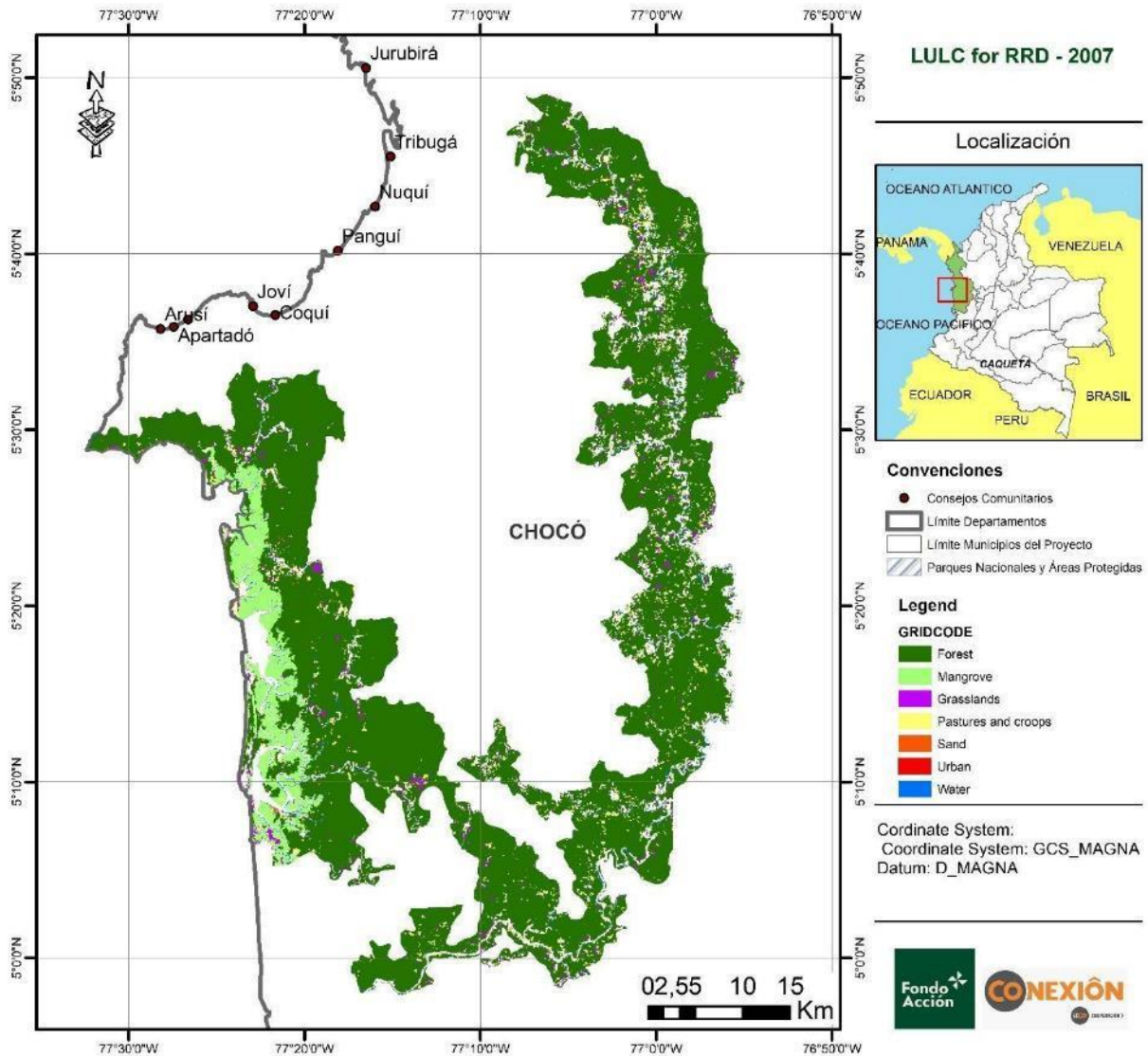


Figure 22. RRD LULC classification result, year 2007.

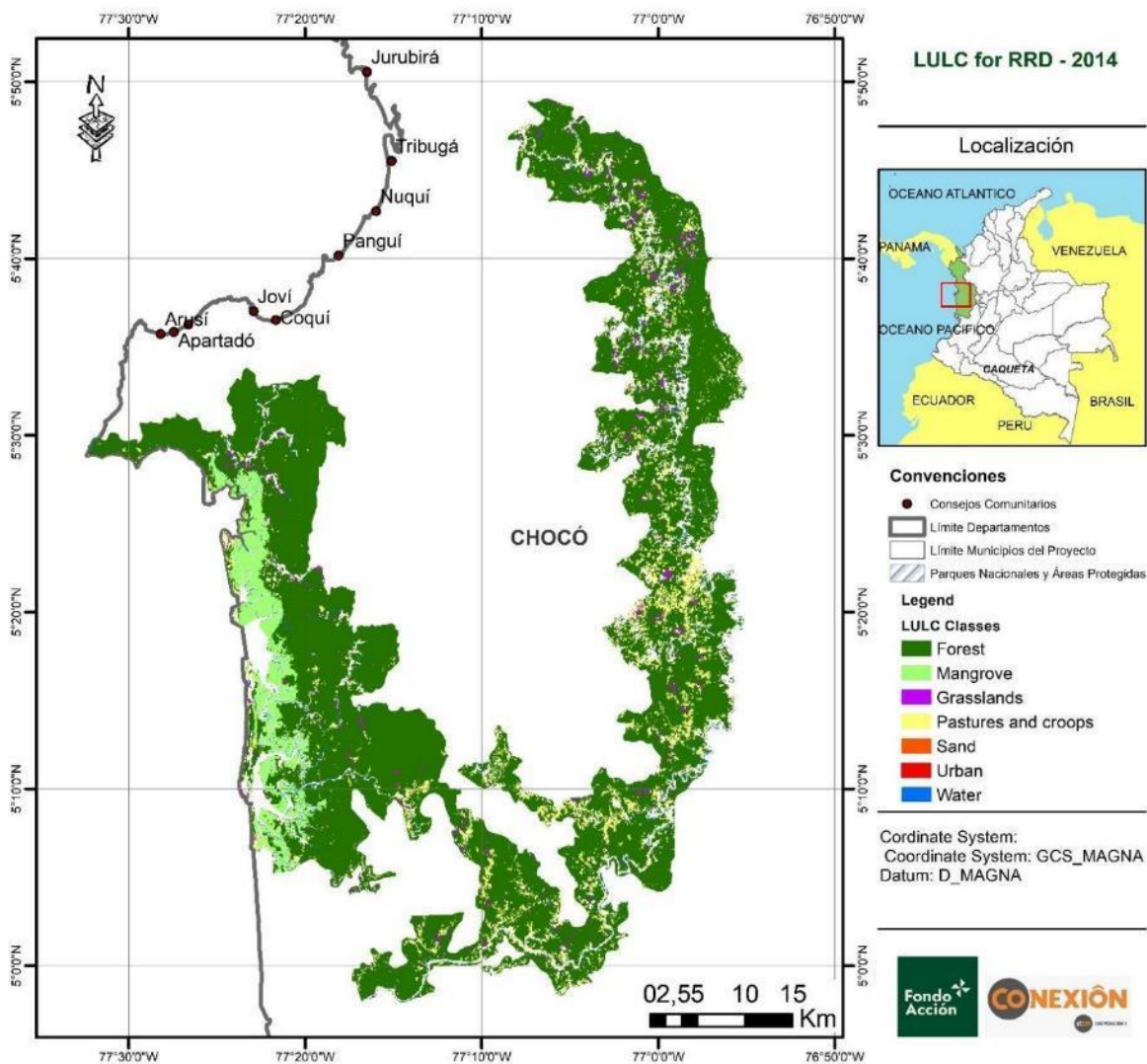


Figure 23. RRD LULC classification result, year 2014.

Change detection was performed after classification and semi-automated classification correction for the reference region boundaries (RRD) only. To quantify these changes in the analyzed historical period, basic cross-tabulation techniques were used to identify the changes in proportion and location between Forest and Mangrove covers versus non-Forest covers. The cross tabulation represents in a real way the occurrence of deforestation in the reference area.

- Calculation of historical deforestation

The result of the historical deforestation analysis shows the Forest and Mangrove areas and the other land uses (No Forest) at the beginning and end of the historical period (2002 and 2014, respectively). From these values, the number of deforested hectares

was calculated in each interval that comprises the historical reference period; that is, 2002-2007 and 2007-2014. The results are presented in Table 35 and Table 36.

- Assessment of map accuracy

To validate the classification, an accuracy assessment was conducted using SPOT 5 images from 2012 to 2015. Due to the high cloud cover in the area, the range of image selection for validation was expanded. The images used are panchromatic and multispectral. Some of the validation sampling points were verified in high-resolution image mosaics available online, such as those from ESRI Satellite and Google Earth.

Table 1. SPOT 5 images for accuracy assessment

Satellite	General Name	Name Scene	Date
SPOT 5	S5_639-340-0_2012-04-14-15-45-34_HRG-2_J_MX_TT	002-005_S5_639-340-0_2012-04-14-15-45-34_HRG-2_J_MX_TT	14/04/2012
SPOT 5	S5_639-339-6_2012-04-14-15-45-25_HRG-2_J_MX_TT	001-005_S5_639-339-6_2012-04-14-15-45-25_HRG-2_J_MX_TT	14/04/2012
SPOT 5	S5_639-339-0_2012-04-25-15-32-48_HRS-1_S_MX_TT	004-011_S5_639-339-0_2012-04-25-15-32-48_HRS-1_S_MX_TT	25/04/2012
SPOT 5	S5_639-339-0_2013-10-23-15-12-03_HRS-2_S_MX_TT	005-008_S5_639-339-0_2013-10-23-15-12-03_HRS-2_S_MX_TT	23/10/2013
SPOT 5	S5_639-340-0_2012-04-25-15-32-57_HRS-1_S_MX_TT	005-011_S5_639-340-0_2012-04-25-15-32-57_HRS-1_S_MX_TT	25/04/2012

The non-forest land cover classes of the classification, and the Forest and Mangrove categories were combined as Forest, to achieve accuracy validation. This is in accordance with the BL-UP module, which establishes that: The minimum map accuracy must be 90% for both the "forest" class and the "non-forest" class. The error matrix for the accuracy assessment yielded an overall accuracy of 91.78% and an accuracy between classes of between 91.9% for forest areas and 91.3% for non-forest areas.

Table 2. Error Matrix for Assessment

Visual Validation (sampling)	Error Matrix					
Map	Forest	Non Forest	TOTAL	User Accuracy (%)	Commission Error (%)	
Bosques	113	10	123	91,9	8,1	
No Bosque	2	21	23	91,3	8,7	
	115	31	146			
				Precisión Global	91,78	

On the other hand, according to the BL-UP module, when an accuracy assessment of past imagery is not possible due to the unavailable field data, aerial photographs, or high-resolution imagery (resolution = 5 m) for the applicable time period, it is assumed that the classification algorithm used for the most recent image, which should achieve a

minimum accuracy level of 90% for the map, is applicable to past imagery and will achieve the same accuracy.

For the Los Riscas REDD+ project, the image classification algorithm used for 2014 is SVM (Support Vector Machine). When evaluating LULC classification accuracy using this algorithm, both class-by-class and overall accuracy are assessed.

Using the *TrainImagesClassifier*, the performance of a classification model was estimated for the most recent project image (2014) based on the LULC classification map. This classified image is compared to positive reference samples (represented as a labeled raster image or as vector data containing the reference classes). The confusion matrix (Annex 69. Confusion Matrix and Annex 76. Accuracy_Assessment), precision, recall, and Fisher coefficient (F) were calculated for each class.

This evaluation was performed for all project coverage and usage classes, identified by a unique code for each class:

Cod e	Reference Classes LULC
1	Forest
2	Mangrove
3	Grasslands
4	Pastures and Crops
5	Sand
6	Urban areas
7	Water
8 - 9	Clouds and Shadows

According to the results, the estimated Kappa index is 0.95 on a scale of 0 to 1. In this way, the accuracy assessment for the dates of 2007 and 2002 is validated

```
(INFO) TrainImagesClassifier: Precision of class [1] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [1] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [1] vs all: 1

(INFO) TrainImagesClassifier: Precision of class [2] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [2] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [2] vs all: 1

(INFO) TrainImagesClassifier: Precision of class [3] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [3] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [3] vs all: 1

(INFO) TrainImagesClassifier: Precision of class [4] vs all: 0.714286
(INFO) TrainImagesClassifier: Recall of class [4] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [4] vs all: 0.833333

(INFO) TrainImagesClassifier: Precision of class [5] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [5] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [5] vs all: 1

(INFO) TrainImagesClassifier: Precision of class [6] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [6] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [6] vs all: 1

(INFO) TrainImagesClassifier: Precision of class [7] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [7] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [7] vs all: 1

(INFO) TrainImagesClassifier: Precision of class [8] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [8] vs all: 0.6
(INFO) TrainImagesClassifier: F-score of class [8] vs all: 0.75

(INFO) TrainImagesClassifier: Precision of class [9] vs all: 1
(INFO) TrainImagesClassifier: Recall of class [9] vs all: 1
(INFO) TrainImagesClassifier: F-score of class [9] vs all: 1

(INFO) TrainImagesClassifier: Global performance, Kappa index: 0.95
```

On the other hand, the error matrix was estimated for 2014, through a random sampling of 206 points compared with the Forest / Non-Forest maps of the Forest and Carbon monitoring system for the same year. It is important to mention that the Forest / Non-Forest maps of the Carbon monitoring system are validated through a thematic accuracy assessment procedure, according to the NREF reference level in force for Colombia. This procedure applies estimates of global accuracy, user accuracy (or commission error) and producer accuracy (or omission error) following the recommendations developed by Olofsson et al. (2014), estimated through the assessment of the accuracy of the forest changes map. This procedure is developed from a stratified sampling, where each sample is validated by interpretation of high-resolution images, the result of which feeds the error matrices to assess the accuracy of the maps.

	Error Matrix				
Reference Map IDEAM 2014	Forest	Non-Forest	TOTAL	User Accuracy (%)	Commission Error (%)
Classification Map					
Forest	172	1	173	99,4	0,6
Non-Forest	3	30	33	90,9	9,1
	175	31	206		
				Overall Accuracy	98,06

The non-forest cover classes of the classification, and the Forest and Mangrove categories were combined as Forest, to achieve accuracy validation. This is in accordance with the BL-UP module, which establishes that: "The minimum map accuracy must be 90% for both the "forest" class and the "non-forest" class". To validate the classification, an error matrix was used, which yielded an overall accuracy of 98.06% for 2014 and an accuracy between classes of 99.4% for Forest and 90.9% for Non-Forest.

Table 35. Matrix of change LULC of the reference region RRD, period 2002-2007.

2007 (Ha)							
2002 (Ha)	Forest	Mangrove	Grassland	Pastures and crops	Sand	Urban	Water
Forest	141586,19	0	3082,95	4582,15	304,39	29,33	1474,54
Mangrove	0	10514,99	67,64	120,68	92,57	0,92	457,31
Grassland	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Pastures and crops	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Sand	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Urban	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Water	0,00	0,00	0,00	0,00	0,00	0,00	0,00

2014 (Ha)							
2007 (Ha)	Forest	Mangrove	Grassland	Pastures and crops	Sand	Urban	Water
Forest	129713,17	0	1785,16	9273,85	18,12	4,67	327,14
Mangrove	0	10498,14	30,22	270,81	28,22	0,26	151,42
Grassland	1625,83	40,17	355,38	1091,45	6,57	2,14	29,05
Pastures and crops	2032,77	83,60	345,41	2157,27	7,14	5,67	70,97
Sand	133,52	55,84	13,95	88,05	32,14	1,02	72,43
Urban	6,39	0,00	3,58	18,02	0,01	1,27	0,98
Water	229,71	100,54	17,58	180,28	37,28	0,00	1366,45

Table 36. Matrix of change LULC of the reference region RRD, period 2007-2014.

STEP 2. Estimation of the annual areas of unplanned baseline deforestation in the RRD

The estimation of unplanned deforestation areas in the RRD was carried out using equation 3 of the BL UP module. This equation corresponds to approach 1 proposed by the BL-UP module; historical deforestation rate during the historical reference period⁴⁴.

⁴⁴ According to the BL-UP module, to be applied, any regression must be significant ($p \leq 0.05$), must have an $r^2 \geq 0.75$ and must be free of bias (demonstrated through the selection of the adjustment with the lowest residuals). Considering the spatial information available for the project area in the period 2002-2014, it is not possible to estimate a linear regression,

$$A_{BSL,RRD,unplanned,t} = \frac{A_{RRD,unplanned,hrp}}{T_{hrp}}$$

Where

$A_{BSL,RRD,unplanned,t}$ Projected area of unplanned baseline deforestation in the RRD in year t; ha

$A_{RRD,unplanned,hrp}$ Total area deforested during the historical reference period in the RRD; ha

T_{hrp} Duration of the historical reference period in years; yr

t 1, 2, 3, ... t* years elapsed since the projected start of the project activity.

Thus, the annual area of unplanned deforestation in the RRD under the baseline scenario (ABSL, RRD, unplanned, t), according to historical deforestation analysis, is 1414,6 ha/year.

Table 37. Unplanned deforested area in the RRD under the baseline scenario, period 2002-2014. For forest area

Year	Projected area of unplanned baseline deforestation in the RRD (ha). Forest	Projected annual unplanned deforestation area for RRD (ha/year). Forest
2002 - 2007	9473,4	1894,7
2007 - 20014	11408,9	1629,8
Total deforested area in the historical reference period (2002-2014)		1856,2

Source: FA technical team

Table 38. Unplanned deforested area in the RRD under the baseline scenario, period 2002-2014. For Mangroves

because there are only two analysis periods, and it is not enough to obtain a regression with values significant. Since no significant regression was obtained, approach 1 (historical deforestation rate during the historical reference period) was selected as an approximation to define the deforestation baseline.

Year	Projected area of unplanned baseline deforestation in the RRD (ha). Mangroves	Projected annual unplanned deforestation area for RRD (ha/year). Mangroves
2002 - 2007	739.1	147.8
2007 - 2014	480.9	40.1
Total deforested area in the historical reference period (2002-2014)		68.2

Source: FA technical team

STEP 3. Estimation of annual unplanned deforestation areas in the PA (Project Area) under the baseline scenario.

Projected annual unplanned deforestation areas for the project area under the baseline scenario were estimated using equation 5 of the VCS module VMD0007 (BL-UP). The ratio between the project area and the total area of the RRD ($\frac{P_{PA}}{P_{PA}}$) was 0,172.

$$A_{BSL,PA,unplanned,t} = A_{BSL,RRD,unplanned,t} * P_{PA}$$

Where:

$A_{BSL,PA,unplanned,t}$ Projected area of unplanned baseline deforestation in the project area in year t ; ha

$A_{BSL,RRD,unplanned,t}$ Projected area of unplanned baseline deforestation in the RRD in year t ; ha

$\frac{P_{PA}}{P_{PA}}$ Ratio of the project area to the total area of RRD; dimensionless

t 1, 2, 3, ... t^* years elapsed since the projected start of the project activity.

The total cumulative area of unplanned deforestation in the project area under the baseline scenario was estimated using equation 7 of the VCS module VMD0007 (BL-UP), as follows:

$$A_{BSL,PA,unplanned} = \sum_{t=1}^{t^*} A_{BSL,PA,unplanned,t}$$

Where:

$A_{BSL,PA,unplanned}$ Total area of unplanned baseline deforestation in the project area; ha

$A_{BSL,PA,unplanned,t}$ Projected area of unplanned baseline deforestation in the project area in year t ; ha

t 1, 2, 3, ... t^* years elapsed since the projected start of the project activity.

Table 39 presents the projected annual unplanned deforestation and accumulated deforestation for the PA during the project's accreditation period.

Table 39. Projected annual unplanned deforestation and accumulated deforestation for the PA during the project's accreditation period.

Project year	Calendar year	Projected annual unplanned deforestation	Projected annual unplanned deforestation
		ABSL,PA,unplanned,t (ha) Forest	ABSL,PA,unplanned,t (ha) Mangrove
0	2014	226.94	226.94
1	2015	302.59	529.53
2	2016	302.59	832.12
3	2017	302.59	1134.71
4	2018	302.59	1437.30
5	2019	302.59	1739.89
6	2020	302.59	2042.47
7	2021	302.59	2345.06
8	2022	302.59	2647.65
9	2023	302.59	2950.24
10	2024	302.59	3252.83
11	2025	302.59	3555.42
12	2026	302.59	3858.01
13	2027	302.59	4160.60
14	2028	302.59	4463.19
15	2029	302.59	4765.77
16	2030	302.59	5068.36
17	2031	302.59	5370.95
18	2032	302.59	5673.54
19	2033	302.59	5976.13
20	2034	302.59	6278.72
21	2035	302.59	6581.31
22	2036	302.59	6883.90
23	2037	302.59	7186.48
24	2038	302.59	7489.07
25	2039	302.59	7791.66
26	2040	302.59	8094.25
27	2041	302.59	8396.84
28	2042	302.59	8699.43
29	2043	302.59	9002.02
30	2044	75.65	9077.66

5.1.5 Estimation of changes in carbon sinks and GHG emissions

The estimation of changes in carbon sinks and GHG emissions was developed from the following four sub-steps:

5.1.5.1 STEP 1. Stratification of total area subject to deforestation in the PA

Pre-deforestation Strata

The forest stratification was developed using available spatial data such as a Digital Elevation Model (DEM), soil, land cover types, climate, and topography. No measurements of biomass plot density or carbon stock density were used in the forest stratification process. The features of each strata include different ranges of soil types (e.g. texture, Ph, etc.), surface elevation and slopes, distinct climate zones, and general land cover (forest and non-forest) that are used to separate forests with different structure and biomass.

To carry out the stratification process, the methodological procedures defined by VM0007 and its tool VMD0016 “Methods for stratifying the project area (X-STR). Two main strata were developed, considering the homogeneous characteristics regarding forest types, soil, elevation, hydrological conditions, and land cover. Allometric functions have been especially developed for such strata, as they are typical of the Pacific’s Choco region in Colombia. See Table 40.

Table 40. Typical strata of the Pacific’s Choco region in Colombia.

Strata	Characteristic
Mangrove (II)	Beach front, key for maintaining fish banks
Forest (I)	Land with slope characteristics which make access and permanent activity difficult, used for selective logging and for crops in lower sections

Figure 24 shows the result of forest stratification in the project area. In 2018, 5 transects were designed, each with 50 points, for a total of 250 sampling points, of which 86 were selected for the establishment of circular plots. It is important to clarify that the information from the plots was not included in the stratification of the forests in the project area, nor was it considered for the estimation of carbon content since, according to the VMD007 – BL-UP module: “Each forest stratum will be represented by a carbon stock estimated within 2 years before the project start date”. Considering that the start date of the project is 2014, this information cannot be used since it exceeds the period described in the module.

Due to the above, the establishment and information derived from the 85 plots will be considered as one of the activities of the project for the conservation of the forests.

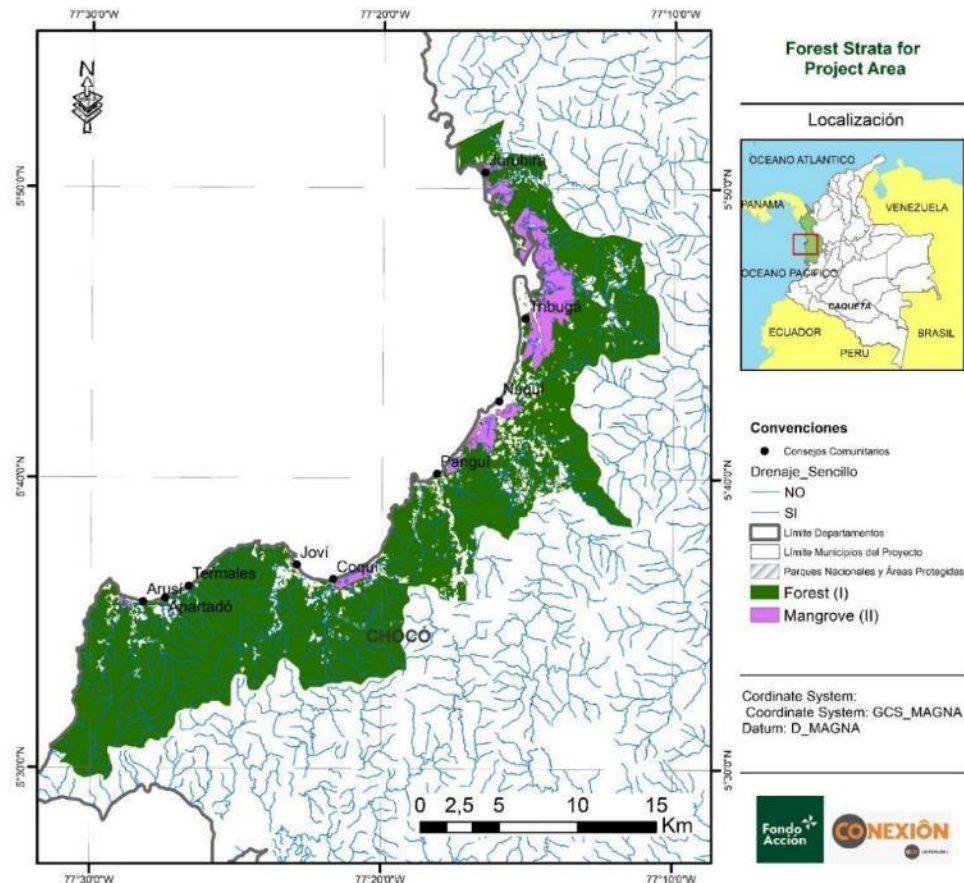


Figure 24. Stratification map for Project Area

Post deforestation Strata.

As described in the section Estimation of annual unplanned deforestation areas under the simple historical approach, to build the land cover and use maps, the images were preprocessed and subsequently processed, segmenting images and classifying them through supervised classification.

LULC Classification and Forest Stratification

LULC Classes

Image pixels were classified as one of the following seven land cover classes:

Table 41. LULC Classes

LULC	
1	Forest
2	Mangrove
3	Grasslands
4	Croplands and Pastures
5	Sand
6	Settlements
7	Water

Forest Stratification:

The project area is composed of a system of tropical rainforests, characteristic of the ecoregion of the Colombian Pacific. Moreover, the Los Riscales council is located on the coastal line of the Colombian Pacific, permitting it the presence of mangroves in the area.

Due to the different ecosystem, species composition and structural differences, the project area was stratified into:

- Tropical moist forest
- Mangrove forest.

Based on this stratification, the transitions from forest to non-forest were developed as follows:

Table 42. Expected LULC transitions and descriptions.

Expected LULC Transition	Description
Forest to Grassland	Forest to grasslands implies that is in the process of being logged illegally transitions to Grasslands
Forest to Croplands and pastures	Forest to pastureland implies aggressive illegal logging of forest with the end land use for crops or grazing.
Forest to Sand	Forest to Sand implies losses of forest for sand close to the rivers
Forest to Settlements	Forest to settlement implies the rapid illegal logging of forest for the construction of housing, roads and other infrastructure.
Forest to Water	Forest to Water
Mangrove to Grassland	Mangrove to pastureland implies that is in the process of being logged illegally transitions to Grasslands
Mangrove to Croplands and pastures	Mangrove to pastureland implies aggressive illegal logging of forest with the end land use for crops or grazing.
Mangrove to Sand	Mangrove to Sand implies losses of forest for sand close to the rivers
Mangrove to Settlements	Mangrove to settlement implies the rapid illegal logging of forest for the construction of housing, roads and other infrastructure.
Mangrove to Water	Mangrove to Water

Historical Land Use Summary

Historical land use in the reference area RRD is summarized in the table below (see Table 43). This table shows a loss of forest cover and increase in non-forest land use over time.

Table 43. Reference region LULC classifications (hectares) for each scene in the reference period

	2002 (Ha)	2007 (Ha)	2014 (Ha)
LULC	RRD	RRD	RRD
Forest	151,059.56	141,122.12	134,337.64
Mangroves	11,254.11	1,0979.07	10,182.06
Grasslands		3,150.59	2,551.30
Croplands and pastures		4,702.83	13,079.74
Sand		396.96	129.48
Settlements		30.26	15.02
Water		1931.85	2,018.44

Stock changes in belowground biomass and dead wood are emitted at an annual rate, of 1/10 of the stock change for 10 years and at an annual rate of 1/20 of the stock change for 20 years for soil organic carbon (for non-wetland soils) (BL_UP).

Determining Emissions Factors

Table 44. Emission factor for forest and non-forest in the project.

LULC Class	C_{AB_tree} (tC/ha)	C_{nt} (tC/ha)	C_{BB_tree} (tC/ha)	C_{DW} (tC/ha)	$C_{LI,l}$ (tC/ha)	COS (tC/ha)	$C_{BBnontre}$ (tC/ha)
Forest	108,9	5.44	2.45*	0.7*	2.1*	3.25	0.2*
Mangrove	103,56	0	5.07	1.07*	0.7*	0	0
Grassland	2,91	0	5,25	0	0	0	0
Cropland and Pastures ⁴⁵	0	0	0	0	0	0	0
Sand	0	0	0	0	0	0	0
Settlement	0	0	0	0	0	0	0
Water	0	0	0	0	0	0	0

*Non-significant sinks, since they contribute less than 5% of the total carbon content of the stratum. (see T-SIG).

** Pools not considered due to inaccuracy in their estimation, non-permanence, uncertainty and variability due to the flood conditions to which they are subjected.

5.1.5.2 STEP 2 Estimation of carbon stocks changes per stratum

Measure and Calculate Carbon Stock Density

Forest Strata

⁴⁵ Accord to AR-Tool14. Carbon stock in the baseline can be accounted as zero if all of the following conditions are met: Land is subjected to periodic cycles (e.g. slash-and-burn, or clearing-regrowing cycles) so that the biomass oscillates between a minimum and a maximum value in the baseline.

Estimates of carbon content for each type of forest stratum were calculated based on information from national entities. It was necessary to carry out this process as a methodological deviation (see section 3.6 above), because the project did not meet the condition of gathering information on carbon content, two years before the project start date, as it is set by module VMD0007 BL-UP V3.3, section 4.2.1 which determines that, for the estimation of the Forest Carbon Stocks, each identified stratum must be represented by an estimated carbon stock 2 years before the start date of the project.

The sources of information for forest and mangrove were as follows (see value in annex 19):

Forest: 231.7 t dm. ha-1

National network of plots, which includes sampling areas in the Colombian Pacific. Phillips et al. IDEAM 2014. (See Figure 13, above)

Mangrove forest: 220.3 t dm. ha-1

Plots, characterization of mangrove forests Gulf of Tribuga. Vieira, et al 2014 (See Figure 14 above). and Yepes et al. 2015.

The above information is provided by and for national agencies, in order to carry out carbon and emissions accounting in the country, and also complies with the time requirement with respect to the dates established in the BL-UP (year 2014, year of start of the project). Likewise, it is compatible with the balances established by the national government, for the national accounting of greenhouse gases for the AFOLU sector.

Carbon stocks in below ground tree biomass (CBB_tree):

In accordance with the applied methodology, carbon stocks in the below ground tree biomass pool have been estimated based on the data on above ground tree biomass obtained from applying the allometric function and the root to shoot ratio (below ground biomass fraction) proposed by IPCC. Below ground tree biomass for each sample plot has been estimated using the following equation:

$$C_{BB_{forest}} = R * C_{AB_{forest, i}}$$

Where:

$C_{BB_{forest}}$ = Belowground Forest biomass carbon stock of tree, in stratum i , tC

$C_{BA_{forest}}$ = Aboveground Forest biomass carbon stock of tree, in stratum i , tC

R = Root to shoot ratio; t root d.m/t shoot d.m

i = 1,2,3 .. M strata

For Forest:

$$R = -1.085 + 0.9256 * \ln(AGB) \quad R = -1.085 + 0.9256 * \ln(AGB) \quad \text{Yepes et al, IDEAM, 2011}^{46}$$

For mangrove forest:

$$R = 0.49 \quad \text{IPCC 2006}^{47}$$

For estimation in other carbon sinks, they implemented the metalogic tools as follows:

Non tree biomass (Cnt).

For the previous thing, the biomass in was calculated according to AR-Tool 14, section 11 (only shrubs). Its estimation way does not imply any plots assembly in land:

$$C_{SHRUB,t} = \frac{44}{12} \times CF_s \times (1 + R_s) \times \sum_i A_{SHRUB,i} \times b_{SHRUB,i}$$

Where:

$C_{SHRUB,t}$	= Carbon stock in shrubs within the project boundary at a given point of time in year t; tCO ₂ -e
CF_s	= Carbon fraction of shrub biomass; t C (t.d.m.) ⁻¹ A default value of 0.47 is used unless transparent and verifiable information can be provided to justify a different value.
R_s	= Root-shoot ratio for shrubs; dimensionless. The default value of 0.40 is used unless transparent and verifiable information can be provided to justify a different value.
$A_{SHRUB,i}$	= Area of shrub biomass estimation stratum i; ha
$B_{SHRUB,i}$	= Shrub biomass per hectare in shrub biomass estimation stratum i; t d.m. ha ⁻¹
BDR_{sf}	= Ratio of shrub biomass per hectare in land having a shrub crown cover of 1.0 (i.e. 100 per cent) and the default above-ground biomass content per hectare in forest in the region/country where the project activity is located; dimensionless. A default value of 0.10 ⁴⁸ should be used unless transparent and verifiable information can be provided to justify a different value.
b_{FOREST}	= Default above-ground biomass content in forest in the region/country where the project activity is located; t d.m. ha ⁻¹ .

⁴⁶ Yepes A.P., Navarrete D.A., Duque A.J., Phillips J.F., Cabrera K.R., Álvarez, E., García, M.C., Ordoñez, M.F. 2011. Protocolo para la estimación nacional y subnacional de biomasa - carbono en Colombia. Instituto de Hidrología, Meteorología, y Estudios Ambientales-IDEAM-. Bogotá D.C., Colombia. 162 p.

⁴⁷ IPCC 2006. COASTAL WETLANDS Cap 4, Tropical Humid 0.49 (n=18).

⁴⁸ From AR-AM-Tool-14-v4.2

$CC_{SHRUB,i}$ = Crown cover of shrubs in shrub biomass estimation stratum i at the time of estimation, expressed as a fraction (e.g. 10 per cent crown cover implies $CC_{SHRUB,i} = 0.5$; dimensionless).

Carbon stock in dead wood and Litter.

Due to the impossibility of applying the CP-L tool, the following, the estimation of this component follows the methodological tool, AR-TOOL12 "Estimation of carbon stocks and change in carbon stocks in and litter in project activities."

The methodological tool recommends two ways for estimating the carbon content in the litter and deadwood components. For the current calculation, the conservative method of default factors will be used for the current calculation.

Carbon stocks in dead wood (CDW)

To estimation of this component follows the methodological tool, AR-TOOL12 "Estimation of carbon stocks and change in carbon stocks in and litter in project activities."

The methodological tool recommends two ways for estimating the carbon content in the litter and deadwood components. For the current calculation, the conservative method of default factors will be used for the current calculation.

This methodological process assumes that deadwood is not removed and remains on the forest soil. This assumption is what happens in the project activities by natural mortality of some individuals. Your way of calculating for dead wood is defined by:

Your way of calculating for dead wood is defined by:

$$C_{DW,i,t} = C_{TREE,i,t} \times DF_{DW} \quad C_{DW,i,t} = C_{TREE,i,t} \times DF_{DW} \quad \text{Equation 9 Tool.}$$

$C_{DW,t}$	=	Carbon stock in dead wood within the project boundary at a given point of time in year t , t CO ₂ -e
$C_{TREE,i,t}$	=	Carbon stock in trees biomass in stratum i at a point of time in year t , as calculated in the tool. tCO ₂ -e
DF_{DW}	=	Conservative default factor expressing carbon stock in dead Wood as a percentage of carbon stock in tree biomass, %.
i	=	1,2,3,... biomass estimation strata within the project boundary
t	=	1,2,3,... years elapsed since the start of the project activity

Where:

- Carbon Litter (L).

It is conservatively estimated with default factors for estimating carbon content of this pool.

$$C_{LI,i,t} = C_{TREE,i,t} \times DF_{LI} \quad C_{LI,i,t} = C_{TREE,i,t} \times DF_{LI} \quad \text{Equation 15 of tool.}$$

$C_{LI,i,t}$	=	Carbon stock in litter in stratum i at a given point of time in year, t CO ₂ -e
$C_{TREE,i,t}$	=	Carbon stock in trees biomass in stratum i at a point of time in year t , as calculated in tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in project activities". tCO ₂ -e
DF_{LI}	=	Conservative default factor expressing carbon stock in litter as a percentage of carbon stock in tree biomass; percent, %.
i	=	1,2,3,... biomass estimation strata within the project boundary
t	=	1,2,3,... years elapsed since the start of the project activity

Where:

Soil Organic Carbon stocks (SOC).

Likewise, for the estimation of soil organic carbon contents, the processes of the "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities" was developed, based on the default values established by the IPCC 2003. The estimate is developed from the beginning that the carbon in the soil, after its transformation is lost in a ratio 1/20 for each year (IPCC, 2003). For this is taken the default value established by the IPCC, 2003.

5.1.5.3 Estimation of the sum of baseline carbon stocks changes

Based on the data provided above for each individual carbon pool, forest carbon stocks for each stratum have been calculated separately using the following equation:

$$C_{BSL,i} = C_{AB_tree,i} + C_{BB_tree,i} + C_{DW,i} + C_{NT,i}$$

Where:

$C_{BSL,i}$	=	Carbon stock in all carbon pools in forest stratum i ; t CO ₂ -e/ha
$C_{AB_tree,i}$	=	Carbon stock in aboveground tree biomass in stratum i ; t CO ₂ -e/ha
$C_{BB_tree,i}$	=	Carbon stock in belowground tree biomass in stratum i ; t CO ₂ -e/ha
$C_{DW,i}$	=	Carbon stock in dead wood in stratum i ; t CO ₂ -e/ha
$C_{NT,i}$	=	Carbon stock in non-tree biomass in stratum i ; t CO ₂ -e/ha

The resulting total carbon stocks for the main forest strata and the post-deforestation strata found in the project and leakage areas and used for estimating carbon stock changes in the following sections can be found in the Table below.

Table 45. Average carbon stocks in tCha-1 for all two forest strata

Strata	Average carbon t C ha ⁻¹													
	C _{AB_tree}		C _{BB_tree}		C _{DW}		C _{LI,i}		C _{nt}		COS		C _{BBnontre}	
	Value	Pool contribution (%)	Value	Pool contribution (%)	Value	Pool contribution (%)	Value	Pool contribution (%)	Value	Pool contribution (%)	Value	Pool contribution (%)	Value	Pool contribution (%)
Forest	108.9	88.5%	2.45	2%*	0.7	0.5%*	2.1	1.7%*	5.44	4.4%	3.25	2.6%	0.2	0.2%
Mangrove Forest	103.5	94%	5.07	5%	1.07	1%*	0.7	0.6%*	0	0%**	0	0%**	0	0%

*Non-significant sink

** Conservatively not included. Sink is not included in the analysis because of continuous changes in the ecosystem dynamics.

Table 46. Average carbon stocks in tCha-1 for non forest

Used non forest	AB tC ha ⁻¹	BB tC ha ⁻¹	COS (tCha-1)	Total (tCha-1)
Grassland *	0	0	0	0
Croplands and pastures	2.91**	0,52	0	2.61
Sand	0	0	0	0
Settlements	0	0	0	0
Water	0	0	0	0

* Accord to AR-Tool14. Carbon stock in trees in the baseline can be accounted as zero if all of the following conditions are met: Land is subjected to periodic cycles (e.g. slash-and-burn, or clearing-regrowing cycles) so that the biomass oscillates between a minimum and a maximum value in the baseline.

** Value obtained of IPCC, 2003.

5.1.5.4 Calculating emission factors

LULC Transition	tCha ⁻¹
Forest to Grassland	114.34
Forest to Croplands and pastures	110.91
Forest to Sand	114.34
Forest to Settlements	114.34
Forest to Water	114.34
Mangrove to Grassland	108.63
Mangrove to Croplands and pastures	105.20
Mangrove to Sand	108.63
Mangrove to Settlements	108.63
Mangrove to Water	108.63

Table 47. Emissions factors for LULC transitions

Baseline emission (BSL-REDD)

Total GHG emissions under the baseline scenario in the project's REDD activity were estimated:

$$\Delta C_{TOT} = \sum_{t=1}^t \sum_{i=1}^M \Delta C_{BSL,i,t}$$

The sinks considered in the estimates are:

Table 48. Sinks considered for estimations.

Pool	Observation
<i>Aboveground</i>	Forest and mangrove
<i>Above Non-tree woody</i>	Only forest
<i>Belowground Non-tree woody</i>	Only forest

$$\Delta C_{BSL,i,t} = A_{unplanned,i,t} * \left(\Delta C_{AB_{tree,i}} - \Delta C_{WP,i} + \Delta C_{AB_{non-tree,i}} + \Delta C_{LI,i} \right) + \left(\sum_{t=10}^t A_{unplanned,i,t} \right) * \left(\Delta C_{BB_{tree,i}} + \Delta C_{AB_{non-tree,i}} + \Delta C_{DW,i} \right) * \left(\frac{1}{10} \right) + \left(\sum_{t=20}^t A_{unplanned,i,t} \right) * \left(C_{WP100,i} + \Delta C_{SOC,i} \right) * \left(\frac{1}{20} \right)$$

Where:

$\Delta C_{BSL,i,t}$	$\Delta C_{BSL,i,t}$	Sum of the baseline carbon stock change in all terrestrial pools in stratum i (forest and mangrove) in year t , tCO ₂ e
$A_{unplanned,i,t}$	$A_{unplanned,i,t}$	Area of unplanned deforestation in forest stratum i in year t ; ha
$C_{WP100,i}$	$C_{WP100,i}$	Carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years from stratum i ; t CO ₂ e ha ⁻¹ .
$\Delta C_{AB,tree,i}$	$\Delta C_{AB,tree,i}$	Baseline carbon stock change in aboveground tree biomass in stratum i ; t CO ₂ e ha ⁻¹
$\Delta C_{AB,non\ tree,i}$	$\Delta C_{AB,non\ tree,i}$	Baseline carbon stock change in aboveground non-tree biomass in stratum i ; t CO ₂ e ha ⁻¹
$\Delta C_{BB,tree,i}$	$\Delta C_{BB,tree,i}$	Baseline carbon stock change in belowground tree biomass in stratum i ; t CO ₂ e ha ⁻¹
$\Delta C_{BB,non\ tree,i}$	$\Delta C_{BB,non\ tree,i}$	Baseline carbon stock change in belowground non-tree biomass in stratum i ; t CO ₂ e ha ⁻¹
$\Delta C_{DW,i}$	$\Delta C_{DW,i}$	Baseline carbon stock change in dead wood in stratum i ; t CO ₂ e ha ⁻¹
$\Delta C_{SOC,i}$	$\Delta C_{SOC,i}$	Baseline carbon stock change in terrestrial soil organic carbon in stratum i ; t CO ₂ e ha ⁻¹

Table 49. Projected annual unplanned deforestation and cumulative deforestation for the PA during the project crediting period and under the baseline scenario.

t	Year	Unplanned deforestation ABSL,PA,unplanned (ha)Forest	Unplanned deforestation ABSL,PA,unplanned (ha) Mangrove	Mature Forest Emissions tCO2	Mangrove Emissions tCO2	Total tCO2
0	2014	226.94	12.10	95.686,44	4.776,24	100.462,69
1	2015	302.59	16.13	127.581,92	6.368,33	133.950,25
2	2016	302.59	16.13	127.581,92	6.368,33	133.950,25
3	2017	302.59	16.13	127.581,92	6.368,33	133.950,25
4	2018	302.59	16.13	127.581,92	6.368,33	133.950,25
5	2019	302.59	16.13	127.581,92	6.368,33	133.950,25
6	2020	302.59	16.13	127.581,92	6.368,33	133.950,25
7	2021	302.59	16.13	127.581,92	6.368,33	133.950,25
8	2022	302.59	16.13	127.581,92	6.368,33	133.950,25
9	2023	302.59	16.13	127.581,92	6.368,33	133.950,25
10	2024	302.59	16.13	127.581,92	6.368,33	133.950,25
11	2025	302.59	16.13	127.581,92	6.368,33	133.950,25
12	2026	302.59	16.13	127.581,92	6.368,33	133.950,25
13	2027	302.59	16.13	127.581,92	6.368,33	133.950,25
14	2028	302.59	16.13	127.581,92	6.368,33	133.950,25
15	2029	302.59	16.13	127.581,92	6.368,33	133.950,25
16	2030	302.59	16.13	127.581,92	6.368,33	133.950,25
17	2031	302.59	16.13	127.581,92	6.368,33	133.950,25
18	2032	302.59	16.13	127.581,92	6.368,33	133.950,25
19	2033	302.59	16.13	127.581,92	6.368,33	133.950,25
20	2034	302.59	16.13	127.581,92	6.368,33	133.950,25
21	2035	302.59	16.13	127.581,92	6.368,33	133.950,25
22	2036	302.59	16.13	127.581,92	6.368,33	133.950,25

23	2037	302.59	16.13	127.581,92	6.368,33	133.950,25
24	2038	302.59	16.13	127.581,92	6.368,33	133.950,25
25	2039	302.59	16.13	127.581,92	6.368,33	133.950,25
26	2040	302.59	16.13	127.581,92	6.368,33	133.950,25
27	2041	302.59	16.13	127.581,92	6.368,33	133.950,25
28	2042	302.59	16.13	127.581,92	6.368,33	133.950,25
29	2043	302.59	16.13	127.581,92	6.368,33	133.950,25
30	2044	75.65	4.03	31.895,48	1.592,08	33.487,56

5.1.6 Uncertainty

Module VMD0017-X-UNC v2.2 describes the procedure to estimate Uncertainty in REDD baseline estimates. The first step consists of: Step 1: Evaluate the uncertainty in the projection of the reference rate of deforestation or degradation, for unplanned deforestation and degradation, which was estimated according to the guidelines of the BL-UP module

According to the BL-UP module, in step 2.2 Estimation of the annual areas of unplanned deforestation in the baseline, the modeled annual area of deforestation in DRR ($A_{BSL,RR,unplanned}$) should be calculated along of the historical reference period. For this, the methodology suggests three approaches: historical average, linear regression and non-linear regression. For the Los Riscales REDD project, the selected approach is the historical average annual deforestation during the historical reference period⁴⁹.

Step 1 of module VMD0017-X-UNC v2.2 (5.1.1 Step 1: Assess Uncertainty in Projection of Baseline Rate of Deforestation or Degradation) mentions that it is assumed that there is zero uncertainty in the reference rate of deforestation or degradation when the figures are equal to a long-term average (BL-UP), considering the average reference

⁴⁹ According to the BL-UP module, to be applied, any regression must be significant ($p \leq 0.05$), must have an $r^2 \geq 0.75$ and must be free of bias (demonstrated through the selection of the fit with the lowest residuals). Considering the spatial information available for DRR in the historical reference period (2002-2014), we sought to apply a linear regression. However, linear regression is not applicable, since the average annual deforestation in the DRR is calculated only for the intervals 2002-2007 and 2007-2014. As we did not have more data to estimate a linear regression, approach 1 (historical deforestation rate during the historical reference period) was selected as an approximation to define the deforestation baseline.

rate was calculated for the historical reference period, then $\overline{Uncertainty_{BSL,RATE}} = 0$

For the Assess Uncertainty of Emissions and Removals in Project Area in Baseline Scenario, national data on aerial biomass contents were used and considering that the module mentions that when an uncertainty value is not known, the project must justify that it is using an indisputably number conservative and an uncertainty of 0% can be used.

Taking into account the above, the data associated with the aerial biomass contents, used for the estimates, were obtained from information from official national sources, therefore the project accepts the observations derived from the use of this information, following good practices for its adoption. The results obtained in the technical contributions document of the Forest and Carbon Monitoring System (2014) used by the project, for the different types of forest and for the forest at a national scale, highlight the goodness of using the weights to estimate aerial biomass and emissions, since it leads to a decrease in uncertainty. However, when comparing the two approaches, the inverse of the variance is a method that generates much more conservative estimates, since it gives greater weight and credibility to the data sets.

It is important to mention that national sources comply with the requirements set out by the UNFCCC, in which their construction is carried out using a step-by-step approach, where data with the least associated uncertainty is incorporated, since said information meets the requirements of UNFCCC, therefore the project makes use of this information.

5.2 Project Emissions

According to methodological tool VDM0015, the emission balances with the implementation of the Project are defined by equation 1 of the tool.

$$\Delta C_{WPS-REDD} = \sum_{t=1}^{t^*} \sum_{i=1}^M (\Delta C_{P,DefPA,i,t} + \Delta C_{P,Deg,i,t} + \Delta C_{P,DistPA,i,t} + GHG_{P-E,i,t} - \Delta C_{P,Enh,i,t}) \quad (1)$$

For reduction goals with Project, in the Section 3.4.1.2 identified the main drivers of deforestation. In terms of participation, the main drivers are the conversion of forests into areas for subsistence crops, settlement, livestock farming and the adaptation of areas for infrastructure for tourism, which together account for 75% of deforestation. This is followed by the harvesting of firewood for domestic use, which accounts for 8% of deforestation. These five elements together account for 83% of deforestation in the project area.

Accordingly, the project scenario for the first five years aims to address these main drivers of deforestation in the area through actions such as governance, which includes updating ethno-development plans to include lines of action for climate change mitigation, i.e. proper planning of the

area based on concepts such as where to live, where to produce and where to conserve. These adjustments to the ethno-development plan within the framework of local governance will make it possible to establish conservation agreements, create productive alternatives for the economic income of the population and improve food security (see section 1.11, Project Activities).

In the short term, there is support from international cooperation and other national sources, but alternative income, such as the environmental service associated with carbon, is needed for long-term financial sustainability. It should be noted that the early stages supported by cooperation are critical to achieving the deforestation reduction target, which is estimated to be 70% in the first five years after the main drivers have been effectively addressed, and that as income from the sale of carbon credits is generated and community confidence and governance is strengthened, the commitment to reduce deforestation will increase by up to 80% after year 5. It should be clarified that the project does not intend to achieve a total reduction in deforestation through the adoption of activities, as communities culturally require wood for the construction, adaptation and maintenance of infrastructure (houses) and the construction of boats for community mobility.

The parameters considered in the estimates for the Project proposal are:

ΔC_p = Net greenhouse gas emissions within the project area under the project scenario; t

$CO_2e\Delta C_{P,DefPA,i,t}$ = Net carbon stock change as a result of deforestation in the project area in the project case in stratum i at time t; t CO₂e.

$\Delta C_{P,Deg,i,t}$ = Net carbon stock change as a result of degradation in the project area in the project case in stratum I at time t; t CO₂e. For the Project proposal it is assumed as zero (o)

$\Delta C_{P,DisPA,i,t}$ = Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i at time t; t. For the Project proposal it is assumed as zero (o). No significant natural disturbance processes leading to GHG generation are identified for the project region.

$GHG_{P-E,i,t}$ = Net carbon stock change as a result of natural disturbance in the project area in the project

$\Delta C_{P,Enh,i,t}$ = Net carbon stock change due to forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum i at time t; t CO₂e. For the Project proposal, it is assumed as zero (o). Conservative to exclude.

According to the efficiency of implementation, the estimations are as follows:

$$A_{PS,PA,unplanned,t} = A_{BSL,PA,unplanned,t} * (1 - EI)$$

Where:

$A_{PS,PA,unplanned,t}$	Unplanned deforestation area projected for the PA under the project scenario in the year t ; ha
$A_{BSL,PA,unplanned,t}$	Unplanned deforestation area projected for the PA under the baseline scenario in the year t ; ha
EI	Efficiency index in the reduction of deforestation proposed in the REDD project, dimensionless.
t	1, 2, 3, ... t * years from the start date of the REDD project activity

Section 3.4.1.2 identified the main drivers of deforestation. In terms of participation, the main drivers are the conversion of forests into areas for subsistence crops, settlement, livestock farming and the adaptation of areas for infrastructure for tourism, which together account for 75% of deforestation. This is followed by the harvesting of firewood for domestic use, which accounts for 8% of deforestation. These five elements together account for 83% of deforestation in the project area.

Accordingly, the project scenario for the first five years aims to address these main drivers of deforestation in the area through actions such as governance, which includes updating ethno-development plans to include lines of action for climate change mitigation, i.e. proper planning of the area based on concepts such as where to live, where to produce and where to conserve. These adjustments to the ethno-development plan within the framework of local governance will make it possible to establish conservation agreements, create productive alternatives for the economic income of the population and improve food security (see section 1.11, Project Activities).

In the short term, there is support from international cooperation and other national sources, but alternative income, such as the environmental service associated with carbon, is needed for long-term financial sustainability. It should be noted that the early stages supported by cooperation are critical to achieving the deforestation reduction target, which is estimated to be 70% in the first five years after the main drivers have been effectively addressed, and that as income from the sale of carbon credits is generated and community confidence and governance is strengthened, the commitment to reduce deforestation will increase by up to 80% after year 5. It should be clarified that the project does not intend to achieve a total reduction in deforestation through the adoption of activities, as communities culturally require wood for the construction, adaptation and maintenance of infrastructure (houses) and the construction of boats for community mobility.

5.2.1 Net Emissions for unplanned deforestation

$$\Delta C_{BSL,REDD} = \Delta C_{BSL,unplanned}$$

Where:

$\Delta C_{BSL,unplanned}$ Net GHG emissions in the baseline scenario from unplanned deforestation up to year t^* (t CO₂e)

$$\Delta C_{BSL,unplanned} = \Delta C_{BSL,PA,unplanned} + GHG_{BSL,E}$$

Where:

$\Delta C_{BSL,unplanned}$ Net greenhouse gas emissions in the baseline from unplanned deforestation up to year t^* ; t CO₂e

$\Delta C_{BSL,PA,unplanned}$ Net CO₂ emissions in the baseline from unplanned deforestation in the project area up to year t^* ; t CO₂e

$GHG_{BSL,E}$ Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline up to year t^* ; t CO₂e

GHG emissions will be zero because the Project will not use fertilizers as a leakage prevention activity. Therefore, emissions from nitrous oxide are excluded, and emission from fossil fuel combustion is ignored in the baseline and, there for can be ignored in the project case⁵⁰.

Emissions from firewood consumption are less than 0.6%, which is considered insignificant compared to the net anthropogenic removals derived from the implementation of the project.

It is expected that for the project scenario with Project, an effectiveness in reducing deforestation of 70% in the first five years of the project and 80% from year 6 to 30 is proposed.

Table 50. Summary of net Emissions for unplanned deforestation

⁵⁰ VMD0014, E-FFC: "Fossil fuel combustion in all situations is an optional emission source."

With project						
t	Cumulative avoided deforestation ABSL,PA,unplanned (ha) Forest	Cumulative avoided deforestation ABSL,PA,unplanned (tCO2eq) Forest	Cumulative avoided deforestation ABSL,PA,unplanned (ha) Mangrove	Cumulative avoided deforestation ABSL,PA,unplanned (tCO2eq) Mangrove	Total Cumulative avoided deforestation ABSL,PA,unplanned (ha)	Total Cumulative avoided deforestation ABSL,PA,unplanned (tCO2eq)
0	68	28.706	4	1,433	72	30.139
1	159	66.981	8	3,343	167	70.324
2	250	105.255	13	5,254	263	110.509
3	340	143.530	18	7,164	359	150.694
4	431	181.804	23	9,075	454	190.879
5	522	220.079	28	10,985	550	231.064
6	613	258.353	33	12,896	645	271.249
7	673	283.870	36	14,170	709	298.039
8	734	309.386	39	15,443	773	324.829
9	794	334.903	42	16,717	837	351.619
10	855	360.419	46	17,991	900	378.409
11	915	385.935	49	19,264	964	405.200
12	976	411.452	52	20,538	1,028	431.990
13	1,036	436.968	55	21,812	1,092	458.780
14	1,097	462.484	58	23,085	1,155	485.570
15	1,157	488.001	62	24,359	1,219	512.360
16	1,218	513.517	65	25,633	1,283	539.150
17	1,278	539.034	68	26,906	1,347	565.940

18	1,339	564.550	71	28,180	1,410	592.730
19	1,399	590.066	75	29,454	1,474	619.520
20	1,460	615.583	78	30,727	1,538	646.310
21	1,521	641.099	81	32,001	1,602	673.100
22	1,581	666.616	84	33,274	1,665	699.890
23	1,642	692.132	88	34,548	1,729	726.680
24	1,702	717.648	91	35,822	1,793	753.470
25	1,763	743.165	94	37,095	1,857	780.260
26	1,823	768.681	97	38,369	1,920	807.050
27	1,884	794.197	100	39,643	1,984	833.840
28	1,944	819.714	104	40,916	2,048	860.630
29	2,005	845.230	107	42,190	2,112	887.420
30	2,020	851.609	108	42,509	2,127	894.118

5.3 Leakage

According to the VMD007 methodology, the leakage belt is defined as: an area or areas of land around or adjacent to the project area in which the activities of the baseline could be displaced due to the activities implemented in the project area.

To establish the leakage belt, the BL-UP module (emissions from unplanned deforestation) was applied, therefore the module "Estimation of emissions from displacement of activities due to unplanned avoided deforestation LK-ASU" is also applied. The leakage belt corresponds to a forest area located next to the project area,

whose size meets the criteria for an area of at least 90% of the project area. According to the BL-UP module, the following criteria were evaluated (Table 51):

Table 51. Similarity criteria between Leakage belt and Project Area

Category	Variable	Comparison
The leakage belt area must be the forest areas closest to the project area meeting the minimum area requirement, listed below, and meeting the criteria listed here	Forest Area	The leakage belt corresponds to a forest area of 25,744.95 ha at the start of the project, located next to the project area, whose size meets the area criterion of at least 90% of the project area.
All parts of the leakage belt must, at a minimum, be accessible and reachable by project baseline deforestation agents with consideration of agent mobility	Accessibility	The identified agents take advantage of the forest resources located near the bed of the Panguí, Nuquí, Cugucho, Chorí and Jurubidó rivers, they mobilize the wood using the current downstream of each of the aforementioned bodies of water, this method of transporting the wood is known locally as “balseo”.
Landscape factors	Forest types	The types of forests identified in the leakage belt are the same type of forests in the project area, corresponding to very humid tropical forests, present throughout the Colombian Pacific.
	Soil types	The main type of soil, both in the project area and in the leak belt, are Cambisols, originated from old and residual alluvial sediments, with moderately fine materials and are located in Medium Terraces with moderate drainage, as well as in hills, distributed in the aforementioned areas. The main soil units identified, both for the project area and for the leak belt were typic dystrodepts, Oxic dystrodepts and Humic dystrodepts.
	slope classes	Slope classes represented as a similar ratio between gentle slope (<15%) and steep slope (>15% and <20%) same that project. See Annex 38
	Elevation classes	A comparison of contour data produced at a scale of 1: 100000 for Colombia by the Geographic Institute Augustin Codazzi was conducted for the leakage belt and project area. This elevation information indicates that the reference area and the project area are both

		between 0 - 830 m of elevation (+/-20%) See Annex 38.
Transportation Networks and human infrastructure	Navigable Rivers	The rivers, both in the project area and in the reference region, are not wide enough for the navigation of large vessels, but they do allow the movement of wood by floating. See Annex 38.
	Road density	Road density (m/km ²) at the start of reference period for project area and Leakage is similar (+/-20%). See Annex 38.
	Settlement density	Settlements/km ² is the same (+/-20%) for non-forested areas in a 1 km buffer around the project area and leakage belt. See Annex 38.
Social factors	Social factors	Although the leakage belt is located within indigenous reservation areas, deforestation is conditioned by the ease offered by the channels that cross the project area and that also cross the reservations to mobilize the wood. Although the cultural practices and the ethnic composition of the populations are different, the forest-clearing practices are similar.
Policies and Regulations	Policies and Regulations	Both the project area and the leakage belt are located within collective territories but belong to different ethnic groups although their policies and regulations are different, it is important to highlight that these collective territories, both Afro and indigenous, share the vocation of conservation of the natural resources found within their territories and that is part of the biogeographical Chocó.
Exclusion of planned deforestation	Exclusion of planned deforestation	Planned deforestation areas are excluded in both Leakage Belt and project area

5.3.1 Ex-ante Estimating Emissions from Leakage

Ex-ante leakage estimation was undertaken according to VM0007 tool VMD0010 Estimation of emissions from activity shifting for avoiding unplanned deforestation (LK-ASU), which determines that

a conservative estimate must be produced to reflect potential GHG emissions in the leakage belt as a result of displaced deforestation agents.

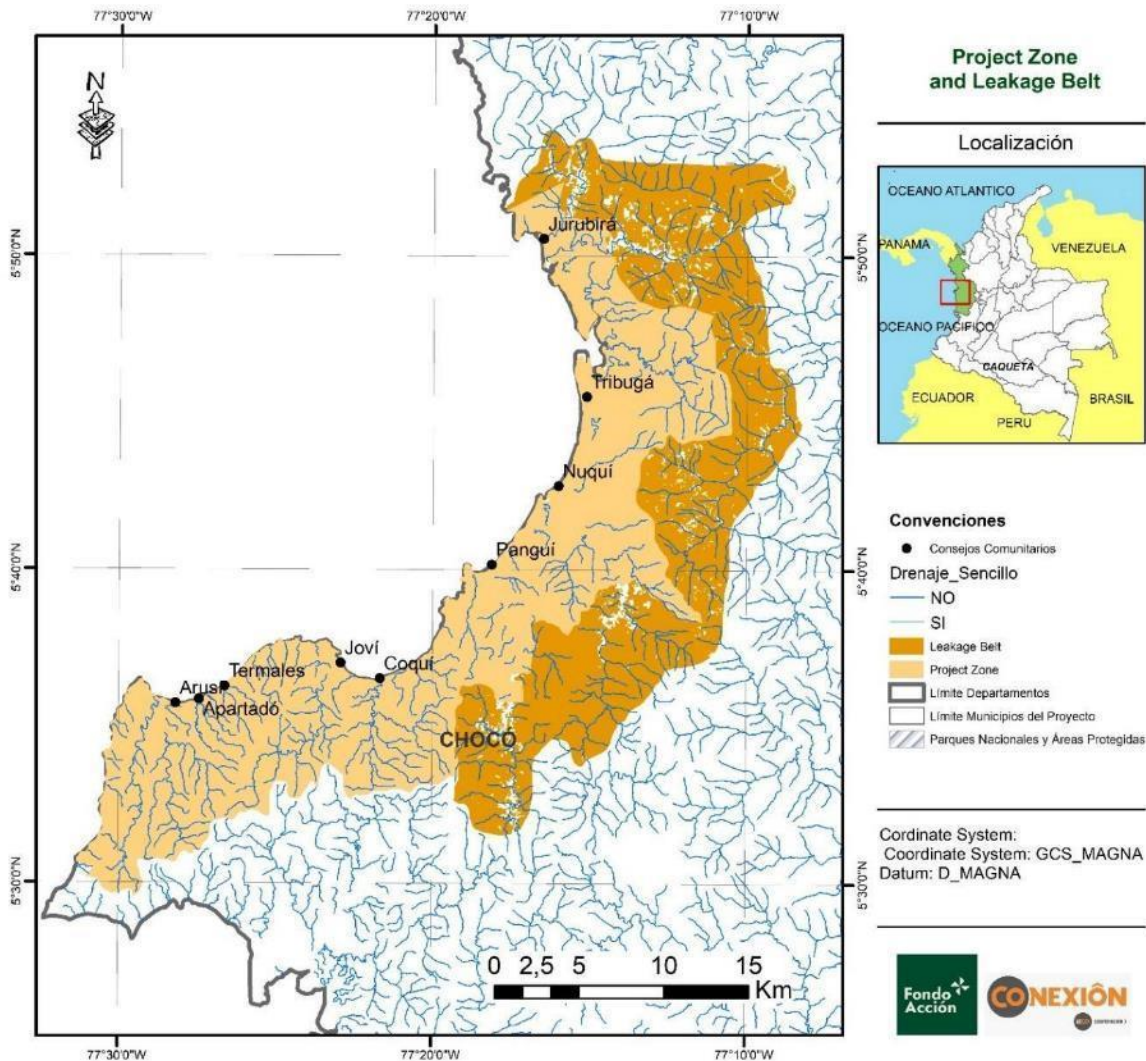


Figure 25. Leakage Belt

According with BL-UP module, when is not performed spatial modelling the estimation of annual area of unplanned baseline deforestation in the leakage belt is estimated as follows:

$$A_{BSL, LB, unplanned, t} = A_{BSL, RRD, unplanned, t} * P_{LK}$$

Where

$A_{BSL, LB, unplanned, t}$ $A_{BSL, LB, unplanned, t}$ Projected area of unplanned baseline deforestation in the leakage belt area in year t ; ha

$A_{BSL, RRD, unplanned, t}$ $A_{BSL, RRD, unplanned, t}$ Projected area of unplanned baseline deforestation in RRD in year t ; ha

P_{LK} P_{LK} Ratio of the area of the leakage belt to the total area of RRD; dimensionless

t 1, 2, 3, ... t* years elapsed since the projected start of the project activity

$$A_{BSL, LB, unplanned} = \sum_{t=1}^{t^*} A_{BSL, LB, unplanned, t}$$

Where.

$A_{BSL, LB, unplanned}$ Total area of unplanned baseline deforestation in the leakage belt; ha

$A_{BSL, LB, unplanned, t}$ Projected area of unplanned baseline deforestation in the leakage belt in year t; ha

t 1, 2, 3, ... t* years elapsed since the projected start of the project activity.

Table 52. Projected annual unplanned deforestation and accumulated deforestation for the LK during the project's accreditation period.

Project year	Calendar year	ABSL, PLK, unplanned, t (ha) forest	ABSL, PLK, unplanned, t (ha) MANGROVE
0	2014	209.64	11.18
1	2015	279.52	14.90
2	2016	279.52	14.90
3	2017	279.52	14.90
4	2018	279.52	14.90
5	2019	279.52	14.90
6	2020	279.52	14.90
7	2021	279.52	14.90
8	2022	279.52	14.90
9	2023	279.52	14.90
10	2024	279.52	14.90
11	2025	279.52	14.90
12	2026	279.52	14.90
13	2027	279.52	14.90
14	2028	279.52	14.90
15	2029	279.52	14.90
16	2030	279.52	14.90
17	2031	279.52	14.90
18	2032	279.52	14.90
19	2033	279.52	14.90
20	2034	279.52	14.90
21	2035	279.52	14.90
22	2036	279.52	14.90
23	2037	279.52	14.90
24	2038	279.52	14.90
25	2039	279.52	14.90
26	2040	279.52	14.90
27	2041	279.52	14.90
28	2042	279.52	14.90
29	2043	279.52	14.90
30	2044	69.88	3.73

The project proposal will promote actions to prevent the displacement of deforestation in areas outside the project area. The leakage belt was defined, and according to VCS-Standard-v4.3 section 3.14.13 (1), because no estimates were developed for leakage from wood markets because it has not been classified as one of the drivers of deforestation, a default value of 15% deduction for leakage is established.

$$\Delta C_{LK-REDD} = \Delta C_{LK-AS,unplanned}$$

Where:

$\Delta C_{LK-AS,unplanned}$ Net GHG emissions due to activity shifting leakage for projects preventing unplanned deforestation up to year t^* (t CO₂e).

Table 53. Estimation of emissions in the leakage belt.

Project year	Calendar year	LK-AS, unplanned (tCO ₂)	Total Cumulative unplanned deforestation LK-AS,unplanned (tCO ₂)
0	2014	13.920	13.920
1	2015	18.565	32.485
2	2016	18.562	51.047
3	2017	18.560	69.608
4	2018	18.558	88.166
5	2019	18.556	106.722
6	2020	18.554	125.276
7	2021	18.552	143.827
8	2022	18.549	162.377
9	2023	18.547	180.924
10	2024	18.545	199.469
11	2025	18.543	218.012
12	2026	18.541	236.553
13	2027	18.539	255.092
14	2028	18.536	273.628
15	2029	18.534	292.162
16	2030	18.532	310.694
17	2031	18.530	329.224
18	2032	18.528	347.752
19	2033	18.526	366.278
20	2034	18.523	384.801
21	2035	18.521	403.322
22	2036	18.519	421.842
23	2037	18.517	440.359
24	2038	18.515	458.873
25	2039	18.513	477.386

26	2040	18.510	495.896
27	2041	18.508	514.405
28	2042	18.506	532.911
29	2043	18.504	551.415
30	2044	4.577	555.992

5.3.2 Estimation of Unplanned Deforestation Displaced from the Project Area to Outside the Leakage Belt

Ex-ante leakage estimation from Unplanned Deforestation Displaced from the Project Area to Outside the Leakage Belt, were calculated according to module VMD0010 Estimation of emissions from activity shifting for avoiding unplanned deforestation (LK-ASU)

The leakage due to the proportion of the baseline deforestation actors who are displaced to areas outside the leakage belt would therefore be equal to the change in stocks in the leakage belt the baseline scenario minus the change in stocks in the leakage belt in the project scenario multiplied by the proportional leakage factor for areas with immigrating populations:

$$\Delta C_{LK-ASU,OLB} = (\Delta C_{BSL,LK,unplanned} - \Delta C_{P,LB}) * LK_{PROP}$$

Where:

$\Delta C_{LK-ASU,OLB}$ Net CO2 emissions due to unplanned deforestation displaced outside the leakage belt up to year t* (t CO2e)

$\Delta C_{BSL,LK,unplanned}$ Net CO2 equivalent emissions in the baseline from unplanned deforestation in the leakage belt up to year t* (t CO2e)

$\Delta C_{P,LB}$ Net CO2 equivalent emissions within the leakage belt in the project case up to year t* (t CO2e)

LK_{PROP} Proportional leakage for areas with immigrating populations (proportion)

Table 1. Net projected CO₂ emissions due to unplanned deforestation displaced outside the leakage belt

	Year	(t CO ₂ e)
ΔCLK,ASU,O LB	2014	622,60
	2015	830,32
	2016	830,22
	2017	830,13
	2018	830,03
	2019	829,93
	2020	829,84
	2021	829,74
	2022	829,64
	2023	829,55
	2024	829,45
	2025	829,35
	2026	829,25
	2027	829,16
	2028	829,06
	2029	828,96
	2030	828,87
	2031	828,77
	2032	828,67
	2033	828,58
	2034	828,48
	2035	828,38
	2036	828,29
	2037	828,19
	2038	828,09
	2039	827,99
	2040	827,90
	2041	827,80
	2042	827,70
	2043	827,61
	2044	204,71

5.4 Estimated Net GHG Emission Reductions and Removals

Estimates of the project's net emission reductions are calculated using:

$$NER_{REDD} = \Delta C_{BSL,REDD} - \Delta_{LK-REDD}$$

Where:

NER_{REDD}
 (tCO₂e)

Total net GHG emission reductions of the REDD project activity up to year t*

$\Delta C_{BSL, REDD}$	$\Delta C_{BSL, REDD}$	Net GHG emissions in the REDD baseline scenario up to year t^* (t CO ₂ e)
$\Delta LK-REDD$	$\Delta LK-REDD$	Net GHG emissions due to leakage from the REDD project activity up to year t^* (t CO ₂ e)

Table 54. Estimated Emission Reductions and Removals

Years	$\Delta C_{BSL, \text{unplanned}}$	Total avoided deforestation $ABS_{L,PA,unplanned}$ (tCO ₂ eq)	$\Delta CW_{PS-REDD}$ (tCO ₂)	$\Delta C_{LK-REDD}$ (tCO ₂)	NER_{REDD} (tCO ₂)
2014	70.324	30.139	0.0	622,6	69.701
2015	93.765	40.185	1.2	830,3	92.936
2016	93.765	40.185	1.2	830,2	92.936
2017	93.765	40.185	1.2	830,1	92.936
2018	93.765	40.185	1.2	830,0	92.936
2019	93.765	40.185	1.2	829,9	92.936
2020	93.765	40.185	1.2	829,8	92.937
2021	107.160	26.790	1.2	829,7	106.332
2022	107.160	26.790	1.2	829,6	106.332
2023	107.160	26.790	1.2	829,5	106.332
2024	107.160	26.790	1.2	829,4	106.332
2025	107.160	26.790	1.2	829,4	106.332
2026	107.160	26.790	1.2	829,3	106.332
2027	107.160	26.790	1.2	829,2	106.332
2028	107.160	26.790	1.2	829,1	106.332
2029	107.160	26.790	1.2	829,0	106.332
2030	107.160	26.790	1.2	828,9	106.333
2031	107.160	26.790	1.2	828,8	106.333
2032	107.160	26.790	1.2	828,7	106.333
2033	107.160	26.790	1.2	828,6	106.333
2034	107.160	26.790	1.2	828,5	106.333
2035	107.160	26.790	1.2	828,4	106.333
2036	107.160	26.790	1.2	828,3	106.333
2037	107.160	26.790	1.2	828,2	106.333
2038	107.160	26.790	1.2	828,1	106.333
2039	107.160	26.790	1.2	828,0	106.333

2040	107.160	26.790	1.2	827,9	106.334
2041	107.160	26.790	1.2	827,8	106.334
2042	107.160	26.790	1.2	827,7	106.334
2043	107.160	26.790	1.2	827,6	106.334
2044	26.790	6.698	1.2	204,7	26.587
Total	3.124.390	894.118	37	24.867	3.099.560

5.4.1 Estimated of expected Verified Units

The overall risk rating for the project was prepared under the VCS AFOLU Non-Permanence Risk Assessment Tool (VCS Version 4.0), which is summarized in Table 55 and has been provided separately in Annex Risk analysis.

Table 55. Risk Calculation

Risk Category	Rating
a) Internal Risk	9
b) External Risk	0
c) Natural Risk	3
Overall Risk Rating (a + b + c)	12*

*Overall risk rating cannot be below 10.

$$Buffer_{Unplanned} = \left(\frac{\left(\Delta C_{BSL, Unplanned} - \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{FC, i, t} + N_2 O_{direct, i, t}) \right) - \left(\Delta C_{P, Unplanned} - \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{FC, i, t} + N_2 O_{direct, i, t}) \right)}{P_{Unplanned}} \right) \times Buffer \% \quad (15)$$

Table 56. VCU, projection with the implementation of the project. Estimation for 30 years of implementation.

Year	$\Delta C_{BSL-REDD}$ (tCO ₂)	$\Delta C_{WPS-REDD}$ (tCO ₂)	$\Delta C_{LK-REDD}$ (tCO ₂)	NER_{REDD} (tCO ₂)	Buffer (12%)	Expected VCU's accumulate
2014	69.701	0.0	622,6	69.701	8.439	61.262,4
2015	92.936	1.2	830,3	92.936	11.252	81.684,3
2016	92.936	1.2	830,2	92.936	11.252	81.684,4
2017	92.936	1.2	830,1	92.936	11.252	81.684,5
2018	92.936	1.2	830,0	92.936	11.252	81.684,6
2019	92.936	1.2	829,9	92.936	11.252	81.684,7
2020	92.937	1.2	829,8	92.937	11.252	81.684,8
2021	106.332	1.2	829,7	106.332	12.859	93.472,5
2022	106.332	1.2	829,6	106.332	12.859	93.472,6
2023	106.332	1.2	829,5	106.332	12.859	93.472,7
2024	106.332	1.2	829,4	106.332	12.859	93.472,8
2025	106.332	1.2	829,4	106.332	12.859	93.472,9
2026	106.332	1.2	829,3	106.332	12.859	93.473,0
2027	106.332	1.2	829,2	106.332	12.859	93.473,1
2028	106.332	1.2	829,1	106.332	12.859	93.473,2
2029	106.332	1.2	829,0	106.332	12.859	93.473,3
2030	106.333	1.2	828,9	106.333	12.859	93.473,4
2031	106.333	1.2	828,8	106.333	12.859	93.473,5
2032	106.333	1.2	828,7	106.333	12.859	93.473,6
2033	106.333	1.2	828,6	106.333	12.859	93.473,6
2034	106.333	1.2	828,5	106.333	12.859	93.473,7
2035	106.333	1.2	828,4	106.333	12.859	93.473,8
2036	106.333	1.2	828,3	106.333	12.859	93.473,9
2037	106.333	1.2	828,2	106.333	12.859	93.474,0

2038	106.333	1.2	828,1	106.333	12.859	93.474,1
2039	106.333	1.2	828,0	106.333	12.859	93.474,2
2040	106.334	1.2	827,9	106.334	12.859	93.474,3
2041	106.334	1.2	827,8	106.334	12.859	93.474,4
2042	106.334	1.2	827,7	106.334	12.859	93.474,5
2043	106.334	1.2	827,6	106.334	12.859	93.474,6
2044	26.587	1.2	204,7	26.587	3.215	23.371,8
Total	3.099.560	37	24.867	3.099.560	374.927	2.724.632,99

6 MONITORING

The following is the first monitoring report of the “RISCALES REDD PROJECT”, corresponding to the period from April 1, 2014 to December 31, 2020. For the purposes of this document, the monitoring period 2014-2020 will be understood as the interval from April 01, 2014 to December 31, 2020.

During the first stage of implementation of the GHG project, activities related to the programs Strengthening the Organizational Process, Governance and Peace Building, as well as Ecosystems and Use Spaces, were developed between 2014 and 2020 with the objective of strengthening the capacities of the communities of the Los Riscales Community Council. These activities focused on issues related to forests, climate, equitable benefit sharing, social and environmental safeguards for REDD+, among others. The purpose was to promote the active participation of the communities in decision-making and training programs.

The project ensures ongoing and periodic training for all team members to keep them up to date on best monitoring practices and techniques. This process will be reviewed regularly to ensure that all members, both current and future, have access to the information necessary to effectively carry out monitoring activities.

To socialize the monitoring results with local government and the community, community meetings, participatory workshops, and printed and digital newsletters will be conducted. In addition, accessible and visual summaries will be prepared to facilitate the understanding of the data among community members and local governors. Visual tools and appropriate language will be used so that the entire community can understand the results. This will allow for better integration and understanding of the impact of REDD+ project activities in the territory.

After each presentation of results, spaces will be opened to receive feedback from the community through surveys and focus group discussions. Comments and suggestions will be considered to improve monitoring procedures and adapt project activities to local needs.

Work was carried out to create and consolidate governance structures that would allow communities to have a voice and vote in matters that have an impact on their well-being and development. This effort was complemented with ten (10) modules associated with capacity building for the communities of the Los Riscales Community Council on forests and climates for REDD+ in Colombia. The results of these initiatives are reflected in documents such as Annex 5. Sembrar y cosechar lena. Manual para el establecimiento de huertos leñeros, Annex 44. Corredor conservación del Golfo de

Tribugá, and Annex 45. Planting report for the community recovery of mangroves as a strategy to increase carbon reserves.



Figure 26. Photographic record of the development of the 10 capacity-building modules of the communities of the Los Riscasles Community Council, on forests and climates for REDD+ in Colombia.

In addition, the agreements reached with the community are detailed in relation to the sites identified for the management and enrichment of vanilla plantations, as well as the mechanisms to support conservation and governance in the collective territory. These efforts are aimed at increasing carbon stocks, in accordance with the

participatory processes carried out by the community to consolidate a REDD+ initiative in the collective territory of the Afro Colombian communities of Nuquí.

Regarding the activities of the other programs planned for Phase 2 (2020-2023), preliminary studies are currently underway, as well as the planning and budgets necessary for their implementation. These activities will be initiated according to the prioritization agreed in assembly with the authorities of the Community Council, who, taking into account their needs, will define the order of implementation.

Recognizing the importance of reducing practices that threaten the forests and the environment in the project area, the members of the Riscales Community Council, led by their leaders and traditional authorities, and with the support of public and private entities, developed between 01/04/2014 and 31/12/2020 various activities aimed at reducing deforestation and forest degradation in the territory, as well as improving the lives of the families living there. In addition, each activity was framed within one of the eight lines of action of the REDD project.

Data / Parameter	Regional Forest Cover / Non-Forest Cover Benchmark Map
Data unit	Ha
Description	Map that shows the stratification and location of forest and non-forest areas in the Reference Region RRD at the beginning of the accreditation (Map of spatial limits).
Source of data	Landsat satellite images
Value applied:	Remote sensing
Justification of choice of data or description of measurement methods and procedures applied	Landsat images have adequate spatial resolution corresponding to 30 meters and appropriate scale. Also, this information is freely available to the public.
Purpose of Data	The images were used for all the purposed listed below: • Determination of baseline scenario • Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage

Comments	Non-applicable
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6.1 Data and Parameters Available at Validation

Data / Parameter	Project Forest Cover Benchmark Map
Data unit	ha
Description	Map showing the stratification and location of forest within the project area at the beginning of each monitoring period. The benchmark map will show the deforested areas at each monitoring event (Map of spatial limits)
Source of data	Landsat satellite images
Value applied:	Remote sensing
Justification of choice of data or description of measurement methods and procedures applied	Landsat images have adequate spatial resolution corresponding to 30 meters and appropriate scale. Also, this information is freely available to the public.
Purpose of Data	The project area forest benchmark map for year 2014 (project start date) is used to: • Determination of baseline scenario • Calculation of baseline emissions • Calculation of project emissions
Comments	Non-applicable

Data / Parameter	Leakage Belt Forest Cover Benchmark Map
Data unit	ha
Description	Map showing the location of forest within the leakage belt at the beginning of each monitoring period. The benchmark map will show the deforested areas at each monitoring event
Source of data	Landsat satellite images
Value applied:	Remote sensing
Justification of choice of data or description of measurement methods and procedures applied	Landsat images have adequate spatial resolution corresponding to 30 meters and appropriate scale. Also, this information is freely available to the public.
Purpose of Data	The leakage belt forest cover benchmark map is used to: • Calculation of baseline emissions • Calculation of leakage belt emissions
Comments	Non-applicable

Data / Parameter	PA
Data unit	ha
Description	Project area
Source of data	Landsat images and Forest and Non-Forest Map For Forest and Mangrove
Value applied:	27,870.04
Justification of choice of data or description of measurement methods and procedures applied	Landsat images have adequate spatial resolution corresponding to 30 meters and appropriate scale. Also, this information is freely available to the public.
Purpose of Data	The forest strata were used to: • Determine baseline scenario. • Calculate baseline emissions. • Calculate project emissions
Comments	Ex-ante it is assumed that strata area will remain constant

Data / Parameter	RRD
Data unit	ha
Description	Area of the reference region for projecting deforestation
Source of data	Landsat images and Forest and Non-Forest Map For Forest and Mangrove
Value applied:	162,313.67
Justification of choice of data or description of measurement methods and procedures applied	Reference region for projecting deforestation (RRD) for description of measurement methods and procedures applied
Purpose of Data	The forest strata were used to: • Determine baseline scenario. • Calculate baseline emissions. • Calculate project emissions
Comments	N.A

Data / Parameter	Thrp
Data unit	Year
Description	Duration of the historical reference period
Source of data	Landsat images and Forest and Non-Forest Map 2002 - 2014
Value applied:	12 years
Justification of choice of data or description of measurement methods and procedures applied	Projection of deforestation under the historical approach, the reference period corresponds to the years elapsed between three spatial data points. The selected historical reference period was 2002-2007-2014 (12 years into the past with respect to the project start date).

Purpose of Data	The forest strata were used to: • Determine baseline scenario • Calculate baseline emissions • Calculate project emissions
Comments	N.A

Data / Parameter	$A_{BSL,RRD,unplanned,t}$
Data unit	Hectares per year (ha/year)
Description	Estimated annual deforestation in the reference region during the historical reference period
Source of data	Landsat images and Forest and Non Forest Map 2002 - 2014
Value applied:	1,762.3 ha/year
Justification of choice of data or description of measurement methods and procedures applied	% annual deforestation
Purpose of Data	Project baseline emissions.
Comments	Deforestation 2002-2007: median annual deforestation 1,894.7ha Year⁻¹ 2007-2014: median annual deforestation <u>1,629.9ha</u> Year⁻¹ Average: 1,762.3 ha Year⁻¹

Data / Parameter	P_{PA}
Data unit	Dimensionless
Description	Ratio of project area to total RRD area
Source of data	Landsat images and Forest and Non Forest Map 2002 - 2014
Value applied:	0.1717
Justification of choice of data or description of measurement methods and procedures applied	Estimate the projection of deforestation in AP.
Purpose of Data	• Determining the Baseline Scenario.

Comments	N.A
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Data / Parameter	$A_{BSL,PA,unplanned,t}$
Data unit	Hectares per year (ha/year)
Description	Projected area of unplanned deforestation in the project area in year t
Source of data	Landsat images and Forest and Non Forest Map 2002 – 2014 Base Line, and national NREF.
Value applied:	267.8 ha/year
Justification of choice of data or description of measurement methods and procedures applied	% annual deforestation
Purpose of Data	Projected area of unplanned deforestation in the project area in year t
Comments	N.A

Data / Parameter	$ABSL,i,t$
Data unit	Ha.
Description	Area of stratum i in year t under baseline scenario
Source of data	Landsat images and Forest and Non Forest Map 2014
Value applied:	Forest: 25855.41 ha Mangrove: 2014.63 ha
Justification of choice of data or description of measurement methods and procedures applied	Accor to X-STR
Purpose of Data	Estimation of baseline emissions Estimation of project emissions
Comments	N.A

Data / Parameter	$C_{AB_treesl,i}$
Data unit	t C/ha
Description	Average carbon stock in the above-ground biomass per stratum i

Source of data	Phillips, J.F., Duque, A.J., Scott, C., Peña, M.A., Franco, C.A., Galindo, G., Cabrera, E., Álvarez, E. & Cárdenas, D. 2014. Aportes técnicos del Sistema de Monitoreo de Bosques y Carbono a la propuesta de preparación de Colombia para REDD+: datos de actividad y factores de emisión. Instituto de Hidrología, Meteorología, y Estudios Ambientales (IDEAM). Bogotá D.C., Colombia. 70 pp. -Yepes A.P., Navarrete D.A., Duque A.J., Phillips J.F., Cabrera K.R., Álvarez, E., García, M.C., Ordoñez, M.F. 2011. Protocolo para la estimación nacional y subnacional de biomasa - carbono en Colombia. Instituto de Hidrología, Meteorología, y Estudios Ambientales-IDEAM-. Bogotá D.C., Colombia. 162 p. Vieira et al. 2014. Plan de manejo de los manglares del Golfo de Tribugá. Nuquí -Yepes et al. 2015. Ecuaciones alométricas de biomasa aérea para la estimación de los contenidos de carbono en manglares del Caribe Colombiano. Rev. Biol. Trop. (Int. J. Trop. Biol. ISSN-0034-7744) Vol. 64 (2): 913-926, June 2016)
Value applied:	For forest: 108.9 tC/ha For mangrove: 103.56 tC/ha
Justification of choice of data or description of measurement methods and procedures applied	Values derived from national sources for the national GHG emissions balance.
Purpose of Data	<i>Estimation of baseline emissions</i> <i>Estimation of project emissions</i> <i>Estimation of leakage</i> <i>Ex ante y ex post.</i>
Comments	N.A

Data / Parameter	$C_{AB_trepost,i}$
Data unit	t C/ha
Description	Average carbon content in the above-ground biomass of the post-deforestation scenario

Source of data	IPCC 2003. Peak aboveground live biomass, DEFAULT ESTIMATES FOR STANDING BIOMASS GRASSLAND (AS DRY MATTER), Tropical - Moist & Wet. Table 3.45.2. Yepes, A., Navarrete D.A., Phillips J.F., Duque, A.J., Cabrera, E., Galindo, G., Vargas, D., García, M.C y Ordoñez, M.F. 2011. Estimación de las emisiones de dióxido de carbono generadas por deforestación durante el periodo 2005-2010. Instituto de Hidrología, Meteorología, y Estudios Ambientales-IDEAM-. Bogotá D.C., Colombia. 32 pp. AR-TOOL 14. A/R Methodological tool: Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities Version 04.2
Value applied:	For Crops and pastures: 2.91 tC/ha
Justification of choice of data or description of measurement methods and procedures applied	Values obtained by default from IPCC 2003 and adjusted according to methodological recommendations. Yepes et al (2011)
Purpose of Data	<i>Estimation of baseline emissions</i> <i>Estimation of project emissions</i> <i>Estimation of leakage</i>
Comments	N.A

Data / Parameter	$C_{DW_bsl,i}$
Data unit	t C/ha
Description	<i>Average carbon stock of dead wood of mangrove per stratum i</i>
Source of data	-UNFCCC_CDM. AR-AM Tool12.V0.3.0. Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities.
Value applied:	1.07
Justification of choice of data or description of measurement methods and procedures applied	They are procedures for conservative estimation established by the IPCC in national inventory data.
Purpose of Data	<i>Estimation of baseline emissions</i> <i>Estimation of project emissions</i> <i>Estimation of leakage</i>

Comments	The contribution is insignificant; therefore, it is not considered in the carbon balances. See Carbon_Balance_Ex ante y Ex post_RiscalesV04_13_06__2023, hoja 1_CBSL,tree
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Data / Parameter	CF_j
Data unit	$t\ C\ t^{-1}\ d.m$
Description	Carbon fraction of biomass for tree species j
Source of data	Species- or family-specific values from the literature (e.g. IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.3) shall be used if available, otherwise default value of $0.47\ t\ C\ t^{-1}\ d.m.$ can be used.
Value applied:	$0.47\ t\ C\ t^{-1}\ d.m$
Justification of choice of data or description of measurement methods and procedures applied	Default value $0.47\ t\ C\ t^{-1}\ d.m.$ can be used, or species-specific values from the literature (e.g. IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.3)
Purpose of Data	The Carbon fraction for dry wood was used to: • Calculate baseline emissions. • Calculate project emissions • Calculate leakage
Comments	Where new species are encountered in the course of monitoring, new carbon fraction values must be sourced from the literature or otherwise use the default value.

Data / Parameter	$C_{BSL-soil,i,t}$
Data unit	tC/ha
Description	Soil organic carbon (SOC) stock in forest soil under baseline scenario in stratum i in year
Source of data	IPCC 2006. Guidelines for National Greenhouse Gas Inventories. Chapter 2. -UNFCCC_CDM. AR-AM Tool12.V0.3.0. Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities.
Value applied:	$3.25\ tC/ha$

Justification of choice of data or description of measurement methods and procedures applied	Accor to Methodology
Purpose of Data	The Carbon fraction for dry wood was used to: • Calculate baseline emissions • Calculate project emissions • Calculate leakage
Comments	N.A

Data / Parameter	TOTFOR
Data unit	ha
Description	Total available national forest area
Source of data	IDEAM, 2014. Official National source.
Value applied:	57.652.676,01 ha
Justification of choice of data or description of measurement methods and procedures applied	Accor to Methodology. The values reported at the national level are taken.
Purpose of Data	• Calculate leakage baseline • Calculate project emissions • Calculate
Comments	N/A

Data / Parameter	PROTFOR
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Data unit	ha
Description	Total area of fully protected forests nationally
Source of data	SINAP. Official National source[1].
Value applied:	12.899.385,36 ha
Justification of choice of data or description of measurement methods and procedures applied	Accor to Methodology. The values reported at the national level are taken.
Purpose of Data	• Calculate leakage baseline • Calculate project emissions • Calculate
Comments	N/A

Data / Parameter	AVFOR
Data unit	ha
Description	Total available national forest area for unplanned deforestation; ha
Source of data	IDEAM, 2014 and SINAP. Official National source[2].
Value applied:	44.753.290,65 ha
Justification of choice of data or description of measurement methods and procedures applied	Accor to Methodology. The values reported at the national level are taken.

Purpose of Data	- Calculate leakage baseline - Calculate project emissions - Calculate
Comments	N/A

Data / Parameter	LBFOR
Data unit	ha
Description	Total available forest area for unplanned deforestation in the leakage belt; ha
Source of data	Estimated.
Value applied:	25.745 ha
Justification of choice of data or description of measurement methods and procedures applied	Accor to Methodology.
Purpose of Data	- Calculate leakage baseline - Calculate project emissions - Calculate
Comments	N/A

Data / Parameter	PROPLB
Data unit	Proportion

Description	Area of forest available in the leakage belt for unplanned deforestation as a proportion of the total national forest area available for unplanned deforestation (proportion)
Source of data	Estimated.
Value applied:	0,0006
Justification of choice of data or description of measurement methods and procedures applied	Accor to Methodology.
Purpose of Data	• Calculate leakage baseline • Calculate project emissions • Calculate
Comments	N/A

Data / Parameter	PROPRES
Data unit	Proportion
Description	Estimated proportion of baseline deforestation caused by population that has been resident
Source of data	Estimated. Official (government) data
Value applied:	95%
Justification of choice of data or description of measurement methods and procedures applied	Accor to Methodology.

Purpose of Data	• Calculate leakage baseline • Calculate project emissions • Calculate
Comments	N/A

Data / Parameter	PROPRES
Data unit	Proportion
Description	Estimated proportion of baseline deforestation caused by population that has been resident
Source of data	Estimated. Official (government) data
Value applied:	95%
Justification of choice of data or description of measurement methods and procedures applied	Estimated as proportion of the area deforested in the past 5 years by population resident in the leakage belt and project area
Purpose of Data	• Calculate leakage baseline • Calculate project emissions
Comments	N/A

Data / Parameter	PROPIMM
Data unit	Proportion

Description	Estimated proportion of baseline deforestation caused by immigrating population
Source of data	Estimated. Official (government) data
Value applied:	5%
Justification of choice of data or description of measurement methods and procedures applied	Estimated as proportion of the area deforested in the past 5 years by population resident in the leakage belt and project area
Purpose of Data	• Calculate leakage baseline • Calculate project emissions
Comments	The proportion of immigrant community is highly low and the areas in the project region and its vicinity constitute collective territories with community governance, which prevents immigrant populations from settling without their consent.

6.2 Data and Parameters Monitored

Data / Parameter	Project Forest Cover Monitoring Map
Data unit	Ha
Description	Map showing the location of forest land within the project area at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data	Landsat Images or other images with similar characteristics
Description of measurement methods and procedures applied	By using satellite images and remote sensing to map forest and non-forest covering the Project Area it would be determined if there are any variations in the forest in the project area. All maps will be >90% accurate.
Frequency of monitoring/recording	Every 5 years (or less) with Satellite images.
Value applied:	N/A

Monitoring equipment	<i>Landsat imagery or other images available with similar properties. Remote sensing software (e.g. ENVI, QGis)</i>
QA/QC procedures applied	<i>Field based accuracy assessment including accuracy assessment from high resolution imagery (<10m).</i>
Purpose of data	Indicate one of the following: • Calculation of project emissions
Calculation method	N/A
Comments	N/A

Data / Parameter	Project Mangrove Cover Monitoring Map
Data unit	Ha
Description	Map showing the location of mangroves land within the project area at the beginning of each monitoring period. If within the Project Area some mangroves is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data	Landsat Images or another images with similar characteristics
Description of measurement methods and procedures applied	By using satellite images and remote sensing to map forest and non-forest covering the Project Area it would be determined if there are any variations in mangroves in the project area. All maps will be >90% accurate.
Frequency of monitoring/recording	Every 5 years (or less) with Satellite images.
Value applied:	N/A
Monitoring equipment	<i>Landsat imagery or other images available with similar properties. Remote sensing software (e.g. ENVI, QGis)</i>
QA/QC procedures applied	<i>Field based accuracy assessment including accuracy assessment from high resolution imagery (<10m).</i>
Purpose of data	Indicate one of the following: • Calculation of project emissions
Calculation method	N/A
Comments	N/A

Data / Parameter	Leakage Belt Forest Cover Monitoring Map
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Data unit	Ha
Description	Map showing the location of forest land within the leakage belt at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data	Landsat Images or another images with similar characteristics
Description of measurement methods and procedures applied	By using satellite images and remote sensing to map forest and non-forest covering the Project Area it would be determined if there are any variations in the forest in the project area. All maps will be >90% accurate.
Frequency of monitoring/recording	Every 5 years (or less) with images.
Value applied:	N/A
Monitoring equipment	<i>Landsat imagery or another images available with similar properties. Remote sensing software (e.g. ENVI, QGis)</i>
QA/QC procedures applied	<i>Field based accuracy assessment including accuracy assessment from high resolution imagery.</i>
Purpose of data	Indicate one of the following: • Calculation of Leakage emissions
Calculation method	N/A
Comments	N/A

Data / Parameter	$A_{DefPA,i,u,t}$
Data unit	Ha
Description	The images used will be compatible with the ones already used in the estimations ex-ante in order to be compared.
Source of data	Landsat Images or other images with similar characteristics
Description of measurement methods and procedures applied	The data will be assessing at least every 5 years or if verification occurs
Frequency of monitoring/recording	Every 5 years (or less) with images.
Value applied:	N/A
Monitoring equipment	Landsat imagery or other images available with similar properties. Remote sensing software (e.g. ENVI, QGis)

QA/QC procedures applied	Field based accuracy assessment including accuracy assessment from high resolution imagery (<10m).
Purpose of data	Indicate one of the following: • Calculation of project emissions
Calculation method	N/A
Comments	For the scenario with Project, an effectiveness in reducing deforestation of 75% in the first five years of the project and 83% from year 6 to 30 is proposed. These initial targets are expected to be achieved through the activities proposed in the project. Especially those related to strengthening governance, productive alternatives and food security. These initial activities, which do not generate income from the sale of carbon credits, will be funded through international cooperation and are expected to continue in the long term with resources such as the sale of VCUs

Data / Parameter	$ADistPA,q,i,t$
Data unit	Ha
Description	Area impacted by natural disturbance in the project stratum i converted to natural disturbance stratum q at time t; ha
Source of data	From satellite images or field data.
Description of measurement methods and procedures applied	The images used will be compatible with the ones already used in the estimations ex-ante in order to be compared.
Frequency of monitoring/recording	This will be monitored on an annual basis
Value applied:	N/A
Monitoring equipment	Landsat imagery or other images available with similar properties. Remote sensing software (e.g. ENVI, QGIS) and GPS.
QA/QC procedures applied	N/A
Purpose of data	Indicate one of the following: • Calculation leakage emissions
Calculation method	N/A
Comments	N/A

Data / Parameter	Forest Land Changes in project area
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Data unit	Ha
Description	Map showing the location of Forest areas transformed to other land covers and uses, of each monitoring period.
Source of data	LULC maps created from Landsat Images or another images with similar characteristics.
Description of measurement methods and procedures applied	Determined from the spatial detection of changes in the forest by overlapping LULC maps of the dates that comprise the monitoring period
Frequency of monitoring/recording	Each monitoring period
Value applied:	N/A
Monitoring equipment	Landsat imagery or other images available with similar properties. Remote sensing software (e.g. ENVI, QGis) and GPS.
QA/QC procedures applied	N/A
Purpose of data	<i>Indicate one of the following:</i> • Calculation project emissions
Calculation method	N/A
Comments	N/A

6.3 Monitoring Plan

Objective of the Monitoring Plan

The monitoring plan aims to:

- Assess the effectiveness of project activities in reducing GHG emissions.
- Measure key indicators such as changes in forest cover, carbon stocks, and potential leakages.
- Ensure compliance with VCS methodology VM0007 and associated applicable modules.
- Provide reliable data to stakeholders, including auditors and community members, to validate project outcomes.

Scope of Monitoring

This plan covers:

- Forest and mangrove conservation activities: Changes in above- and below-ground biomass.
- Restoration and reforestation: Areas rehabilitated and resulting carbon stock increases.
- Fugitive emissions and leakage control: Monitoring deforestation in leakage belts.
- Community-based monitoring: Capacity-building initiatives and participatory monitoring programs.
- The methods used for generating/measuring, recording, storing, aggregating, collating and reporting data and parameters. Where relevant, include the procedures for calibrating monitoring equipment.
- The organizational structure, responsibilities and competencies of the personnel that carried out monitoring activities.
- The policies used for oversight and accountability of monitoring activities.
- The procedures used for internal auditing and QA/QC.
- The procedures used for handling any internal auditing performed and any non-conformances identified.
- The implementation of sampling approaches, including target precision levels, sample sizes, sample site locations, stratification, frequency of measurement and QA/QC procedures. Where applicable, demonstrate whether the required confidence level or precision has been met.

Monitoring Activities and Methods

Activity	Method	Frequency	Responsibility
Forest Cover Monitoring	Landsat images; field verification Or National data	Every verification event	Monitoring team
Mangrove Monitoring	Remote sensing; ENVI; field validation	Every verification event	Community- based monitors

Deforestation Baseline Validation	Stratification; historical deforestation rates	Annual	Remote sensing experts
Biomass Carbon Stock Measurement	Permanent plots; national biomass equations	Every 5 years	Field technicians
Leakage Monitoring	Mapping forest cover in leakage belt	Every 5 years	Leakage monitoring team
Community Training	Workshops; hands- on practice	Annual	ICCO and local trainers
Emission Calculations	Carbon balance modeling (BL-UP, M-MON, REDD- MF)	Verification period	Technical consultants

Parameters and Indicators

The following parameters are prioritized for monitoring, aligned with applicable methodology modules:

Parameter	Unit	Source	Purpose
Forest Cover	Ha	Landsat imagery	Baseline and project emissions
Mangrove Cover	Ha	Landsat imagery	Baseline and project emissions
Above- ground Biomass	tC/ha	IDEAM; IPCC data	Carbon stock estimation
Leakage Area	Ha	Remote sensing	Calculation of leakage emissions

SOC (Soil Organic Carbon)	tC/ha	IPCC default values	Carbon stock estimation in soils
Historical Deforestation	Ha/year	Landsat; historical data	Baseline projection

6.3.1 Organization

As the project's implementer, the Community Council of Los Riscasles will coordinate and manage monitoring procedures over the project lifetime. The General Assembly is the prime decision organism, which is the maximum decision authority; however, due to its large number of members, will unlikely be able to perform and coordinate the necessary procedures to conduct the Monitoring Plan. Thus, the Board of Directors is the most suitable organism to carry on this task, because of its reduced number of members and leading roles assigned to each one.

The Community Council's Board of Directors is composed of prepared and trained members that have the ability to make acute choices that benefit the entire community. In addition, community leaders were trained in all REDD+ aspects. Also, ICCO trained and engaged local community members in setting forest inventory plots. In any case, a key activity of the project will be the training of community members in MRV, and in administrative tasks.

It is recommended that monitoring will be monitored by experts to ensure that all monitoring standard operation procedures (SOP) are followed, and that forest monitoring teams are trained. As staff and contractors will inevitably change over the course of the project lifetime, current names and qualifications of individuals involved in monitoring and implementation will be listed in the Monitoring and Implementation Report prior to validation/verification.

Table 57. Requirements and Responsibilities for hire a Project Liason

Role	Responsibilities	Competencies
Project Liaison	Oversight of the project Direction of remote sensing, community, and monitoring experts Oversight of monitoring team training Review compliance with QA/QC procedures Report monitoring results to project proponents and assist in preparing monitoring and implementation reports	At least a bachelor's degree or equivalent Experience managing teams. Experience working in the same region or country as the project. Has a language in common with all subordinate managers

For the 2014-2020 period, the technical processes for estimating net Anthropogenic removals were developed by Fondo Acción in conjunction with ICCO Cooperation, and the monitoring of field activities was developed by the Community Council Los Riscales with the support of ICCO. The local liaison for the follow-up of activities oversaw the legal representative of the Los Riscales community council, with the support of the Governing Board. Considering the experience of the first monitoring process, staff training will be maintained, as well as communication with the institutions, so that the monitoring processes that are carried out in the future are assumed by the community and ICCO.

Capacity Building

- Training Frequency: Annual or as required for new staff.
- Content:
 - Use of monitoring equipment and software.
 - Understanding QA/QC protocols.
 - Methodological updates (e.g., changes in applicable modules).
- Outcomes: Certified monitors capable of independently validating data.

Reporting and Feedback Mechanisms

- Community Engagement: Present monitoring results in accessible formats (e.g., visual summaries).
- Feedback Loops: Incorporate community feedback into monitoring adjustments.
- Dispute Resolution: Address discrepancies collaboratively with local stakeholders.

6.3.1.1 Data

Methods for generating and storing data are described in the relevant monitoring SOPs and in the Monitoring Plan (Annex 37). Project liaison will ensure that data is appropriately collected, stored, and reported in the Monitoring and Implementation Report prior to verification. All climate monitoring parameters are detailed in Annex 19.

Data Validation

- Accuracy Assessments: Cross-check satellite data with ground truthing results.
- Consistency Checks: Ensure all calculations align with the VCS methodology (e.g., BL-UP and CP-AB).

Archiving: All data, including field notes, maps, and digital files, will be version-controlled and securely stored.

6.3.1.2 Management System

Each parameter measured will have an associated measurement SOP for each monitoring period, created by the Expert for each sector. If an SOP is adapted from one monitoring period to the next, the documents should be versioned and archived and the monitoring report reference the version and title of the SOP used for that monitoring period. All updates to SOPs shall be approved by the sector expert and the Project Liaison. The project liaison is responsible for ensuring that all SOPs are adhered to by the team managers.

6.3.1.3 Quality Assurance and Control

Objective of QA/QC

The QA/QC system ensures the reliability, accuracy, and transparency of monitoring data. It addresses potential errors, ensures compliance with the VCS methodology, and enhances stakeholder confidence.

The project liaison is responsible for creation and adaption of quality assurance and quality control (QA/QC) protocols as required, and for any technical direction of the sector experts or teams. The project liaison is responsible to make sure the QA/QC protocols are carried out by the sector experts.

All data will be reported to project proponents and local stakeholders and any discrepancies or disagreements will be rectified by explanation or joint visitation of activities in question. All available satellite data used in monitoring, validation, verification and certification will be archived and made available to auditors.

6.3.1.4 Calibration

All measurement and monitoring equipment shall be calibrated per the relevant SOP and the manufacturer's manual for that equipment.

- Calibration Frequency: Per manufacturer's recommendations and before major data collection events.
- Equipment: GPS devices, measurement tools for permanent plots, and remote sensing software.
- Documentation: Maintain calibration logs with equipment-specific records

6.3.1.5 Managing Data Quality

Internal Audits

The remote sensing experts are responsible for an internal audit of approximately 10% of the measurements for data and parameters monitored, using a risk-based assessment for selection. If there is a deviation of more than 5% in the measurement and re-measurement of the parameter, the deviation is to be investigated and resolved. When updating data stored electronically, the file should be versioned.

- Frequency: Annual.
- Scope: 10% of monitored data, focusing on high-risk parameters such as forest cover and biomass measurements.
- Methodology:
 - Random sampling of data points for re-measurement.
 - Comparison of field data with satellite-based observations.
 - Investigating deviations >5% and documenting corrective actions.

- Responsibility: QA/QC Manager, supported by internal auditors.

External Verification

Engage third-party auditors to review monitoring data and validate compliance with VCS standards.

Facilitate access to all records, including QA/QC documentation, to ensure transparency.

6.3.2 Initial Monitoring Plan

The initial monitoring follows the requirements for a REDD project including those stated in VCS Standard, AFOLU requirements, and VM0007 v1.6. 2020. Data and parameters available at validation are included in Section 6.1.

6.3.2.1 Climate

Climate benefits will be determined and monitored using remote sensing techniques, according to procedures included in the Climate Monitoring Plan (Annex 37).

Selected pools included and excluded in the project scenario and a justification for that decision are as follows:

Pools	Included	Justification
Above-ground tree biomass	Yes	Major carbon pool affected by project activities.
Above-ground non-tree biomass	Yes	Expected to increase from project activities.
Below-ground biomass	Yes	Major carbon pool affected by project activities.
Dead Wood	Yes	Potentially affected by project activities.
Litter	No	Excluded
Soil	Yes	Potentially affected by project activities.
Wood Products	No	Excluded

Table 58. Selected pools monitored

Monitoring and Implementation Reports will be posted in the public domain on the VCS websites and ICCO website in accordance with program's procedures. Summaries of

monitoring results will be disseminated to stakeholders and community members within the project zone prior to verification.

Different spaces have been carried out to socialize the preliminary results with the governing boards and ICCO Cooperation. By September 2022, processes for disseminating the results were developed, with the support of material in simple language and culturally appropriate for the Riscales community. Folders were delivered with this information, in order to be analyzed and understood in detail by the community.

7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

The monitoring period covers the years 2014-2020 (from April 1, 2014 to December 31, 2020), in which the reduction of emissions due to unplanned deforestation in the project area is demonstrated. Likewise, during the 2014-2020 period, the following REDD activities have been implemented that account for the reduction in deforestation and therefore in emissions.

7.1 Data and Parameters Monitored

The processes developed for the construction of the LULC spatial information for the 2014-2020 monitoring period are the same ones carried out for the construction of the baseline and are described in section 4. The results obtained in the change in the coverage of Forest to No Forest for the monitoring period, considering the implementation of the project, are shown in Figure 27.

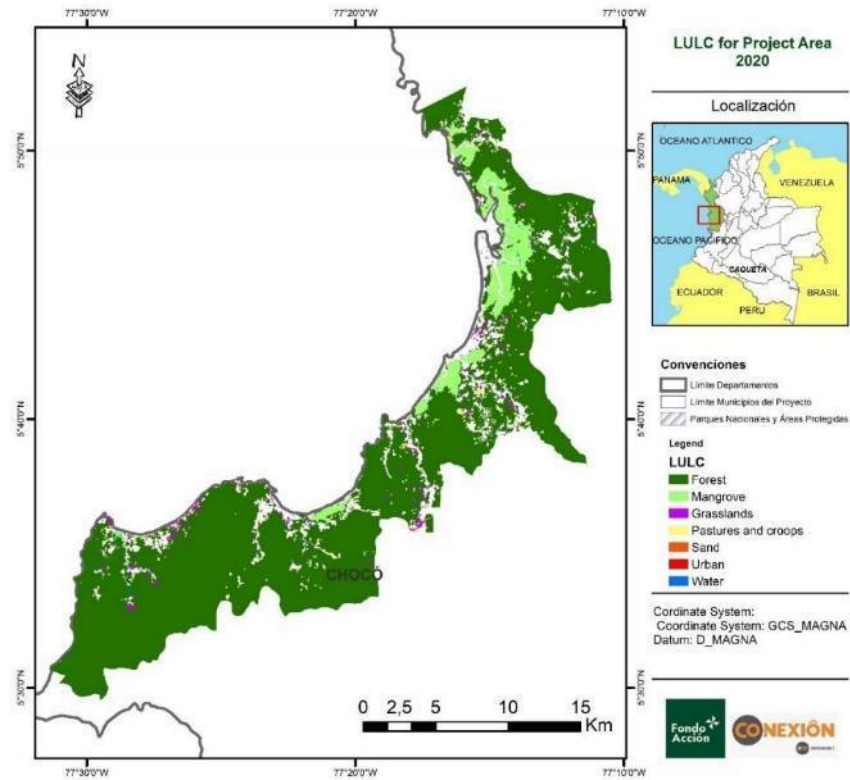


Figure 27. Land use Year 2020. Project Area.

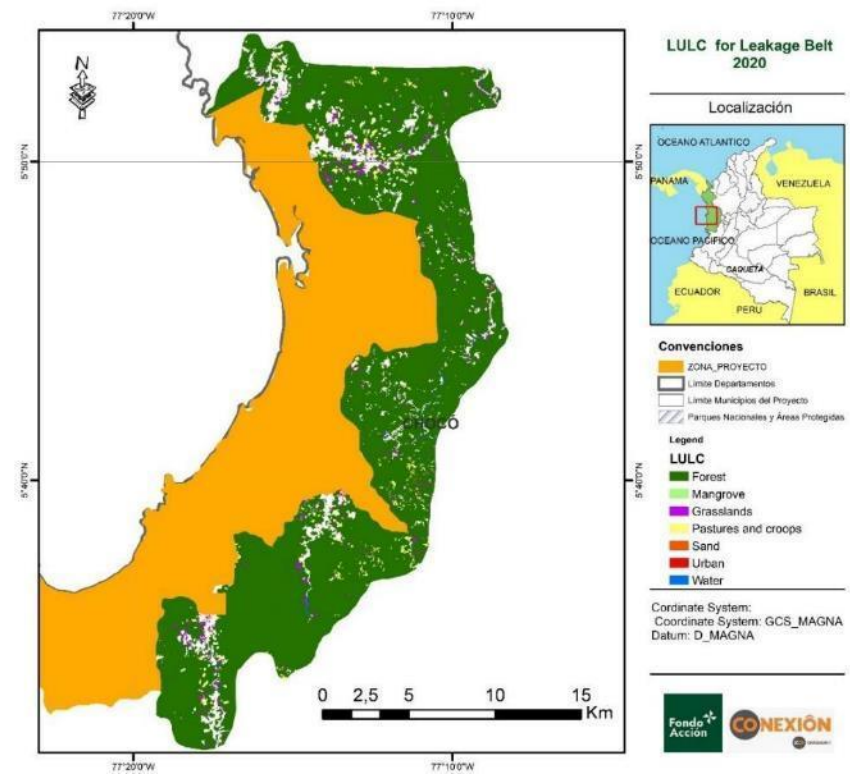


Figure 28. Land Use Leakage Belt Year 2020.

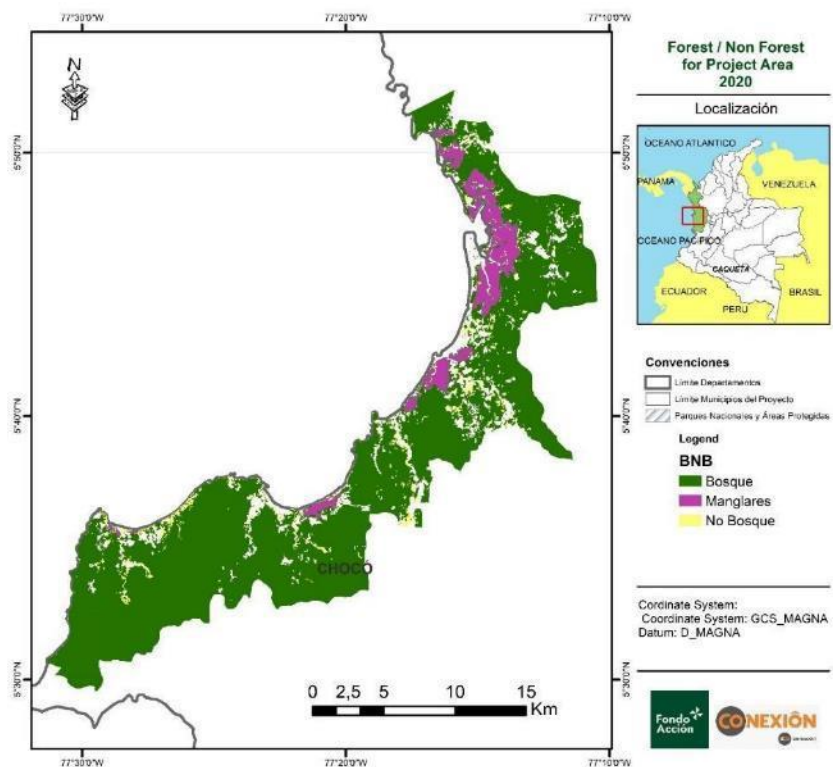


Figure 29. Forest/ Non Forest in the Project area. Year 2020.

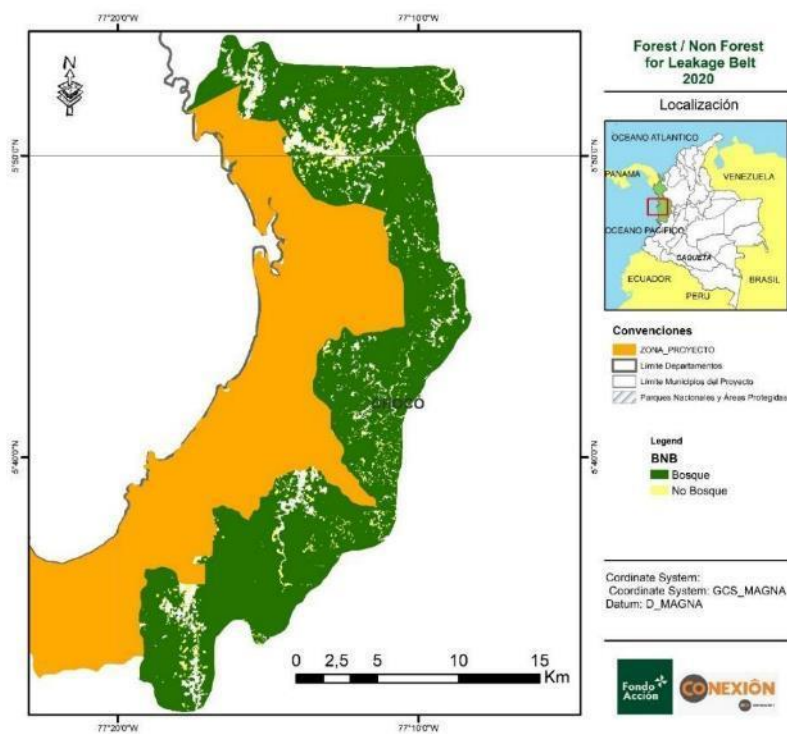


Figure 30. Forest/ Non Forest in the Leakage Belt. Year 2020.

Data / Parameter	AAIPPA _t
Data unit	Hectare (ha)
Description	Deforested area at time t within the project area; ha
Value applied:	2014 - 2020 Forest: 854,5 2014 - 2020 Mangroves: 43,3
Comments	From the non-forest forest data quantified by technical team of the project, for monitoring period

7.1.1 Data Parameters

Data / Parameter	AAIPLKB _t
Data unit	Hectare (ha)
Description	The deforested area at time t within the leakage belt; ha
Value applied:	2014 - 2020 Forest: 1,121.88 2014 - 2020 Mangroves: 0
Comments	From the non-forest forest data quantified by the technical team of the project for the monitoring period

7.2 Baseline Emissions

According to the projections developed for the baseline emissions (see section 5.1), changes in the 2014-2020

Table 59. Balance of emissions monitored in the period 2014-2020 (ha)

t	Year	ABSL,PA,unplanned,t (ha) Forest	ABSL,PA,unplanned,t (ha) Accumulated Forest	ABSL,PA,unplanned,t (ha) Mangrove	ABSL,PA,unplanned,t (ha) Accumulated Mangrove	Total ABSL,PA,unplanned,t (ha) Accumulated
0	2014	226.94	226.94	12.10	12.10	239.0
1	2015	302.59	529.53	16.13	28.23	557.8
2	2016	302.59	832.12	16.13	44.36	876.5
3	2017	302.59	1134.71	16.13	60.49	1,195.2
4	2018	302.59	1437.30	16.13	76.63	1,513.9
5	2019	302.59	1739.89	16.13	92.76	1,832.6
6	2020	75.65	1815.53	4.03	96.79	1,912.3

Table 60. Balance of emissions projected in the period 2014-2020 tCO₂

Year	CBSL,PA, unplanned, t Forest(tCO ₂)	CBSL,PA, unplanned, t mangrove(tCO ₂)	CBSL,total forest(tCO ₂)
2014	97.852,2	4.819,3	102.671,5
2015	130.469,6	6.425,7	136.895,3
2016	130.469,6	6.425,7	136.895,3
2017	130.469,6	6.425,7	136.895,3
2018	130.469,6	6.425,7	136.895,3
2019	130.469,6	6.425,7	136.895,3
2020	32.617,4	1.606,4	34.223,8
			821.371,6

7.3 Project Emissions

The spatial analysis processes for 2014-2020 are the same as those developed for the baseline analysis and are described in section 5. According to step 2 of module VMD0015, the net carbon stock change as a result of deforestation is equal to the area

deforested multiplied by the emission per unit area, as seen in equations 3 for project area:

Eq. 3

Where:

= Net carbon stock change as a result of deforestation in the project case in the project area in stratum i in year t ; t CO₂-e)

= Area of recorded deforestation in the project area stratum i converted to land use u in year t ; ha

= Net carbon stock changes in all pools in the project case in land use u in stratum i in year t ; t CO₂-e ha⁻¹

= 1, 2, 3, ... U post-deforestation land uses

= 1, 2, 3, ... M strata in the project scenario

= 1, 2, 3, ... t^* years elapsed since the start of the project activity

The emission per unit area is equal to the difference between the stocks before and after deforestation minus any wood products created from timber extraction in the process of deforestation.

Table 61. Deforestation monitored period 2014-2020 (ha).

ID	u post deforestation land uses, for i strata (forest)	2014-2020 t (Ha)	2014-2020 (Ha) Proportion to Titled Area	Proportion 2014-2020
1	Stand Forest	29.389,60	25.101,96	90,1%
3	Forest to Grassland	546,75	466,98	1,7%
4	Forest to Pastures	371,21	317,05	1,1%
5	Forest to Sand	11,02	9,41	0,0%
6	Forest to Settlements	3,15	2,69	0,0%
7	Forest to water	68,33	58,36	0,2%

ID	u post deforestation land uses, for i strata (mangrove)	2014-2020 t (Ha)	2014-2020 (Ha) Proportion to Titled Area	Proportion 2014-2020
8	Stand Mangrove	2.308,09	1.971,36	7,1%
9	Mangrove a Grassland	10,99	9,38	0,0%
10	Mangrove a Pastures	10,62	9,07	0,0%
11	Mangrove to Sand	0,09	0,08	0,0%
12	Mangrove to Settlements	0,63	0,54	0,0%
13	Mangrove to Water	28,33	24,20	0,1%

The results of net carbon stock change as a result of deforestation in the project case in the project area in stratum i in year t; t CO₂-e) are:

Table 62. Unplanned deforestation avoided in the period 2014 – 2020 (ha).

t	Year	A_{DefPA} Forest ha ⁻¹ year ⁻¹	A_{DefPA} Forest accumulated ha	A_{DefPA} Mangrove ha ⁻¹ year ⁻¹	A_{DefPA} Mangrove accumulated ha	A_{DefPA} Accumulated Total (ha)
0	2014	106.81	106.81	5.41	5.41	112.22
1	2015	142.42	249.23	7.21	12.62	261.85
2	2016	142.42	391.64	7.21	19.83	411.48
3	2017	142.42	534.06	7.21	27.04	561.10
4	2018	142.42	676.48	7.21	34.25	710.73
5	2019	142.42	818.89	7.21	41.47	860.36
6	2020	35.60	854.50	1.80	43.27	897.77

t	Year	ΔA_{DefPA} Forest ha ⁻¹ year ⁻¹	ΔA_{DefPA} Forest accumulated ha ⁻¹	ΔA_{DefPA} Mangrove ha ⁻¹ year ⁻¹	ΔA_{DefPA} Mangrove accumulated ha ⁻¹	ΔA_{DefPA} Total accumulated ha ⁻¹
0	2014	120.13	120.13	6.69	6.69	126.82
1	2015	160.17	280.30	8.92	15.61	295.91
2	2016	160.17	440.47	8.92	24.53	465.01
3	2017	160.17	600.65	8.92	33.45	634.10
4	2018	160.17	760.82	8.92	42.37	803.19
5	2019	160.17	920.99	8.92	51.29	972.28
6	2020	40.04	961.04	2.23	53.52	1,014.56

The ex-post avoided emissions from the implementation of the REDD+ initiative was developed following the methodological steps described in section 4.2, with the values monitored 2014-2020.

Comparing the deforestation dynamics of the baseline against the implementation period 2014-2020, a clear reduction in deforestation is noted for that period (see Figure 31).

Table 63. Comparison between the behavior of the baseline vs. monitoring for the 2014-2020 period.

Year	ABSL,PA,unplanned, t (ha) BOSQUE+Mangrove	ABSL,PA,unplanned, t (ha) accumulated (ha)	Bosque maduro + Mangrove A_{DefPA}	Bosque maduro + Mangrove Accumulated A_{DefPA}
2014	239.04	239.04	112.22	112.22
2015	318.72	557.76	149.63	261.85
2016	318.72	876.48	149.63	411.48
2017	318.72	1,195.20	149.63	561.10
2018	318.72	1,513.92	149.63	710.73
2019	318.72	1,832.64	149.63	860.36
2020	79.68	1,912.32	37.41	897.77

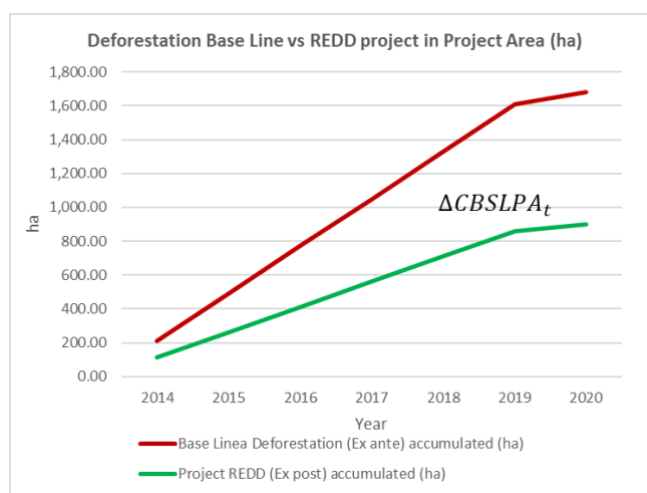


Figure 31. Comparison between ex ante projection and ex post performance of unplanned deforestation in the project area (ha). The space between the lines refers to the avoided deforestation in the monitoring period.

The results of avoided emissions are:

Table 64. Emissions avoided by the implementation of the REDD project for the period 2014-2020 in the project area.

Year	Accumulated $C_{BSL,total\ forest}(tCO_2)$	Accumulated $C_{P,total\ forest}(tCO_2)$	$\Delta C_{P,forest}(tCO_2)\text{ year}$
2014	102.671,45	48.209,37	54.462
2015	239.566,72	112.488,54	72.616

2016	376.461,99	176.767,71	72.616
2017	513.357,27	241.046,87	72.616
2018	650.252,54	305.326,04	72.616
2019	787.147,81	369.605,21	72.616
2020	821.371,63	385.675,00	18.154
			435.697

7.4 Leakage

In accordance with VM0007 module LK-ASU v1.2 the net CO₂ emissions due to deforestation displaced from the project area to the leakage belt are calculated as follows:

$$\Delta C_{LK-ASU-LB} = C_{P,LB} - \Delta C_{BSL,LK,unplanned}$$

Where:

$\Delta C_{LK-ASU-LB}$ Net CO₂ emissions due to unplanned deforestation displaced from the project area to the leakage belt up to year t^* (t CO₂e).

$C_{P,LB}$ Net greenhouse gas emissions within the leakage belt in the project case up to year t^* (t CO₂e).

$\Delta C_{BSL,LK,unplanned}$ Net CO₂ emissions in the baseline from unplanned deforestation in the leakage belt up to year t^* (t CO₂e)

If $\Delta C_{LK-ASU-LB}$ as calculated is <0 then $\Delta C_{LK-ASU-LB}$ must be set equal to 0 (to prevent positive leakage).

Table 65. Comparison of the estimated leakages in the baseline vs. the monitoring period 2014-2020.

Year	Total $\Delta C_{BSL,LK,unplanned}$ (tCO ₂)	Total $\Delta C_{P,LB}$ (tCO ₂)	$\Delta C_{LK-ASU-LB}$ (tCO ₂)	$\Delta CLK-ASU-LB$ (tCO ₂)*
2014	92.802,4	60.466,3	-32.336,09	0.00
2015	123.764,2	80.621,7	-43.142,48	0.00
2016	123.749,8	80.621,7	-43.128,03	0.00
2017	123.735,3	80.621,7	-43.113,58	0.00
2018	123.720,9	80.621,7	-43.099,13	0.00
2019	123.706,4	80.621,7	-43.084,68	0.00
2020	123.692,0	20.155,4	-103.536,53	0.00

*Given that $\Delta CLK-ASU-LB < 0$, leakages for the monitoring period (from April 1, 2014 to December 31, 2020) are equal to zero.

7.5 Net GHG Emission Reductions and Removals

Net GHG Emission Reductions and Removals can be summarized as the “Estimated baseline emissions” minus the “Estimated project emissions” minus the “Estimated leakage emissions”. The risk analysis determined for the Project is set at 12 (see Risk tool), therefore this is the value (%) to be discounted as Project Buffer. According to eq. 15 to VM0007 the buffer is calculated:

$$Buffer_{Unplanned} = \left(\frac{\Delta C_{BSL,Unplanned} - \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{FC,i,t} + N_2O_{direct,i,t})}{\Delta C_{P,Unplanned} - \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{FC,i,t} + N_2O_{direct,i,t})} \right) \times Buffer \% \quad (15)$$

Where:

$Buffer_{Unplanned}$ Buffer withholding for avoiding unplanned deforestation project activities (t CO₂e).

$\Delta C_{BSL,Unplanned}$ Net GHG emissions in the baseline from unplanned deforestation (t CO₂e).

$E_{FC,i,t}$	Emission from fossil fuel combustion in stratum i in year t (t CO ₂ e).
$N_2O_{direct-N,i,t}$	Direct N ₂ O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t (t CO ₂ e).
$\Delta C_{P,Unplanned}$	Net GHG emissions within the project area in the project scenario (t CO ₂ e).

For the current monitoring period (2014-2020), the increase in emissions resulting from the use of fossil fuels and the application of nitrogen fertilizers are not considered. This is mainly due to the fact that REDD activities do not increase emissions of this type, in reference to the normal practices and activities of the community defined in the baseline, and on the other hand, following the recommendations of the VM0007 V1.6 methodology, Table 7 defines that these emissions can be excluded because their emission potential is insignificant.

Verified Carbon Units, VCU's

The buffer only discounts values to REDD emission reductions, not including leakage values if they occur or are discounted in the project for the monitoring period. With respect to leakage, as mentioned in the previous paragraphs, these values are equal to zero (0).

$$VCUt = NERREDD - Buffer\ total$$

Where:

$VCUt$ Number of Verified Carbon Units (VCU); tCO₂e

$NERREDD$ Total net GHG emission reductions due to REDD+ project activity up to year t^* (tCO₂e)

$Buffertotal$ Total reservation for risk of non-permanence; tCO₂e

Table 66 presents the ex-post estimate of the Verified Carbon Units (VCU) for the 2014-2020 monitoring period.

Table 66. Balance ex-post, estimation of the number of Verified Carbon Units (VCU) 2014-2020.

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	NERREDD (tCO ₂) year	Buffer unplanned (12%) tCO ₂ year	VCUs eligible for Issuance Year
2014	102.671,45	48.209,37	0.00	54.462	6.535	47.927
2015	136.895,27	64.279,17	0.00	72.616	8.714	63.902
2016	136.895,27	64.279,17	0.00	72.616	8.714	63.902
2017	136.895,27	64.279,17	0.00	72.616	8.714	63.902
2018	136.895,27	64.279,17	0.00	72.616	8.714	63.902
2019	136.895,27	64.279,17	0.00	72.616	8.714	63.902
2020	34.223,82	16.069,79	0.00	18.154	2.178	15.976
Total	821.371,63	385.675,00	0	435.697	52.284	383.413

Table 67. Comparative Values of Reduced Emissions (tCO₂/year) ex ante vs expost 2014-2020.

Year	<u>Ex-ante emissions reductions/removals</u>	<u>Achieved emissions reductions/removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
2014	61.262,4	47.927	27,8%	Start of implementation of activities.
2015	81.684,3	63.902	27,8%	Slow implementation related to the flow of economic resources.
2016	81.684,4	63.902	27,8%	
2017	81.684,5	63.902	27,8%	
2018	81.684,6	63.902	27,8%	
2019	81.684,7	63.902	27,8%	
2020	81.684,8	15.976	80,4%	Only three months of 2020 are counted ex post vs. 12 months of the ex ante. After the first three months of 2020, it must be updated with the country's reference level.

8 APPENDIX 1: ANNEXES

Annexes	ID
Nuqui and Jurubira mangrove restoration agreements, and Annex Payments mangrove restoration agreement	1
Strengthening capacities FOS-KIA Project	2
DRMI Acuerdo 011_2014	3
Mangrove Management Plan	4
Sembrar y cosechar leña. Manual para el establecimiento de huertos leñeros	5
Sembrando y construyendo un mejor vivir - Recuperación del manglar	6
Cocinar Conservando. Manual para la construcción de fogones ahorraleña	7
Parcelas y restauracion manglar	8
Protocolo aprovechamiento flora no maderable Biocomercio_Vainilla	9

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