Synthesis Report

Project:
Integrating Jurisdictional REDD into Colombia's climate mitigation policies including a national ETS

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* This Synthesis Report is based on the Project‘s Engagement Report, Policy Design Report and Modeling Report

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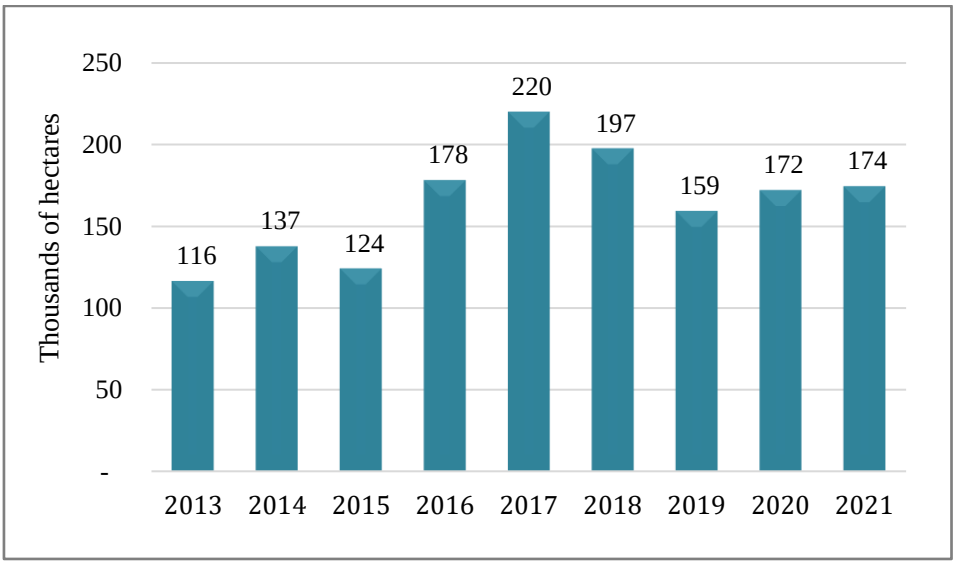
1. INTRODUCTION

This project explores the challenges and opportunities involved in potentially implementing Jurisdictional REDD+ (JREDD) programs in Colombia. JREDD programs have the potential to help Colombia achieve its Nationally Determined Contribution (NDC) while also supporting local livelihoods.[1] The JREDD approach promises payments for large-scale avoided tropical deforestation and high social and environmental integrity. Unlike project-based initiatives, JREDD requires changes in the economic development model at the regional level, operating at a scale consistent with the jurisdiction where key deforestation drivers emerge. This approach addresses recent concerns about environmental integrity regarding carbon offsets, including baseline setting and carbon leakage.

This project illustrates how, through the use of national and international private and public finance, a JREDD approach can improve forest governance in Colombia and significantly reduce deforestation. About 55 per cent of the country´s land area is still covered by forests, including the highly biodiverse tropical forests of the Amazon and Choco regions. These forests, however, are under serious threat and are rapidly receding. In 2021, a total of 174,103 hectares of forests was cleared, representing a 1.5% increase from the previous year, with most deforestation occurring in the Amazon region (see Figure 1). Deforestation increased following the signing of a peace agreement between the state and the main guerrilla group in 2016, and the country is currently struggling to return to pre-agreement deforestation levels.

Figure 1 Deforestation in Colombia, 2013-2021



Sources: Years 2013 to 2020: Minambiente and IDEAM (2021) Deforestation Monitoring Results. Year 2021: Minambiente. News July 15 (2022) Deforestation is reduced and contained in Colombia.

At the international level, the US$1 billion **Lowering Emissions by Accelerating Forest Finance (LEAF) Coalition** represents a major source of funding for JREDD. Launched in 2021, the goal of this private-public partnership is to halt deforestation by financing large-scale forest protection in the tropics. This project illustrates how the Colombian government can use public funds to not only to tap into these international sources but also to leverage local private

[1] REDD - Reducing Emissions from Deforestation and Degradation. REDD+ it is REDD that includes the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks.

finance for forest protection. Colombia´s Climate Law of 2018 enables the government to adopt an **Emissions Trading System (ETS) or a National Program for Tradable Emission Quotas (PNCTE** for its acronym in Spanish**)** (Law 1931 of 2018). A more recent law (Law 2126 of 2021) stipulates that the PNCTE should be fully implemented by 2030, implying that the first deployment steps should be taken a few years earlier. The country´s Climate Law explicitly states that the PNCTE can grant tradable quotas to non-regulated actors, either private or public entities, such as forest jurisdictions, that voluntarily implement initiatives that reduce or remove greenhouse gas emissions, such as reducing deforestation. This quota allocation is subject to emissions reductions being verified, certified, and registered in a national registry. These quotas can then be sold to regulated actors, typically local private companies. Forest jurisdictions can thus become active players in the local carbon markets and potentially help the country achieve its mitigation targets cost-effectively.

According to Colombia´s Third Biennial Update Report to the UNFCCC, the country's **net emissions were 279.2 $MtCO_2$ in 2018** (IDEAM et al. 2021). In that same year, Agriculture, Forestry and Other Land Use (AFOLU) accounted for 59% of total emissions in 2018, with deforestation representing 33% of total emissions that year. AFOLU emissions remain largely unregulated, and the demand for JREDD credits in a national ETS would come from regulated sectors, including energy (31% of total emissions), industry (3% of total emissions) and waste (7% of total emissions). Colombia officially updated its **NDC** in 2020, committing to **emit a maximum of 169.44 $MtCO_2$ in 2030**. This represents a 51% reduction compared to the baseline or business-as-usual scenario for 2030 (Government of Colombia 2020). The country´s NDC includes a **deforestation target of 50,000 hectares in 2030**, which is approximately 28% of recent deforestation levels (see Figure 1).

The implementation of JREDD is a challenging process that requires proper articulation of different funding sources within a fair and cost-effective institutional framework. All relevant actors in the territory should unite around an overall conservation target. Expectations on emissions reduction potential and external benefits must be realistic. JREDD should be managed by an authority that facilitates the monitoring of CO_2 inventories, deforestation rates, and emissions reductions resulting from the implementation of REDD initiatives. Transactions between the jurisdiction and external actors must be transparent, and benefit-sharing rules must be accepted by key local stakeholders. To address some of these challenges, this project has set the following objectives:

(i) To initiate an engagement process with key stakeholders that will enable the roll out of the JREDD program in Colombia, helping local Colombian communities thrive, and
(ii) To assess the effectiveness of policy designs that integrate jurisdictional REDD program, international transfers of mitigation through the LEAF Coalition, and Colombia´s other mitigation policies including, a national ETS in helping Colombia meet its NDC.

2. PROJECT APPROACH

The timeframe for this project was January 2022 to March 2023. The project utilized a bottom-up stakeholder-driven methodology, with local Indigenous communities, cattle ranchers, government officials, NGOs, and other key stakeholders informing research. The project activities were organized along three interrelated pillars: engagement, policy design, and modeling.

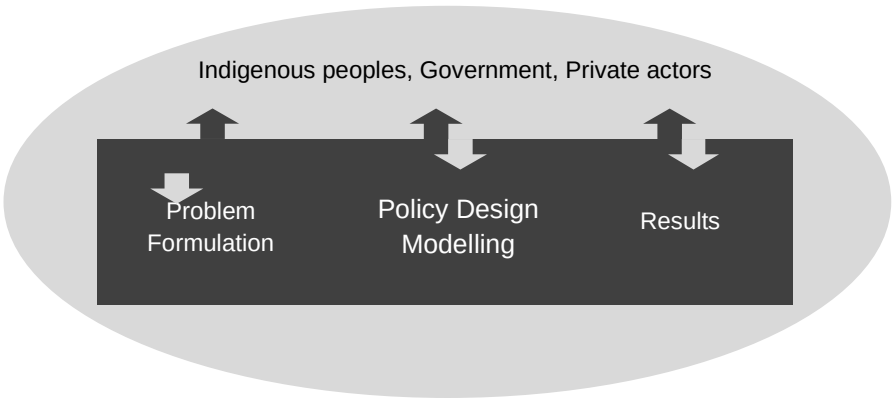
(i) **Policy Design:** This pillar presents an in-depth description and diagnosis of existing climate policies and initiatives in Colombia to formulate a policy proposal for the implementation of JREDD programs in the country.

(ii) **Engagement:** In the stakeholder interaction model used in this study, both researchers and stakeholders play active roles throughout the research process (see Figure 2). A number of national and subnational engagement workshops and meetings were conducted throughout the project.

(iii) **Modelling:** This pillar calibrated a simple partial equilibrium model that integrates JREDD programs into Colombia´s climate regulation. It considered scenarios where JREDD could be funded by different sources including the national budget, the PNCTE, and international sources such as the LEAF Coalition.

Section 3 describes the three pillars in further detail and elaborates on the results obtained under each pillar.

Figure 2 Engagement Approach



Adapted by the authors from Knaggard et al. 2019

3. ENGAGEMENT

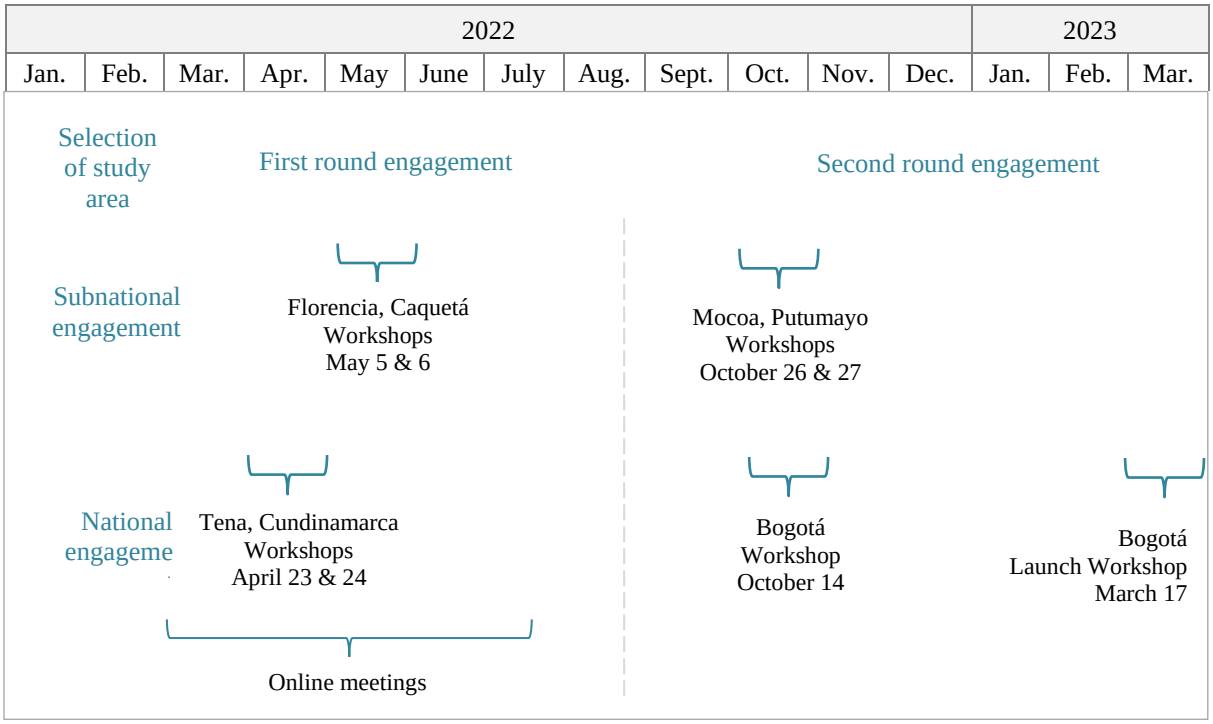
3.1 Approach for the Engagement Process

Integrating JREDD programs into Colombia's climate mitigation policies effectively and equitably demands the participation of multiple stakeholders. This research project explicitly acknowledges that communication between the research group and those actors, or stakeholders, who have an interest or could be potentially affected by the research project is crucial for the production and sharing of credible and legitimate knowledge (see Figure 2). The large geographical scale of a JREDD program involves coordination among several governmental institutions and actors across the selected jurisdiction, while the adoption of an ETS requires a profound understanding of compliance carbon market. A lack of understanding of actors´ underlying motivations may lead to misguided recommendations on effective agreements, rules, procedures, and incentives for the land users, the private sector, and the Government. We thus planned and undertook a number of engagement activities with national

and subnational government institutions, private actors and Indigenous communities to gain relevant information on carbon markets and land use within highly deforested areas.

The subnational engagement was performed in a geographical area with the largest carbon emissions from deforestation in the Colombian Amazon region, namely the departments (Colombian States) of Caquetá and Putumayo. These departments were carefully selected applying a multi-criteria prioritization method, which is described in detail in the Project Report on Engagement. Four one-day workshops with indigenous and non-indigenous communities were held in Florencia (Caquetá) and Mocoa (Putumayo); see Figure 3.

Figure 3 Engagement Activities



The national engagement was undertaken via a series of Zoom meetings with repersentatives from the private sector and through two half-day workshops that were held in Bogotá. The research team also presented in and participated in a two-day workshop with indigenous communities from the Colombian Amazon in a municipality nearby Bogotá (see Figure 3). The engagement activities performed under this project provided fundamental feedback for the possible implementation of a JREDD approach in Colombia that is leveraged by national and international financial sources. The interaction of the team with the three main actors Government, private sector and Indigenous communities led to the identification of some challenges and opportunities for JREDD implementation and recommendations for each kind of stakeholder. The outputs from the engagement process have been explicitly used in the Policy Design and Modeling components of the project.

3.2 Results and Recomendations from the Engagement Process

General recommendations that have emerged from the engagement activities are presented below.

Capacity building in carbon markets and jurisdictional approaches among private actors, local, and Indigenous communities, and government officials. It should cover national and international regulatory frameworks, including Colombia´s Emissions Trading System as laid out in the country´s Climate Law of 2018 and the United Nations Framework Convention for Climate Change (UNFCCC).

- While Indigenous leaders are familiar with the basics of carbon pricing and offsetting, most Indigenous communities do not understand the concept and view carbon markets with a high degree of scepticism. The interactions with earlier project implementers have not always been positive. They find that those who benefit the most from these projects are external actors. Local communities lack the capacity to design, implement and manage forest carbon projects that effectively support their livelihoods. Improving their planning, management, and analytical capabilities is a necessary condition for effective participation and governance from Indigenous groups.

- There is a relatively high degree of scepticism among private actors towards the proposed jurisdictional programs in Colombia. They consider these to be State intervention in the marketplace but acknowledge that environmental integrity has been problematic in certain areas. Notably, the non-causation mechanism of the current carbon tax as well as transfers from the international voluntary market have promoted an active carbon forest market in Colombia. There is an opportunity to constructively engage with the private sector in order to discuss and clarify their role in jurisdictional approaches and thus facilitate the use of these approaches in the role out of a national ETS.

Building institutional capacity at the local, regional and national levels that enables the emergence of a healthy carbon market with high quality credits in the forest sector. This includes human capital, information systems, technological infrastructure, and financial resources.

- The State´s capacity to effectively deploy a JREDD program was questioned. For example, it was pointed out that mechanisms like the National Emissions Reduction Registry (RENARE) have been ineffective and inefficient, even thwarting the implementation of the REDD+ projects, which shows that there is a lack of the institutional capacity needed to implement a jurisdictional program. The implementation of effective mitigation projects needs joint action and investments from private actors, the State and the communities. Therefore, the strong potential of NGOs as operators in environmental interventions in the communities must be taken into account, along with their role in channelling resources from different sources (international, private, and public).

- In addition, there must be successful institutional mechanisms to acknowledge and protect the right and the autonomy of the diverse local actors over their lands. Currently, the absence of these means and the presence of illegal activities and actors, corruption, and violence provide an uneven playing field for local negotiations, limit effective communication and governance, and ultimately bias the conservation incentives of the local land users, leading to an inefficient allocation of resources.

- Lack of governance and political will to undertake ambitious conservation efforts at the national level and subnational institutions should be addressed. For instance, the presence of environmental authorities and law enforcement is needed to improve environmental control and avoid illegal deforestation. Unlike project-based initiatives, JREDD entails the

design and implementation of policies and institutions that seek large-scale changes in the economic development model at the regional level.

- Finally, the communication channels between the Ministry of the Environment and Sustainable Development (Spanish acronym MADS) and Emergent, as well as other international financial sources, should be improved. Even though the research team was able to a facilitate a communication channel between both institutions, a constant and more fluid dialogue is fundamental to increase the country´s possibilities to access international funding for forest protection and to adopt a JREDD approach.

Engendering conditions that lead to binding agreements among international, national, regional and local actors.

- While jurisdictional programs are valuable sources of funding that can help reduce deforestation in the tropics, it is important to understand how these programs relate to national and subnational conservation policies. Without such an understanding, it would be difficulty for international funders to reach effective conservation agreements with countries such as Colombia. At COP 27 in Sharm el Sheikh in December 2022, the Colombian Government pledged to create a multimillion-dollar fund to protect the Amazon region and it has invited other countries and institutions to contribute to this fund. By pledging to commit national financial resources to reduce deforestation, the Colombian Government has positioned itself in a new bargaining position in the international arena. Also, it is important to note that there have been effective changes in the financial structure of the Government with the creation of the FONSUREC, the establishment of a limit on non-causation, and the channelling of 80% of the resources from the carbon tax into environmental investments.

- Effective participation of all interested stakeholders starting at the planning stages is required for a successful implementation of jurisdictional programs. This includes effective participation in outlining land use plans and development plans at the municipal and regional levels. This is resource-demanding, and the corresponding funding should be allocated to these activities.

- On the other hand, the MADS believes that the economic benefits offered by biodiversity and ecosystem are yet to be harnessed within the local economy and emphasizes the importance of advancing in reforms such as the territorial ordering of water and the implementation of the Climate Action Plan and the Climate Law, among others. To achieve this, the involvement of the private sector is key. As a starting point, private sector representatives may become more acquainted with the vulnerability of value chains to climate change. They may find benefits in adding Nature-based solutions to their management toolkit.

- Whenever programs are designed or implemented, interventions must ensure Free, Prior, and Informed Consent (FPIC) for Indigenous Peoples as a ratified fundamental right for Indigenous Peoples. Additionally, establishing binding safeguards for the national Government in concordance with the Cancun Safeguards is essential. As a fundamental right, there is a need to also mention equitable access to information, including full explanations of the scope of proposals, in a transparent manner that is technically accessible and culturally appropriate. These processes must comply with the local systems of knowledge and traditions to ensure that the customary consultation protocols are being respected.

- Lastly, Indigenous representatives indicated that the valuation of forests based on its carbon content is reductionist and overlooks the wealth that forests represent for Indigenous communities. The leaders of the Organization of Indigenous Peoples of the Colombian Amazon (OPIAC) insist that the value of the forests is not only a question of carbon but a group of factors including traditional knowledge, cultural patrimony, ecosystem services, and their spiritual and territorial importance. Hence, it cannot be reduced to a monetary transaction that recognizes only the value of carbon. A valuation of the whole set of ecosystem services provided by the forests must be considered.

4. POLICY DESIGN

4.1 Policy Background

A milestone in the creation of a carbon market in Colombia is the inception of a carbon tax, which was coupled with an offset mechanism (Law 1819 of 2016). In particular, regulated actors that demonstrate carbon neutrality were exempt from the carbon tax. The tax was introduced in 2017 at a rate equivalent to approximately US$5 per ton of CO_2eq. It initially covered natural gas, liquefied petroleum gas, gasoline, jet fuel and Diesel. In the 2017 – 2021 period, 37.52 $MtCO_{2eq}$ per year were covered by this tax regime, out of which an average of 23.62 $MtCO_{2eq}$ per year (63%) effectively generated the respective tax payments and 13.90 $MtCO_{2eq}$ per year (37%) benefited from the non-causation or offset mechanism—most of the offsets belonging to the forest sector (Minambiente 2022 and DIAN 2022). In 2021, the share of emissions that were offset reached 58% of total emissions which is a clear indication of the effect of the non-causation regulation on the carbon market where most of the offsets are from the forest sector. Concerns regarding the erosion of the tax base and the environmental integrity of compensation recently led the Government to set a limit to the proportion of emissions that each agent can be offset (2022 Tax Reform).

The JREDD program approach combines two related concepts: the concept of REDD+ projects and programs, with a long history at the international level and with formalized developments in public policies; and the concept of jurisdictional programs, which has recently appeared in the international context and has so far undergone fairly preliminary developments. REDD, as it was initially known, emerged in 2007 with the recognition that deforestation and forest degradation are driven by factors that make conservation particularly challenging for developing countries. The general idea of using a compensation mechanism to preserve forests was appealing to developing countries whose position in climate negations has consistently emphasized the principle of common but differentiated responsibilities. However, despite REDD+ programs and projects being deployed worldwide, high rates of deforestation and ecosystem degradation remain (see for instance, Lamb et al. 2021).

Against this backdrop, JREDD has emerged as a promising method to deliver high-integrity, large-scale, avoided deforestation. Unlike project-based initiatives, JREDD entails the design and implementation of policies and institutions that seek large-scale changes in the economic development model at the regional level. It aims at reducing deforestation and forest degradation and both expanding and conserving existing forest carbon stocks. A JREDD program may cover a national or a subnational territory. It is managed by an authority who implements a regulatory framework that facilitates the monitoring of CO_2 inventories, deforestation rates and the reduction of greenhouse gas (GHG) emissions resulting from the implementation of JREDD initiatives. Some of the advantages of the jurisdictional approaches are: 1) it targets the problem of deforestation at a scale wherein most deforestation drivers

emerge (i.e. the jurisdiction); 2) it minimizes the risks of leakage (where deforestation moves from a protected area to a nearby area); 3) it directly engages all relevant actors in the territory around an overall conservation target; and 4) through careful design of benefit-sharing rules, it can help governments meet development goals such as poverty alleviation.

A jurisdiction is a geographically defined area that is under the management of a given entity or authority with a normative regulation through which a program can be established. Jurisdictions should, in principle, have monitoring capabilities so deforestation rates and the reduction of GHG emissions resulting from the implementation of REDD+ initiatives in their territories are properly measured. A jurisdiction may cover a national territory or a part of it (see for instance Cuellar et al. 2011 and ART TREES 2021). The jurisdiction may intersect with an ecologically homogeneous region that, although not strictly defined by political and administrative boundaries, is recognized by a competent authority, as proposed by the American Carbon Registry (2012).

A key factor in implementing JREDD is the creation of well-defined and locally accepted benefit-sharing rules. For instance, individual projects and national programs may derive benefits in proportion to their actual contribution to emissions reductions. Carbon credits must be converted into real, permanent and verifiable reductions, for which there must be reference levels that determine the GHG emissions that would be generated in the jurisdiction without REDD+ projects. However, dispersed validation and verification processes, across multiple initiatives or projects within a single jurisdiction, can represent high costs if undertaken individually. Consequently, validation and verification of deforestation reduction, and consequently of emissions reductions, is best done on a jurisdictional and broad coverage basis, resulting in significant economies of scale. In this way, the negotiation of payments by results would be done in a centralized manner, developing benefit distribution mechanisms based on the activities developed by each initiative within the jurisdiction and without the need to separate the validation and verification processes.

An important development in the use of jurisdictional approaches in Colombia is the REDD Early Movers - REM Visión Amazonía program, supported by Germany, Norway, and the United Kingdom. Due to its broad coverage of the country's Amazon biome, the broad participation of rural and indigenous communities, the establishment of compensations for forest conservation and the centralized management by the national government, this program is possibly the main predecessor of future JREDD programs. The baseline for the reference period 2001–2012 resulted in an average of 82,883 hectares per year deforested. During the first four years of the payment-for-results period (2013–2016), deforestation levels were below the baseline, with an average of 64,460 deforested hectares per year and 18,423 hectares per year of avoided deforestation. In contrast, in the last year of the payment-for-results period (2017) deforestation increased sharply (largely explained by the signing of the Peace Agreement) and reached 144,152 hectares. As a result, by failing to meet the target set for this past year, payments by results were reduced from the US$100 million initially agreed to US$87 million (Mancala Consultores, 2020). As discussed in the engagement section, it is important to note that this program face important challenges in the development of nesting mechanisms for individual projects.

Several standards applicable to jurisdictional initiatives have emerged, among which the following stand out: The REDD+ Environmental Excellence Standard (TREES 2.0) enforced by The Architecture for REDD+ Transactions (ART); The Jurisdictional and Nested REDD+ (JNR) Framework, enforced by Verra; and the GCF Task Force criteria enforced by Governors'

Climate and Forests Task Force (GCF) for the REDD+ programs. In the modelling pillar of this project, we focus on the TREES 2.0 Standard which is used by the US$1 billion Lowering Emissions by Accelerating Forest finance (LEAF) Coalition (see Table 1 below).

Table 1 ART / TREES 2.0 – Requirements

Eligibility	
Minimum area	2.5 million hectares of forest, unless the jurisdiction is the entire country (*)
Jurisdiction hierarchy	No more than one administrative level below the national level
Relationship with the NDC	The NDC must include forest reductions, although no specific target is required
Activities	
Reduction of deforestation	Required
Reduction of forest degradation	Can be excluded if less than 10%
Removal due to forest increase	Removals may be included if there is reduced deforestation and degradation
Reference level	
Deforestation and degradation	Average emissions for the previous 5 years
Carbon removal by forest enhancement	Average area of new forests during the reference period

**As of 2030 only programs at the national level will be eligible.*

Source: Taken from Econometría Consultores (2022), ART TREES (2021, 2022 and 202b)

4.2 Institutional Design

Several public entities in Colombia have a direct relationship with REDD+ projects and, therefore, would be involved in the development of JREDD in the country[2]. Given this multiplicity of actors in both the public and private sectors and the interactions that need to be established in relation to climate change, it is clear that jurisdictional programs are part of the National System of Climate Change (Sisclima) defined as[3]

> *…the set of policies, standards, processes, state and private entities, resources, plans, strategies, instruments, mechanisms, as well as the information related to climate change, which is applied in an organized manner to manage greenhouse gases and the adaptation to climate change.*

Regarding the implementation of Sisclima, two instruments have been established: 1) national coordination under the responsibility of the Intersectoral Commission on Climate Change (CICC) as the coordinating and guiding body for the implementation of the National Climate Change Policy; 2) Regional Coordination Units in charge of the Climate Change Nodes in each of the country's regions. The CICC is formed by the ministers (exclusively delegated to the

[2] Among these institutions, the following stand out: The Ministry of Environment and Sustainable Development; the National Planning Department (DNP), the Ministry of Agriculture and Rural Development (Minagricultura), the Special Administrative Unit of National Natural Parks (UAEPNN); the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM), the Alexander von Humboldt Biological Resources Research Institute, the Amazon Scientific Research Institute (SINCHI), the Pacific Environmental Research Institute (IIAP), the Marine and Coastal Research Institute (Invemar), the 33 autonomous regional and sustainable development corporations (or local environmental authorities), territorial entities (departments, districts and cities) and environmental authorities in large urban centers. Additionally, there are two major forms of collective ownership of community territories in the country with their respective forms of management and decision-making: indigenous reservations and collective territories of black communities.

[3] Decree 298 of 2016 and Law 1931 of 2018.

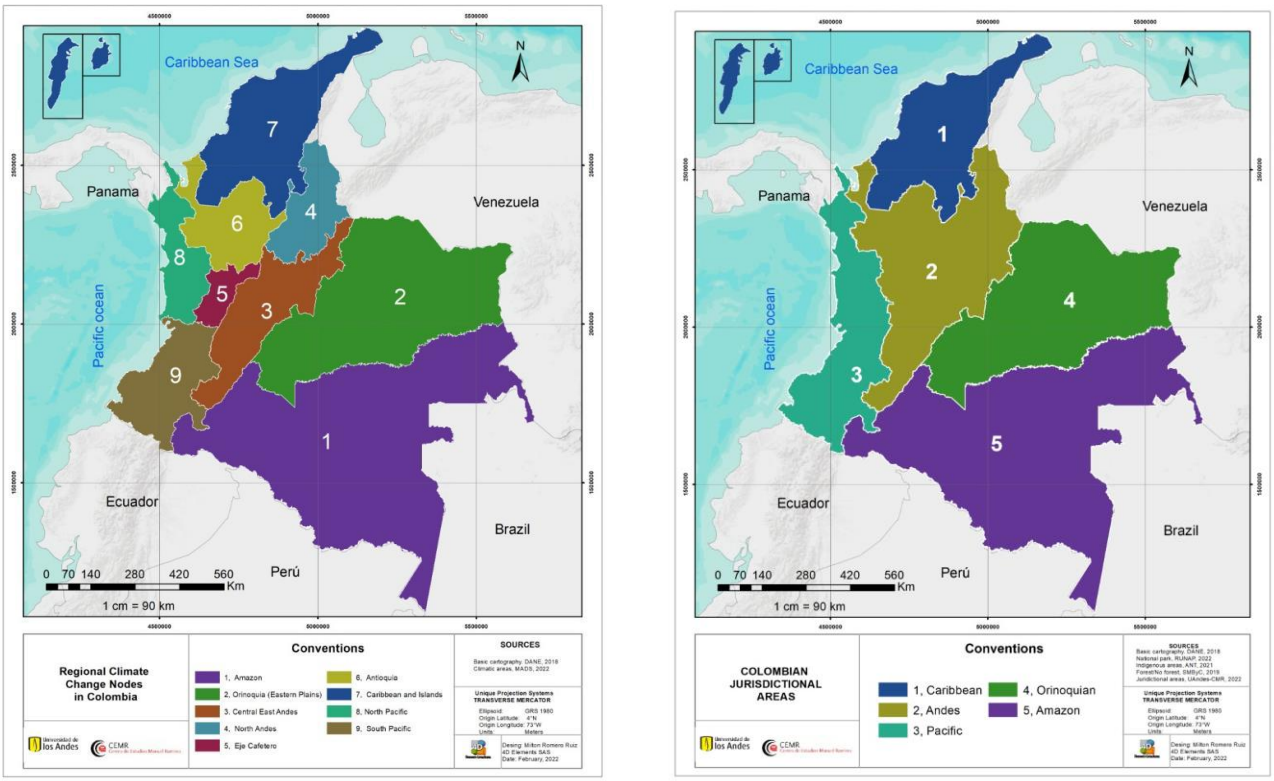
vice-ministers) of Environment and Sustainable Development; Interior, Finance and Public Credit; Agriculture and Rural Development; Mines and Energy; Transportation; Foreign Affairs; Commerce, Industry and Tourism; and Housing, City and Territory, as well as the director (or delegated sub-director) of the National Planning Department (DNP), the National Unit for Disaster Risk Management (UNGRD) and the Adaptation Fund. In this context, the CICC could create a sub-commission to act as a national management body for the jurisdictional programs, made up of delegates from each of these institutions and, eventually, delegates from sectors committed to these programs, such as civil society and local stakeholders (peasants, Indigenous and black communities).

The country has made progress in the creation and consolidation of the nine Regional Climate Change Nodes established in Colombian legislation[4] as bodies responsible for the articulation and coordination of the Sisclima (see Figure 4, left). These Regional Nodes are responsible for promoting, accompanying, and supporting the implementation of climate change policies, strategies, plans, programs, projects, and actions, thereby achieving inter-institutional coordination between central and territorial levels to promote climate change mitigation and adaptation actions. This is in coordination with the processes involved in territorial planning ordering, and integrated risk management. Each Regional Node must elaborate, adopt and execute an Action Plan for the four-year period, articulated with the country's climate change strategies such as the National Climate Change Adaptation Plan (PNACC), the Colombian Low Carbon Development Strategy (ECDBC), the National Strategy for Reducing Emissions from Deforestation and Forest Degradation in Colombia (ENREDD+), the Financial Protection Strategy for Disasters and other strategies defined within Sisclima's framework. The Regional Nodes thus emerge as a natural entity for managing jurisdictional programs.

An aggregation of Regional Nodes consistent with the dominant biomes of the countries is suggested: see Figure 4, right. The five proposed jurisdictions are thus 1) Caribbean region, 2) Andes region, 3) Pacific region, 4) Orinoquía region and 5) Amazon region. All proposed jurisdictions meet the minimum forested area requirement of ART TRESS, that is 2.5 million hectares of standing forests, except from jurisdiction 1.

[4] Decree 298 of 2016 and Law 1931 of 2018.

Figure 4 Regional Climate Change Nodes (left) and Proposed Jurisdictional Programs (right)



4.3 Operational Structure of Proposed Jurisdictional Approach

Our proposal for jurisdictional programs includes three elements: an institutional framework for the programs; an income flow and benefit-sharing rules. Our proposal also includes a nesting mechanism that is described in detail in the Engagement Report. In institutional terms, two levels of management are proposed for the operation of jurisdictional programs: a National Board of Directors, centralized and in charge of the general management of the set of jurisdictional programs that are formed; and in each jurisdiction of the program, a Jurisdictional Board of Directors with its respective Jurisdictional Operating Unit (see Figure 5). To oversight the management of all jurisdictional programs, a high-level National Board of Directors is proposed, composed of members with decision-making capacity and representing: the National Government, represented by ministers and with the delegation to vice-ministers; each of the directors of the jurisdictional programs; and representatives of civil society and local communities. Some of the tasks of the National Board of Directors include: defining the general rules for jurisdictional programs, developing mechanisms for the application of these results, ensuring the overall governance of the system, designing monitoring, reporting, and verification mechanisms, and designing a system of payments to those partners implementing conservation actions.

Figure 5 Institutional framework of Jurisdictional Programs

NATIONAL BOARD OF DIRECTORS	JURISDICTIONAL BOARD OF DIRECTORS
• National Government • Jurisdictional programs • Local authorities • Civil society & local communities	• National Government • Regional environmental authorities • Local authorities (departments & municipalities) • Indigenous / Peasants & Ranchers/ Local
• Program Rules • Implementation and governance • Enabling conditions & operation • MRV rules & guidelines • Local capacity development policy • Benefit sharing across jurisdictions • Payment system design • Execute monetary & in-kind payments	• Jurisdictional Operative Unit • Operation design • Local activities Validation, Verification and Monitoring reporting of the jurisdictional program to the National Board of Directors • Institutional agreements with the private sector and local communities • Building capacity and technology transfer

Source: Own elaboration.

Each Jurisdictional Board of Directors, together with its respective Operational Unit, shall assume some of the following functions: to design the program's operating systems within its jurisdiction, to oversight the program's operation and prepare the corresponding reports to the National Board of Directors, to formalize the required agreements with institutions, implementing partners, and local communities, and to assist in the development of the capacities of the relevant actors within the corresponding jurisdiction.

4.4. Financial Sources and Benefit Sharing

Jurisdictional programs must ensure adequate and sustainable resources to cover the costs of the activities required to achieve overall conservation objectives. In this regard, we have identified at least three potential sources of income for a jurisdictional program (see Figure 6):

- National Budget (key in providing seed funding to generate credits).
- Carbon tax and/or PNCTE.
- International Results-based Payments, including the LEAF Coalition.

While resources from the National Budget can provide initial funding for jurisdictions to undertake actions that lead to reductions in deforestation levels, the resulting carbon credits may be sold in national and international markets. As mentioned earlier, the offset mechanism of the Colombian carbon tax has initiated an active carbon market using project-level offsets. This experience could be used to establish high-integrity jurisdictional programs. As explained in the introduction, the country´s Climate Law (Law 1931 of 2018) explicitly states that the PNCTE can grant tradable quotas to non-regulated actors, either private or public (e.g., forest jurisdictions) that voluntarily implement initiatives that reduce or remove greenhouse gas emissions (e.g. reduced deforestation). This quota allocation is conditioned on emissions reductions being previously verified, certified, and registered in a national registry. These quotas may then be sold to regulated actors, typically, local private companies. Forest jurisdictions can thus become active actors in the local carbon markets and can potentially help

the country cost-effectively meet its mitigation targets. As mentioned earlier, an international demand exists for high-integrity forest offsets. If the jurisdictions that reduce deforestation meet the requirements set by international standards, such as the ART TREES standard (see Table 1), these credits could also be sold in international markets to, for instance, the LEAF Coalition.

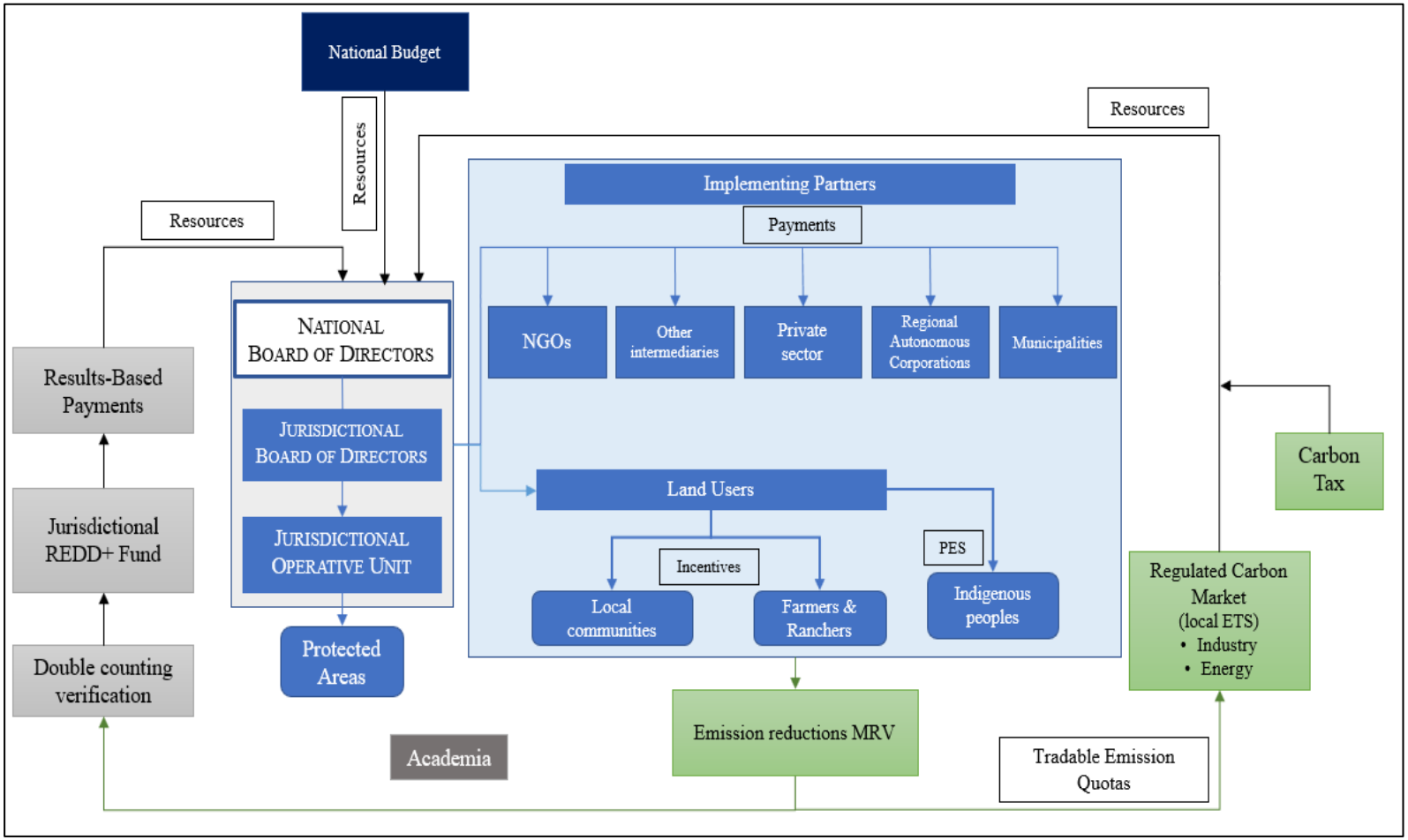
The design of the distribution of benefits is a key aspect of a JREDD program. The entire operation and its effectiveness depend on how payments are distributed to compensate for the opportunity costs of land use changes among institutions, implementers, stakeholders, communities, indigenous peoples, and households. The system for sharing benefits determines not only the proportion of payments for emissions reductions but also the governance architecture and political representation of the different actors involved in preventing deforestation, as proposed by IUCN (2009), WWF (2021) and Zúñiga and Deschamps (2014). Concerning both the generation of resources and the distribution of benefits, a key aspect is the definition of clear rules to establish the baseline and measure mitigation results. In this regard, it remains to be defined the relationship that may exist between a general baseline established by the country for the analysis of deforestation, with the different standards that may appear as established by a particular resource contributor.

In Colombia, deforestation activities are mainly driven by land clearing (for occupation, transformation to pasture and timber commercialization), irregular infrastructure development, expansion of agricultural activities, extensive cattle ranching, illicit crops, illegal logging, and illegal mining, while Indigenous peoples lead conservation activities and as required by protected areas. A common problem associated with the participation of key actors and interested parties in individual REDD+ projects is that these actors tend to be treated as beneficiaries rather than partners. As a result, local communities and interested parties perceive that the design of incentives, local capacity, delivery mechanisms, transparency provisions and the distribution itself are not entirely fair. In addition, Indigenous peoples are demanding that a benefit-sharing system should provide greater payments for their role in conservation rather than providing greater benefits to those who deforest.

Including different types of funds implies two dimensions of architecture in the benefit-sharing system: a vertical and a horizontal distribution. A vertical approach uses a national voluntary and regulated market fund (ETS) to distribute benefits among national and subnational governments, non-governmental actors, intermediaries, NGOs, and facilitators. These transactions are carried out to ensure the operability of the program. On the other hand, the horizontal architecture seeks to distribute the remaining benefits as incentive payments among and within communities, households, and local stakeholders (see Figure 6)[5].

[5] See UICN (2009), Leining & Kerr (2018) and Lindhjem et al. (2010).

Figure 6 A proposal of JREDD funding sources, flow of resources and distribution of benefits



Source: Own elaboration.

Given the scale of a jurisdictional REDD+ program, it is clear that the interaction and negotiation between local actors, institutions, intermediaries and current individual REDD+ projects are essential. Therefore, a fair design of benefit sharing, both vertical and horizontal, must guarantee the bargaining power of the actors involved in deforestation and conservation activities. In this regard, national and subnational agreements should be established to achieve at least the following four main objectives:

1) Provide effective monetary and non-monetary incentives that change land uses and reduce emissions from deforestation
2) Contribute towards building legitimacy through a fair and equitable distribution of resources, responsibilities and bargaining power
3) Identify and select the minimum number of intermediaries that will ensure an optimal program operation and maximize the benefits received by local stakeholders
4) Include local actors in the decision-making process and recognize them as partners rather than beneficiaries.

These objectives must be carefully balanced, as they imply a compromise in terms of resource allocation and representativeness of local communities and interested parties directly involved in forests. In this sense, alternatives for a benefit distribution system for each jurisdictional REDD+ program for Colombia are proposed as illustrated in Figure 6.

5. MODELLING

5.1. Modelling Approach

Using existing Marginal Abatement Cost Curves (MAC) estimates for the regulated sector (energy and industry) and the unregulated sectors (forestry) in Colombia, the modelling pillar of the project examines how JREDD in the country may perform in terms of emissions reductions and funding flows. Four simulation scenarios are analyzed. To the extent that seed funding is required to reduce deforestation at the jurisdictional level, for each scenario we calculate the initial financing from the National Budget required to generate financial flows that enable the country to meet its forestry goals as established in the NDC. We study four scenarios:

Table 2 Potential Funding Sources for JREDD in Colombia and Modelling Scenarios

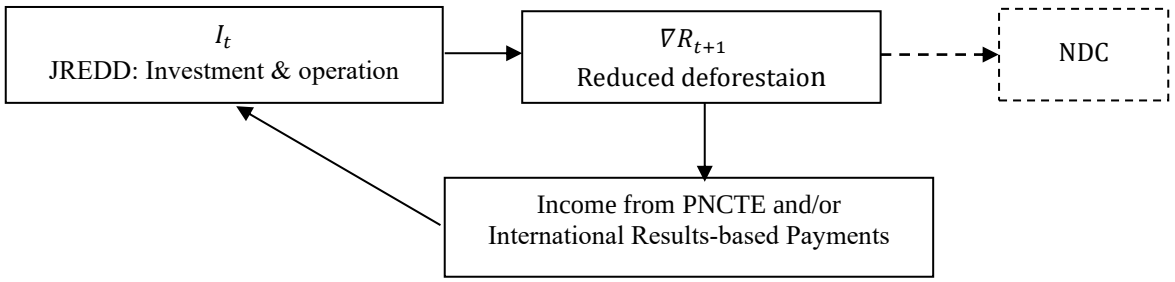
		Transfers from the PNCTE	
		No	Yes
International Results-based Payments	No	Scenario 1	Scenario 2
	Yes	Scenario 3	Scenario 4

Seed funding from the National Budget is calculated for all scenarios
Source: Own elaboration

Figure 7 shows how a jurisdictional approach may harness national and international financial sources. In order for a jurisdiction to reduce deforestation levels and generate carbon credits in a given period (t) costly conservation actions must be undertaken in the previous period $(t-1)$. Carbon credits may be transferred to the PNCTE and/or to an international buyer. Thus, stacking payments from these sources is, in principle, allowed. Reduced emissions will

contribute to the country´s NDC, unless a corresponding adjustment to it is agreed with the buyer of the carbon credits in the international market. The income received by the jurisdiction from the PNCTE and/or International Results-based Payment scheme in a given period can be reinvested to generate further reductions in deforestation that can then be sold in international markets. A virtuous cycle may be created, and the economic sustainability of the jurisdictional approach may be ensured (see Figure 7).

Figure 7 JREDD: Period-to-period Interaction, Emissions Reductions, and Finance



The analysis is carried out over seven periods or years, specifically for the 2024–2030 period.

5.1.1 Linking JREDD with PNCTE

Given their mission objectives, several public entities have a direct relationship with REDD+ In an ETS or Cap-and-Trade Program like the PNCTE, the environmental authority sets a limit or cap on total emissions a given year in a given area. It then issues an emission allowance equal to the level of the cap and allocates them among the regulated agents, typically in an auction. This auction is referred to as the primary market. Companies are free to trade allowances among themselves for a given compliance period. At the end of the compliance period, allowances are handed over to the Government to back their emissions. Companies with lower reduction costs are expected to sell their emission rights to companies with higher reduction costs in the secondary market. In general, emissions reductions are theoretically achieved at the lowest cost. To determine the cap, the simplest method is to project the emissions pathway of the regulated sectors, namely energy, and industry, assuming a Business-as-Usual scenario. Once the projection up to 2030 is available, the emissions target can be calculated, which in the Colombian case is defined as 51% of the projected emissions in that same year.

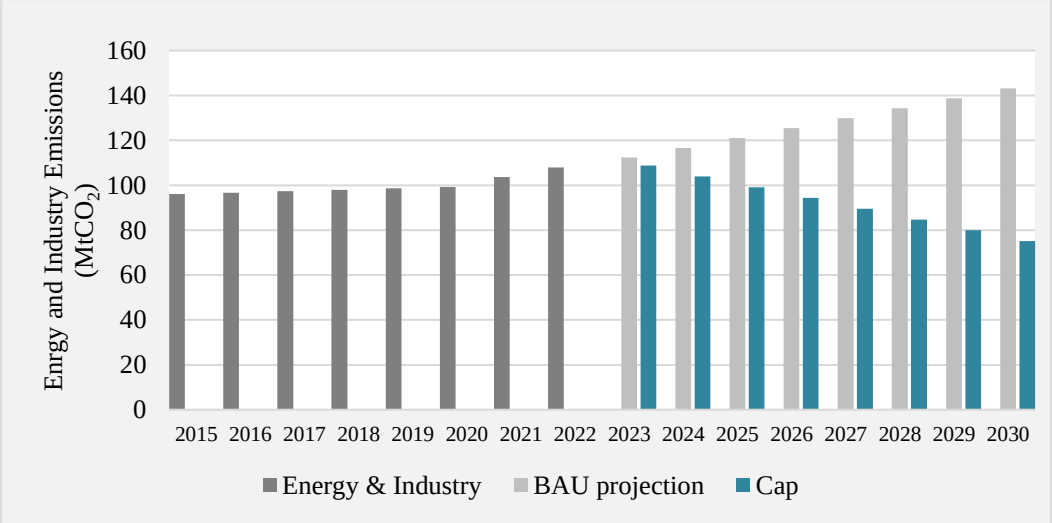
As mentioned in the introduction, Colombia faces a major mitigation policy challenge as the AFOLU sector accounts for 59% of total emissions but is largely unregulated. The country has sought alternatives to circumvent this challenge by creating offset mechanisms that enable regulated sources to compensate their emissions through actions undertaken in unregulated sectors such as forestry. As mentioned earlier, the PNCTE contemplates granting emissions allowances or tradable quotas to non-regulated public or private actors that voluntarily implement initiatives to reduce or remove GHG emissions, such as a jurisdiction (Law 1931 of 2018). This quota allocation is conditioned on emissions reductions being previously verified, certified, and registered in a national registry. These quotas could be sold in the auction or in the secondary market. In the former case, the national Government will collect the financial resources and will then transfer them to the jurisdictions that have already certified emissions

reductions. In the latter case, jurisdictions may sell the quotas that the Government granted them according to their emissions reductions to regulated sources. The national government may also choose to allocate some resources from the general auction to fund jurisdictional programs. In this project we assume that 20% of the quotas issue each year by the regulator are allocated to the non-regulated sector or the jurisdictions.

5.1.2 Funding from PNCET

The sectors considered in the model are a regulated sector, i.e., energy and industry, and an unregulated sector, i.e., forestry. For each sector type, existing estimates of MAC curves were used. For the regulated and unregulated sectors, estimates from Uniandes (2014) and CEMR (2021) were used respectively. The CEMR study provide estimates of regional MACs according to the five regions considered in this study. When the emissions cap is set for the regulated sector in a given period (see Figure 8), the MAC gives the price of the PNCTE auction for that year (see Figure 9).

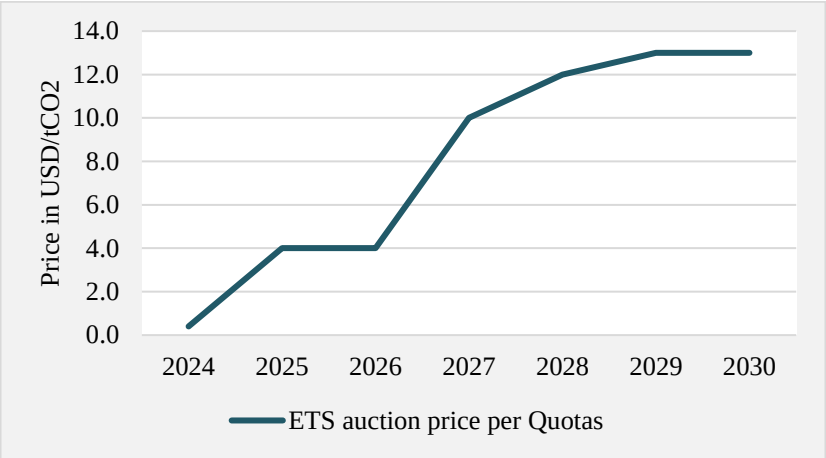
Figure 8 Projection of the Cap on Emissions



Source: Own projections based on IDEAM and others. (2021)

During the initial years of the PNCET, the quota price is very low. We thus propose to establish a floor price for the auction, which is equivalent to the value of the carbon tax in the corresponding period. The quota price helps determine the number of financial resources that will be allocated to the unregulated sources or JREDD programs. Recall that it has been assumed that 20% of total allowances will be allocated to the unregulated actors that have certified emissions reductions. We assume that when these resources are available the Government will allocate them among jurisdictions that have achieved emissions reductions in the previous year. Using the National Level of Forest Emission (NREF) as a baseline, the allocation mechanism compensates first emissions reductions that were achieved at the lowest cost and then moves to compensate slightly more expensive emissions reductions, and so forth.

Figure 9 PNCET Quota Price Trajectory



Source: Own calculations

5.1.3 Funding from International Results-based Payments

These results-based payment agreements programs consider a specific reference or baseline level of emissions from deforestation in the jurisdiction, where emissions below this level are credited as effective reductions for result-based payments. Generally, this baseline is defined by program standards as the average emissions from net deforestation over a prior period to the implementation agreement. In this way, program standards recognize effective emissions reductions only when emissions are below the reference level for result-based payments. For this model, the reference level of the ART TREES standard is used to credit a jurisdiction's agreement for five years, which corresponds to the average deforestation for the five years prior to the beginning of the program. Assuming that the jurisdictional program starts in 2024, it is estimated that the reference level for crediting the period between 2024 and 2028 has an approximate value of 100.7 $MtCo_2$. Now, to calculate the reference level for the remaining years of the study period, 2029 and 2030, the reference level is recalculated according to the results obtained by the model simulation in the previous five-year period. We assume that the price of these credits is US$10/ton$CO_2$ as some general guidelines indicate, although a higher price may be agreed between sellers and buyers. Additionally, it is necessary to consider in the model that jurisdictional carbon standards have rules associated with reducing the uncertainty of monitoring and verification processes of emissions reductions, which imply a discount on recognizable reductions of each period. For this model, a discount factor of 0.7 was assumed.

The objective of the jurisdictional programs is to help the country meet its NDC targets, so the host country may maintain ownership of carbon credits. In this case, the emissions from the country´s NDC deforestation target is defined for the year 2030 (that is a deforestation target of 50,000 hectares that year) and an annual trajectory of the emissions was constructed. Once the emissions reductions exceed the forest sector's NDC target reductions, the surplus could be offered on the international voluntary market. Credits sold in this market would grant ownership of the credits for a higher price, and would imply a corresponding adjustment in the country's carbon accounting. In other words, these credits cannot be accounted for the country's NDC, but their sale would function as an additional source of financing for forest emissions reduction activities. For the purposes of the model simulations, an increasing price between US$28/ton$CO_2$ and US$40/ton$CO_2$ was considered.

5.1.3 Benefit Sharing

Each jurisdiction ought to define its benefit-sharing plan following the national policies and guidelines defined in this regard, but agreeing and planning the specific aspects of this distribution in a participatory manner. These benefit-sharing decisions are often based on legal factors (land and resource ownership), stakeholder priorities and other negotiated agreements between indigenous peoples, local communities and/or other stakeholders. A broad classification of benefits is presented below:

- Payments for the development of REDD+ projects.
- Payments to local stakeholders (producers and communities) that require an incentive or economic support to transform their land use.
- Payments for Indigenous communities related to historical and future forest conservation.

We assume a relative stable income stream for Indigenous communities thought the period of analysis while payment for REDD+ project developers, producers and communities will depend on abatement effort exerted.

5.2. Key Modelling Results

The main results of the modelling exercise shows that the seed funding from the National Budget required to meet the country´s forest NDC goals drops considerably as funding from other sources is harnessed through the implementation of JREDD (see Table 3). In particular when JREDD is linked to the PNCTE and/or International Results-based Payments such as those offered by the LEAF Coalition, the public funding needed to achieve the NDC deforestation target of 50,000 hectares in 2030 is ten times lower when compared with the scenario where only Government funding is used.

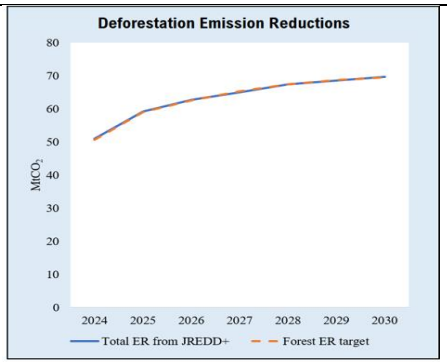
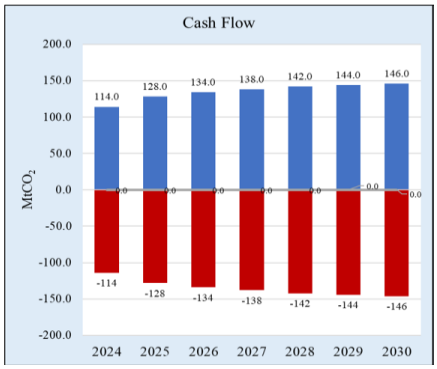
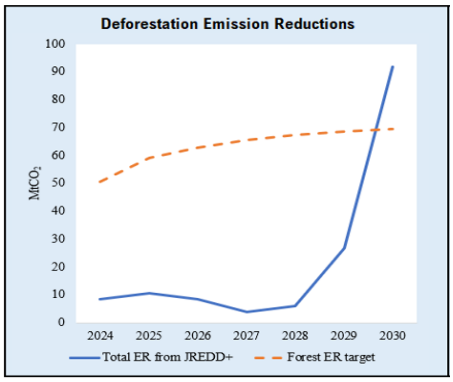
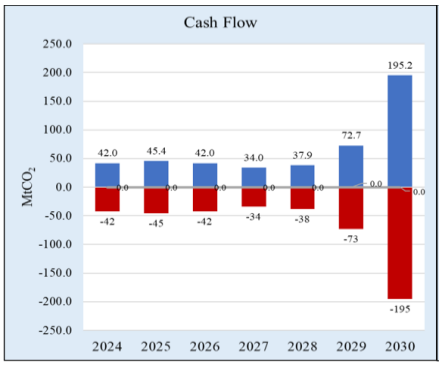
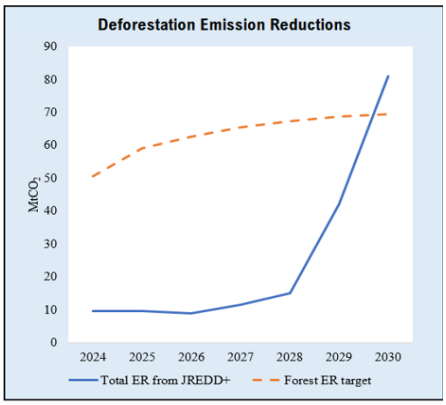
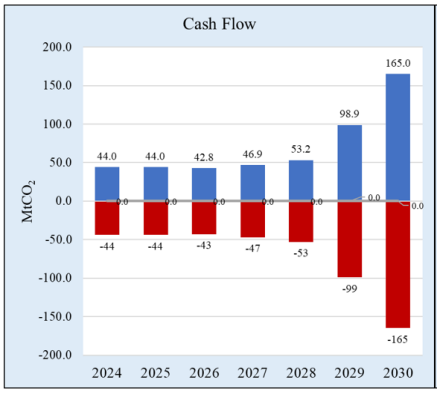
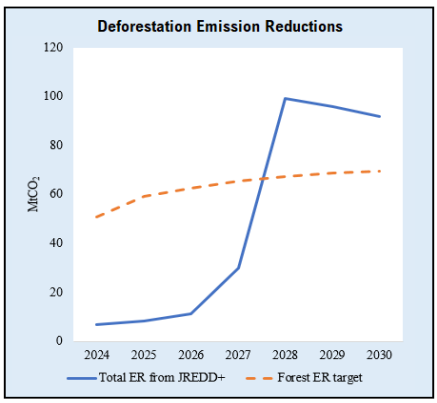
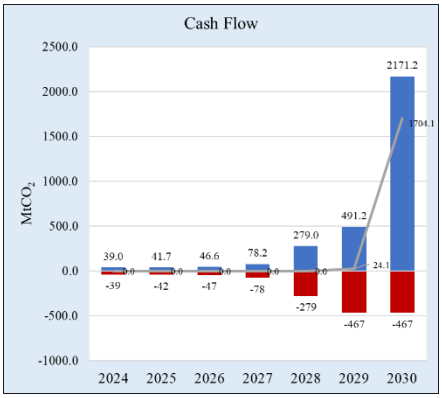
Table 3 Funding from the National Budget Required to Meet Colombia´s Forest NDC Goals under Different Scenarios

		Transfers from the PNCTE	
		No	Yes
International Results-based Payments	No	US$900 million	US$84 million
	Yes	US$88 million	US$75 million *

** Under this scenario the country reaches its forest NDC goal before 2029 and it receives extra international funds. Slight increases in National Budget allocated to JREDD leads to early achievement of the country´s NDC goals (see Table 4).*
Source: Own elaboration

Table 4 presents emissions reductions and income received by the jurisdictions over time. As more external funding sources are leveraged the forest target is achieve at a faster rate,

Table 4 Emissions Reductions and Cash Flows

Government funding (USD millions)	Reduction of emissions caused by deforestation	Cash flow
Scenario 1 Initial budget US$946 million		
Scenario 2 Initial budget US$84 million		
Scenario 3 Initial budget US$88 million		
Sensitivity Analysis: Scenario 4 Initial budget US$78 million		

As an example of some of the outputs obtained from model runs, we present the outputs from scenario 3 where mitigation activities are financed by payments for results or international carbon markets, but there is no PNCTE resource flows. Emissions reductions, total revenue, and revenue to Indigenous communities per jurisdiction are shown in tables 5a, 5b and 5c. We assume a stable income stream for ethnic communities throughout the period of analysis.

Table 5a JREDD Emissions Reductions by Jurisdiction $MtCO_2$ in Scenario 3

Year	Amazon	Orinoquía	Pacific	Caribbean	Andean	Total
2024	7,47	0,69	0,05	1,45	0,00	9,66
2025	7,47	0,69	0,05	1,45	0,00	9,66
2026	6,69	0,69	0,05	1,45	0,00	8,88
2027	9,10	0,69	0,05	1,45	0,00	11,29
2028	12,32	0,69	0,05	1,45	0,00	14,52
2029	39,25	0,69	0,05	1,45	0,00	41,44
2030	75,29	0,69	0,05	1,45	0,00	77,48

Table 5b Revenue of Ethnic Communities by Jurisdiction in Scenario 3 (US$ millions)

Year	Amazon	Orinoquía	Pacific	Caribbean	Andean	Total
2024	20,00	2,63	5,73	0,25	0,64	29,24
2025	20,00	2,63	5,73	0,25	0,64	29,24
2026	20,00	2,63	5,73	0,25	0,64	29,24
2027	20,00	2,63	5,73	0,25	0,64	29,24
2028	20,00	2,63	5,73	0,25	0,64	29,24
2029	20,00	2,63	5,73	0,25	0,64	29,24
2030	20,00	2,63	5,73	0,25	0,64	29,24

Table 5c Total Revenue by Jurisdiction in Scenario 3 (US$ millions)

Year	Amazon	Orinoquía	Pacific	Caribbean	Andean	Total
2024	32,59	3,62	5,75	1,40	0,64	44,00
2025	32,59	3,62	5,75	1,40	0,64	44,00
2026	31,26	3,62	5,75	1,40	0,64	42,68
2027	35,35	3,62	5,75	1,40	0,64	46,76
2028	40,83	3,62	5,75	1,40	0,64	52,24
2029	86,55	3,62	5,75	1,40	0,64	97,96
2030	147,75	3,62	5,75	1,40	0,64	159,16

Source: Developed by Uniandes-EDF-CEMR based on the financial simulation model

Stable payments for ethnic groups require that, at a minimum, funding mechanisms have the capacity to generate these resources and more in order to achieve greater mitigation results. This helps to buffer the risks of fluctuations in the income of Indigenous communities but requires higher initial funding conditions. If Indigenous revenues were a proportion of total costs, the initial requirements would be lower but there would be no guarantee of resources for these communities.

The model assumes that JREDD programs have operations designed to ensure efficient emissions mitigation, the incorporation of safeguards, such as environmental education and awareness measures, and the minimization and/or compensation of potential adverse socio-environmental impacts of such interventions. It has also been assumed that transaction costs remain low. The model presented here is highly stylized and does not consider all impact of the interventions, positive and negative, in the territory.

6. CONCLUSIONS

Colombia's tropical forests are rapidly receding and face serious threats. In 2021, the country lost 174,103 hectares of forests, a 1.5% increase from the previous year, with most deforestation occurring in the Amazon region. On the other hand, JREDD programs are receiving growing attention as a promising method to deliver high integrity, large-scale avoided deforestation. Unlike project-based initiatives, JREDD involves designing and implementing policies and institutions that seek large-scale changes in the economic development model at the regional level.

This study aimed to identify inclusive and equitable ways to integrate JREDD into Colombia's climate mitigation policies. We established three parallel and interconnected pillars: first, we focused on engagement with key stakeholders. Second, we prepared a policy design that government can use as a guideline to integrate these approaches. Third, we constructed a model to illustrate how JREDD may help Colombia meet its NDC target while benefiting local communities.

Stakeholders demand a significant role in negotiating the benefit-sharing system to build a JREDD program in Colombia. To achieve this, national and subnational agreements should be established with at least three main objectives in mind: 1) provide effective monetary and non-monetary incentives; 2) contribute towards building legitimacy through a fair and equitable distribution of resources, responsibilities, and bargaining power; and 3) include local actors in the decision-making process and recognize them as partners rather than beneficiaries. To ensure representativeness, bargaining power, effective resource administration, and a fair distribution of benefits, we propose an internal administrative division of Colombia into five jurisdictions: 1) Caribbean region; 2) Andean region; 3) Pacific region; 4) Orinoquía region; and 5) Amazon region.

An important policy proposal is to create a National Board of Directors that oversees the overall functioning of JREDD in the country and to create Jurisdictional Boards of Directors composed of representatives from the five jurisdictions to guarantee the representativity and bargaining power of the different actors. The main results of the modeling exercise shows that the seed funding from the National Budget to meet the country's forest NDC goals drops considerably as funding from other sources is harnessed through the implementation of JREDD. In particular, linking JREDD with the PNCTE and with International Results-based Payments such as those provided by the LEAF Coalition enables Colombia to achieve its NDC cost-effectively.

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