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COLOMBIA LAND FOR PROSPERITY— SOUTHERN META AND THE VICINITY OF CHIRIBIQUETE NATIONAL PARK

IMPACT & PERFORMANCE EVALUATION DESIGN REPORT

CONTENTS

ACRONYMS

ANT	Agency Nacional de Tierras (tr.: National Land Agency)
CNP	Chiribiquete National Park
DID	Difference-in-differences
DRG	Center for Democracy, Human Rights, and Governance
EQ	Evaluation question
ET	Evaluation team
FA	Feasibility assessment
FARC	Fuerzas Armadas Revolucionarias de Colombia (tr.: Revolutionary Armed Forces of Colombia)
FGD	Focus group discussion
GoC	Government of Colombia
IE	Impact evaluation
IP	Implementing partner
IRB	Institutional Review Board
LfP	Land for Prosperity
MADS	Ministry of Environment and Sustainable Development
MLO	Municipal Land Office
PDET	Territorially Focused Economic Development Plan (tr.: *Plan de Desarrollo con Enfoque Territorial*)
PE	Performance evaluation
PNIS	National Program for the Substitution of Illicit Crops
PNN	Unidad Administrativa Especial del Sistema de Parques Nacionales Naturales de Colombia (tr.: National Natural Parks Unit)
PPP	Public-private partnership
RLO	Regional Land Office
SMVC	Southern Meta and the Vicinity of Chiribiquete National Park
SRD	Spatial regression discontinuity
SSI	Semi-structured interview
ToC	Theory of change
USAID	United States Agency for International Development

1. BACKGROUND

This document outlines the approach to the Land for Prosperity (LfP) Southern Meta and the Vicinity of Chiribiquete National Park (SMVC) evaluation recommended by the Cloudburst evaluation team (ET), including research questions, research methodology, analytical framework, sampling strategy, analysis plan, and detailed timeline for data collection. The ET wrote this evaluation design report in November 2022; it builds upon the feasibility study previously conducted by NORC and background sections from the NORC feasibility assessment (FA; Albornoz et al., 2022).

As a mixed impact and performance evaluation, the evaluation design outlined here fulfills some of the basic quality elements of an impact evaluation (IE) outlined in United States Agency for International Development's (USAID's) 2020 report *Assessing the Quality of Impact Evaluations at USAID*. In terms of conceptual framing, the design presents the purpose and intended use of the evaluation, evaluation questions (EQs), and theory of change (ToC). These are supported with a literature review, are appropriate to the local context, and speak to evaluation hypotheses (second-tier elements). The treatment is described in detail, and this report includes outcome measures, sample size, data collection methods, and data analysis methods. The final analysis will include the statistical significance of impact estimates and recommendations closely connected to findings, which will address the practical significance of the findings.

1.1. MOTIVATION

This study is focused on the SMVC geographic region. This includes four national parks, one national nature reserve, and the surrounding Amazon Forest Reserve Zone.

There are a number of drivers of deforestation in and around these environmentally protected territories including land grabbing, cattle ranching, licit and illicit crop cultivation, timber extraction, wildlife trafficking, gold mining, and others (Albornoz et al., 2022). Among these, a complex inter-linkage between cattle grazing, coca leaf production, and land grabbing is driving a significant amount of forest clearing (Castro-Nunez et al., 2017). Specifically, cattle grazing is the main driver of deforestation in the study area, as protected areas are deforested and burned to promote grass for cows to graze and people are paid to log and raise cattle in these areas. Cattle ranching is appearing in areas where alternative livelihoods have failed. Reports indicate significant corruption in the paperwork to get cattle and timber into the legal supply chain and in the security forces (International Crisis Group, 2021).

A number of studies have documented increased rates of deforestation following the 2016 peace accord, including in territories previously controlled by the Revolutionary Armed Forces of Colombia (FARC). This is due to a governance vacuum left by the FARC; to protect the canopy that provided security for location and movement during the conflict, FARC rebels had a system of resource management in place to mitigate cutting woodland and clearing jungles. With the end of FARC control of these areas, a number of groups now contribute to deforestation, although everyone's role in the process is different. These actors include right-wing paramilitary groups, FARC dissidents (i.e., former fighters who have reneged on the peace process and returned to arms), criminal groups, smallholder and landless farmers, and internally displaced people along with conflict victims. FARC dissidents retain control over a large part of the study area for this evaluation. Insurgents and criminal groups use the income from the economic activities on cleared land to fund criminal activity. Impoverished local residents provide labor to support land clearing for cattle ranching and illicit crop cultivation. Crime rings displace rural families and force them to clear

and settle land for planting coca. Although the compensation varies by location, coca cultivation provides many families with a viable livelihood opportunity. All of this is compounded by corruption through bribes to law enforcement officials, information leaks, and manipulations of judicial investigations; prominent public and political figures are involved in financing illegal land clearing, including through engagement in activities such as illegal cattle ranching (International Crisis Group, 2021).

As part of the 2016 peace accords—and after—a number of environmental laws and policies were adopted or pursued that focus on property rights, access to land, land restitution, crop substitution from coca farming, rural development, and security campaigns. With regards to land and property rights, the 2016 peace accord includes a number of provisions to support land formalization including for use rights, access to land, and resource governance; improved land management through the implementation of a multipurpose cadastre was central to the peace accord commitments. In addition, an Environmental Zoning Plan (Plan de Zonificación Ambiental) was designed to designate protected areas and manage land use in areas with specific environmental characteristics. Territorially Focused Economic Development Plans (PDETs) are local development plans that include a plan to shift cultivation from coca farming. There are also key provisions for the expansion of existing Campesino Reserve Zones where unused or inefficiently used land is reallocated to small-holders with the objective of promoting more productive and sustainable ownership. One of the first tasks of these zones is to formalize and regularize the property. In addition to this, the 011 Victims' Law established a land fund for restitution of displaced persons.

Other initiatives include Visión Amazónica, Operation Artemisa, and the 2021 Environmental Crimes Law. Visión Amazónica is a key international cooperation initiative that started in 2016 with the purpose of avoiding deforestation through sustainable development programs. Operation Artemisa was a military campaign to prosecute illegal activities in the Amazon, which intended to allocate land for restoration and reduce environmental crime, in part through the deployment of security officers and coca crop eradication. Additionally, the July 2021 Environmental Crimes Law provides a comprehensive penal framework for deforestation, wildlife trafficking, and pollution.

Overall, implementation of several environmental and property rights measures has been slow. According to the International Crisis Group, as of early 2021, only approximately 15 percent of land (nationally) is in the Land Registry; most arable land is occupied—although not in the registry—and it remains difficult to establish rightful ownership of land. Finally, although coca production in this study area represents less than 4 percent of the national total, many reports indicate that given the stable income provided through coca farming, many alternative livelihood programs are failing to provide sufficient incentives to promote a switch from growing coca. The reasons and lessons learned for failing substitution programs might be transferable to efforts to promote a switch from cattle grazing, which represents are larger threat to forests in the study area covered by this evaluation (International Crisis Group, 2021).

1.2. LITERATURE REVIEW

There is a small but growing body of rigorous IEs on the effect of conservation policies and programs centered on natural climate solutions, such as payment for ecosystem services, protected areas, land titling, and forest restoration. In addition to natural climate solutions interventions, conservation organizations have made significant investments in alternative livelihoods and resource protection to incentivize behavioral changes to improve conservation and reduce threats to biodiversity. For these interventions, and across the spectrum of conservation interventions, rigorous evidence on well-being and biodiversity is lacking from the current body of evidence.

Conservation employs a variety of interventions, usually implemented as a suite that spans three levels in line with the Conservation Measures Partnership taxonomy of conservation actions: 1) interventions to improve the enabling environment for conservation, 2) interventions to change behavior/mitigate the threat, and 3) actions to relieve direct stress on species and ecosystems through land/water and species management (Faust et al., 2022). Common USAID interventions include protected area management, conservation enterprises, law enforcement, demand reduction/behavior change campaigns, and strengthening enabling environments (legal/policy reform, conservation planning, education/training, institution strengthening), as well as more innovative market-based and direct economic payment schemes. Meta-analyses of IEs, which measure the causal impact of programs, have unsurprisingly not identified a silver-bullet strategy for ensuring conservation outcomes (Börner et al., 2020). Conservation programs typically include a bundle of interventions not easily disentangled, such as resource protection, habitat maintenance, and alternative animal-sourced foods.

There is significant variation in the rigor of studies about the effectiveness of conservation programming. Many studies on the effectiveness of conservation strategies involve simple monitoring of indicators or case studies (Ferraro and Pattanayak, 2006). To date, IEs are rare in conservation science; there are limited counterfactual-based studies that evaluate intervention effectiveness, and many are subject to a poor research design (Ribas et al., 2020; Burivalova et al., 2019). This is especially true for efforts to assess the effects of programming on both conservation and poverty reduction, with limited and methodologically weak efforts to assess poverty outcomes relative to measuring forest conditions (Samii et al., 2015). Strong evidence has a patchy geographic distribution, and many studies lack long-term outcome measurements and/or focus on only a single outcome—forest cover change. Conservation programs have been biased toward locations facing relatively low threat levels and, by design, with high biodiversity value (Joppa and Pfaff, 2009). This is problematic for understanding impacts in partially degraded landscapes with dynamic land-use change. It also indicates the opportunity to find larger conservation impacts in areas facing more degradation and deforestation pressures.

Although biodiversity outcomes remain significantly understudied, over the past ten years, the rigor of conservation evaluations to measure forest cover change has significantly improved (Baylis et al., 2016). This includes the increasing use of statistical matching techniques as a correction for selection bias, which occurs when there are pre-existing, systematic differences between participants and non-participants that introduce bias into study designs. However, more rigorous study designs such as matching combined with difference-in-differences (DID) (which estimates impact by comparing changes in outcomes among program participants with changes in outcomes among non-participants), synthetic controls (which construct a weighted average of potential comparison units that best resembles the treated units), and randomized control trials (which use random assignment to ensure that those assigned to participate in the program are, on average, the same as those who are not) remain limited (Börner et al., 2020).

Counterfactual/causal studies have not been prioritized in the conservation space relative to other development sectors. Several challenges have been raised about conducting rigorous research for this sector. These center around concerns that measuring impacts on biodiversity and conservation are methodologically challenging and expensive (Ferraro, 2009; Rissman and Smail, 2015). Specifically, challenges include: a historical legacy of prior interventions; purposeful selection of treatment areas; hard-to-identify comparison areas; large variability in ecological outcomes; long time lags between intervention and ecological response; programs with multiple interventions; external validity from one context to another; complex spillover effects (e.g., forest use, species movement); large spatial scales of

environmental processes; and data constraints, including a heavy reliance on self-reported behavioral indicators.

Of particular concern is the number of challenges to collecting biodiversity data and indicators in the context of counterfactual designs. This generally relates to difficulties in finding valid control sites and the high costs for collecting a sufficiently large sample of biodiversity outcomes. Many studies have noted that biodiversity is difficult to measure in the context of a statistically robust approach, especially an approach that would be viable to use biodiversity as an impact measure in the context of an IE (Persha and Bui, 2021; Meijaard et al., 2021). Population trends pre- and post-intervention for selected species across a sample of forests that receive the program and a similar enough sample of comparison forests without the program are required. Fundamentally, measuring biodiversity is a costly data problem, as it is time intensive and expensive to measure biodiversity through standard methods such as transect sampling and netting. Current data sources that provide measures of forest extent, deforestation, and land cover change do not necessarily provide good proxies for biodiversity measures, as forest cover does not indicate the presence/absence or diversity of species, poaching, etc. (Burivalova et al., 2019). Additionally, global and publicly available remotely sensed spatial data does not enable the direct measure of local biodiversity at a site or "micro-level" for most species, even if available at a high frequency (Hill et al., 2019).

Despite these challenges, although biodiversity outcomes remain significantly understudied, over the past ten years, the rigor of conservation evaluations to measure forest cover change has significantly improved (Baylis et al., 2016). This includes the increasing use of statistical matching techniques as a correction for selection bias, although stronger designs such as matching combined with DID, synthetic controls, and RCTs remain limited (Börner et al., 2020}. Indeed, many of the challenges outlined above such as bundled interventions, spillover, selection bias, small sample sizes, etc. are not unique to forest conservation and biodiversity IEs. These apply (generally) to IEs in the sphere of international development, and a number of data and technological advancements have improved the potential for rigorous conservation evaluations. Conservation could follow suit. Although some biodiversity and conservation outcomes will take decades to observe, behavioral change will be observable within one to two years after interventions and provides an indication of future program efficacy.

The lack of robust evidence makes it difficult to draw insights to inform future conservation efforts and a number of studies over the past decade have emphasized the need for more rigorous experimental and quasi-experimental studies related to conservation outcomes (Curzon and Kontoleon, 2016; Ribas et al., 2020). Nevertheless, there is a growing body of quasi-experimental conservation IEs, including two new studies focused on conservation and biodiversity that are funded by USAID. Even if conservation studies are necessarily focused on a single landscape, more rigor in learning will show applicability to other contexts, where, as noted, practitioners and donors routinely implement conservation programming with much less of an understanding of impacts and their mechanisms. Given the current dearth of understanding and use of evidence with a high risk of bias and noise, building the knowledge base through significant learning for an IE over time has great value.

1.3. INTERVENTION

The USAID/Colombia LfP activity is a five-year activity (September 2019–August 2024) with the objective of formalizing land tenure and property rights to foster licit, rural economic development. LfP builds on prior USAID investments in the land sector in Colombia to sustainably improve the conditions of conflict-affected rural households. LfP is implemented by TetraTech in conflict-affected regions in Bajo Cauca-Sur

de Córdoba, Catatumbo, Meta-Ariari, Montes de María, Northern Cauca, Southern Tolima, Tumaco, and SMVC.

The LfP activity comprises three main components involving 1) massive land titling, 2) strengthening local government capacity, and 3) promoting public-private partnerships (PPPs). LfP targets interventions holistically in sites, as appropriate. A total of eleven municipalities across the seven micro-regions were selected as pilot municipalities that will receive all three LfP components. An additional corridor of contiguous municipalities will not have a massive parcel sweep but will have other elements of the three activity components implemented. In total, these components will provide access to land titles while supporting land restitution as part of a broader land title policy support, strengthening local government capacity, and supporting citizens to engage in licit socio-economic opportunities in target areas.

In late 2020, USAID and the Government of Colombia (GoC) agreed to expand LfP's previous geographic footprint to include selected deforestation hot spots in SMVC. The goal of implementation in the additional geographies is to explore methods that focus on the integration of three thematic areas—licit and sustainable livelihood promotion, land formalization,[1] and environmental local capacity strengthening—with a particular focus on changing behaviors associated with deforestation. This evaluation covers the expansion of LfP activities in the SMVC.[2]

The broad objective of LfP's activities in the SMVC is to contribute to reducing drivers of deforestation, conserving biodiversity, and promoting sustainable, improved livelihoods in SMVC by providing learning on how to adapt formalization and cadastral assistance methods to various contexts.[3] In order to achieve this, LfP is undertaking interventions focused on: strengthening land tenure and regularization; improving resource governance and protection through updated cadastral information and imagery and training of local environmental entities to use the information more effectively; and supporting sustainable economic development. Within the SMVC, LfP will undertake these activities in three primary sites: the Chiribiquete National Park (CNP), small communities in the vicinity of the CNP's northwest border,[4] and the Puerto Rico municipality, as shown in Figure 1.

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[1] In Colombia, "land formalization" could be interpreted narrowly as providing legal title to private land, however it is intended here and throughout the document to refer broadly to also include the adjudication of public lands, conservation contracts, or use rights agreements.

[2] A separate IE, undertaken by NORC at the University of Chicago, focuses on 10 of the 11 so-called pilot LfP municipalities receiving the LfP intervention. More information about the core LfP IE is available at https://www.land-links.org/evaluation/evaluation-of-the-land-for-prosperity-lfp-activity-in-colombia-baseline-report/.

[3] However, as discussed in the ToC subsection, LfP SMVC pilot activities alone are not sufficient to achieve these objectives.

[4] The final number of these communities is to be determined as of this report's drafting (January 2023).

Figure 1: Map of LfP Activities in SMVC Additional Geographies
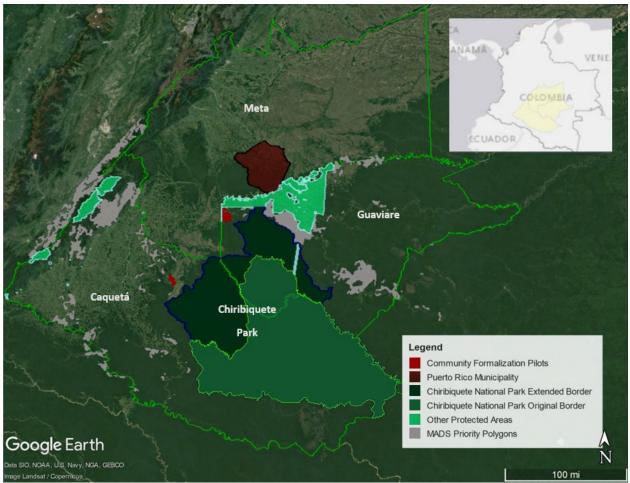

Across each of the three intervention sites, LfP will provide differentiated interventions tailored to the local needs and context. Table 1 presents a summary from the FA in this evaluation on the content of the interventions across the three geographies (CNP, pilot communities, and Puerto Rico), and the following subsections present each component in more detail.

TABLE 1: SUMMARY OF LFP AMAZON INTERVENTION COMPONENTS[5]

Intervention Component	Green Formalization, Tenure Security, Cadaster, and Imagery	Land Policy Capacity Activities	Green Value Chain Opportunities
1. Delineation of CNP Border and Key Features Therein	• Imagery for precise border and key feature delineation • Facilitate cadaster update for 4.3 million hectares of CNP land	• Capacity building with the National Parks authority (PNN) and the Ministry of Environment and Sustainable Development (MADS) for managing cadaster data and monitoring land use • Capacity building with IDEAM to monitor risks and presence of deforestation using imagery and cadaster • Socialization of park boundary with local communities	• N/A
2. Community-level Formalization Pilots	• Geospatial survey of geography • Demand-driven formalization via land use contracts • Training and community socialization of land use contract strategy	• Capacity building with local authorities and CSOs for monitoring and enforcing terms of land use contracts, integrating agrarian and environmental objectives of land use	• PPPs tailored to local population in each community
3. Puerto Rico Parcel Sweep	• Parcel sweep for formalization of land titles/land use contracts, as appropriate for local use restrictions (e.g. PNN Macarena, mining/energy concessions, illicit crop restrictions, etc.) • Facilitate updated multipurpose municipal cadaster	• Municipal Land Office (MLO) establishment with environmental objectives • Capacity building for local land and environmental authorities	• PPP tailored to local population in municipality • Training of/engagement with community members

CNP BORDER DELINEATION

First, LfP will facilitate more precise delineation of the recently expanded CNP border and thereby support GoC officials in their efforts to enforce it for improved land use management on and around the park's border. Specific activities under this component are: providing imagery for precise border verification and key feature delineation; providing information for cadaster updates for almost 4.3 million hectares of CNP land; capacity-building with the National Parks authority and the Ministry of Environment and Sustainable Development (MADS) and monitoring land use and land cover change; capacity-building with the Colombia Institute of Hydrology, Meteorology, and Environmental Studies to monitor risks and deforestation with imagery and cadaster; capacity support to Regional Environmental Autonomous

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[5] LfP SMVC elements are referred to as "intervention components." These are site-specific packages of interventions with activities that fall under one or more of the LfP activity components.

Corporation officials to improve their management of protected areas; and socializing park boundaries with local communities.

The core activity in this intervention is the provision of high-resolution imagery to support an updated cadaster for the CNP to permit delineation of the park boundary, indigenous reserve zones within the park, and the (likely illegal) claims of other occupied areas within the park with increased precision. The imagery provided by LfP may additionally facilitate follow-up analysis of land use patterns and opportunities. LfP will complement the provision of high-resolution imagery with capacity-building and technical assistance to the National Natural Parks Unit (PNN) and MADS, which will permit them to effectively manage cadastral data, monitor land use, and conduct sustainable land-use planning consistent with established regulations for protected areas once the imagery is in hand. The final component of this intervention is a process to socialize the CNP border's delineation and its implications with communities and local land governance and environmental authorities who live near the CNP. This includes communicating the CNP's precise boundary location and allowable land use.

Supposing that the border is delineated with sufficient precision to permit its enforcement by the GoC, that communities are aware of and abide by its precise location, and that GoC and other projects capitalize on inputs to provide law enforcement capacity and replicate LfP formalization approaches to other communities in the buffer zones,

USAID anticipates that the activities comprising LfP SMVC will lead to a reduction in the drivers of deforestation and environmental crimes in treatment sites (including land grabbing, cattle ranching, licit and illicit crop cultivation, timber extraction, wildlife trafficking, and others). Reduced deforestation is expected to improve biodiversity conservation through the avoidance of habitat loss and the preservation of wildlife corridors. Reduced burning of forest and clearing of forest for cattle ranching is expected to have a positive impact on climate change mitigation through reduced emissions, while forest cover retention will further support this impact through carbon storage and sequestration.

In contrast to LfP's other interventions in SMVC, the border delineation intervention does not offer contractual instruments to support increased land tenure for individuals living in the CNP. This intervention focuses on increasing the GoC's capacity to enforce land use restrictions and administer land governance in a way that closes current pockets of opportunity to cross into the park, along with a viable enforcement mechanism to prosecute environmental crimes. This intervention will also occur at a much greater geographic scale than the other two interventions LfP will implement in this geography, as its reach spans the entire CNP park boundary, while the other intervention components take place at the scale of a single municipality or two communities.

COMMUNITY-LEVEL FORMALIZATION PILOTS

LfP SMVC's second intervention component focuses on community-level formalization pilots in small communities in the vicinity of the CNP's northwest border in order to reduce incentives for deforestation and promote sustainable, licit livelihoods in the targeted area. These communities, the first two of which are located near San José del Guaviare in the Guaviare department and San Vicente del Caguán in the Caquetá department, are not formal administrative entities (e.g., veredas), but rather agglomerations of farms and residences that have colonized Amazon forest reserve areas near the CNP border.

LfP's standard approach to multipurpose cadaster updates and to promoting increased tenure security and formalization through massive titling is not feasible in the forest reserves where the pilot communities are located[6.] Instead, LfP will test a collaborative approach (one of three methods allowed by the GoC) to update the cadaster and support the issuance of land-use contracts (a novel contract instrument) only adopted in recent years in Colombian law), to increase tenure security and promote accountability for land use[.7] As part of this approach, LfP will conduct a geospatial survey of each community, and subsequently offer land-use contracts to individuals for parcels whose territory falls within or overlaps with the community boundary. LfP will also complete training and community socialization on the land-use contract strategy, capacity-building with local authorities and civil society organizations for monitoring and enforcing the terms of land-use contracts, and PPPs that will incentivize local community members to transition from illicit and/or unsustainable income-generating activities to participation in green value chains.[8]

PUERTO RICO PARCEL SWEEP

The final SMVC intervention component is a municipality-wide massive formalization effort in the Puerto Rico municipality using the parcel sweep method. In addition to the parcel sweep of land titles/land use contracts, under this component, LfP will facilitate the update of a multipurpose municipal cadaster by providing imagery to the GoC, establishing a Municipal Land Office (MLO) with environmental objectives, conducting capacity-building for local land and environmental authorities, developing PPP tailored to the local population, and training and engaging with community members on environmentally friendly formalization.[9] Like the community formalization pilots, it will also attempt to pursue PPPs that connect community members with opportunities to participate in "green" value chains.

This component extends LfP's standard approach to massive land titling and land administration strengthening (establishment of an MLO) into a new area of SMVC's geography, with minor adaptations.[10] The Puerto Rico Municipality was selected as a new project site within the SMCV geography because it is contiguous with LfP's other activities; LfP's activities in Puerto Rico will expand upon existing formalization efforts in two adjacent municipalities (Fuente de Oro and Puerto Lleras). Also, Puerto Rico provides an example of agrarian frontier land around the border of the La Macarena National Park; formal land tenure and the presence and land governance capacity of the state are expected to increase at a significant scale along a strategic corridor with critical access points to the Macarena. The expectation is that the Puerto Rico site will demonstrate the value of formalization to slow incursion into the La Macarena National Park.

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[6] It is not permitted to hold formal land titles or transition contracts in these areas.

[7] These ten-year contracts give the contract holder exclusive use rights aligned with relevant regional land use restrictions that are monitored and enforced by local authorities, although they do not give the contract holder ownership over the land and are not inheritable. It is possible that these land use contracts could become "conservation contracts" if the GoC additionally offers "voluntary conservation agreements" to individuals who take up land use contracts, though LfP believes it is unlikely that the intervention will issue many conservation contracts given GoC's previous difficulties coordinating the administration of land use contracts and voluntary conservation agreements.

[8] This element will not be completed as a package with the other community-level formalization pilot interventions. Rather, LfP component 2 and component 3 interventions in the area will be intentionally targeted to benefit these formalization communities.

[9] MLO establishment and capacity development in Puerto Rico are not conducted under the Puerto Rico parcel sweep. Rather, they will be conducted in Puerto Rico under the LfP overall implementation strategy, which features 11 municipalities benefitting from all three components, plus a corridor of contiguous municipalities that will not have a massive parcel sweep but may have elements of all three activity components implemented. Some activities will benefit households beyond these corridors in each region.

[10] These modifications account for environmental zoning and use restrictions that are less prevalent in LfP's original geography. Additionally, while the standard LfP approach also pursues PPPs that promote licit and improved livelihoods, these PPPs less often target environmentally sustainable livelihoods explicitly.

PROJECT TIMELINE

According to LfP's workplan for the SMVC region and consultations that occurred between the ET and LfP in November 2022, activities will begin in mid-/late February of 2023 and continue for approximately one year and a half. Table 2 shows an approximate timeline for LfP activities. PPP activities in the Puerto Rico municipality have already begun and parcel sweep activities will begin in mid-/late February. Parcel sweep activities will be completed by June 2024. The GoC will then process the information and deliver titles/contracts. The CNP border delineation work is also slated to begin by the end of February 2023 and will be completed by September 2023. LfP will then submit it to the GoC, and it will require six months to be accepted by the state, ending in March 2024. This work will not affect data collection. The Community Pilots will take place in two phases: the first beginning in March and the second beginning the following November of 2023. LfP anticipates that this work will continue for six months each. In order to ensure baseline measures are completed before activities launch, the evaluation will prioritize data collection in the Puerto Rico municipality in February, followed by the first formalization pilot community.

	2022	2023												2024					
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
CNP*			▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓				
Community Pilot 1#			▓	▓	▓	▓	▓	▓	▓										
Community Pilot 2												▓	▓	▓	▓	▓	▓		
TBD Additional Community Pilots												▓	▓	▓	▓	▓	▓	▓	▓
Puerto Rico Parcel Sweep^			▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Puerto Rico PPP	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓

* Cadaster will be complete by Sept. 2023, but it requires six months to be accepted by the state after LfP submits it to the GoC.

LfP cannot begin formalization pilot operational work until they have legal clarity and buy-in among the community. LfP is conducting sensitization activities to generate buy-in and anticipate beginning activities in April, but this timeline may shift.

^ Parcel sweep will finish by June 2024; GoC will process and deliver titles/contracts after this date.

1.1. EVALUATION PURPOSE & USE

The purpose of this evaluation is twofold.

First and foremost, endline and follow-up evaluation results will provide evidence-based policy inputs for USAID and the GoC to attempt similar strategies at a larger scale in deforestation hotspots throughout the Amazon region, including in areas with overlapping use restrictions where land titles cannot be issued throughout the Amazon region. The ET will use data collected during endline and follow-up to analyze the linkages between the LfP interventions in the SMVC region and 1) the promotion of licit, sustainable livelihoods; 2) reduced deforestation, 3) reduced corruption; 4) wildlife and biodiversity conservation; and 5) climate change mitigation, to which LfP is meant to contribute.

Per LfP's ToC, its planned activities in the SMVC are not deemed sufficient for achieving broad objectives of stemming deforestation, promoting biodiversity, and increasing climate change mitigation without complementary interventions from other stakeholders and/or implementation at a much larger scale. In the SMVC, LfP's interventions are serving as a proof of concept to determine whether the methodologies employed will improve conservation and livelihood outcomes; the methodologies the activity will employ to promote formalization, monitor and enforce land use restrictions, and advance licit economic opportunities are without precedent in the local context. LfP's interventions thus serve as a test of these methodologies in pilot contexts, with the aim of demonstrating evidence-based policy inputs for the GoC. Should LfP demonstrate that these methodologies succeed in achieving their short-term goals for improving tenure security and land governance in ways that favor environmental conservation and reduce deforestation, the GoC could expand these methodologies to other deforestation hotspots at a scope that is sufficient to yield desired changes in deforestation, biodiversity, and improved livelihoods at a landscape scale.

Second, in the short term, the LfP SMVC evaluation will provide baseline measures on indicators of interest to USAID. This includes baseline statistics on initial behaviors and attitudes among beneficiaries and other key stakeholders relating to livelihoods, land use, conflict, and land administration outcomes, in addition to initial deforestation conditions, to compare to measures taken after the intervention. In addition, the baseline data will provide LfP with insight to refine its understanding of needs and approaches for programming. While this tasking covers baseline data collection and analysis, the ET recommends three rounds of data collection over time: baseline, endline, and follow-up five years after the activity end date. At each round, the data will be used to adapt LfP activities and inform government and other donor programs in the Amazon region.

2. THEORY OF CHANGE

This section draws heavily from program documentation and the NORC evaluation FA.

LfP's expansion into SMVC—a priority geography rich in ecological and biological resources under threat—is based on the hypothesis that addressing land tenure issues disincentivizes further deforestation, promoting biodiversity conservation and climate change mitigation, and that proper land use management and administration in and around PNNs disincentivizes illicit crop cultivation in environmentally protected areas. Specifically, according to the LfP Biodiversity and Sustainable Landscapes Plan:

IF "green" formalization (use rights), tenure security, an up-to-date cadaster, and related imagery for priority sites are achieved through formalization pilots and local land policy capacity activities adapted to SMVC's context (environmental restrictions, illicit crops, and ethnic lands) and enhanced by biodiversity and sustainable landscapes-relevant guiding principle actions; **THEN** incentives for deforestation will be reduced and institutional and community capacity to monitor deforestation and enforce sustainable land uses will be improved; **AND IF** strategic partnerships expand "green" value chain opportunities for local people,[11] **THEN** a virtuous cycle of sustainable, improved livelihoods and biodiversity conservation will gain momentum, helping to preserve buffer zones and protected areas.
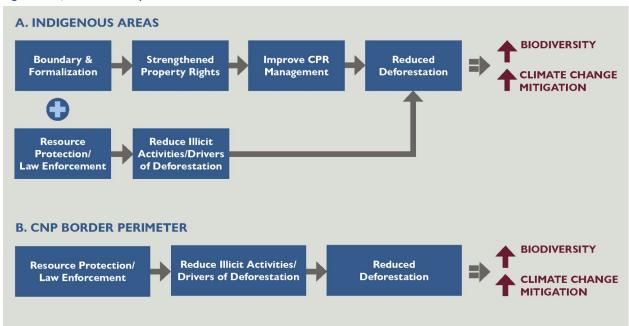
Each of these interventions operationalize the general ToC in a different way and at a different scale, as outlined below.

2.1. CNP BORDER DELINEATION

The first LfP SMVC intervention component provides Colombian government authorities with resources to precisely delineate the recently expanded border to the CNP, as well as the delineation of key features[12] within the CNP, so that the boundary can be enforced by the GoC for improved land management on and around the park border. It will further create the opportunity for the GoC to analyze the detailed imagery within the park boundary to promote sustainable management of the land therein by relevant environmental authorities. These activities are expected to result in strengthened property rights and reduce illicit activities and drivers of deforestation, in turn contributing to reducing deforestation. The long-term goal is to improve biodiversity and climate change mitigation. Figure 2, below, contains a summary logic model for this intervention component. Please also see Figure 9 in Appendix C: Expanded Project ToCs for the full logic model developed during the FA.

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[11] Please note that the portions of the overall ToC covering green value chains do not apply to the CNP border delineation component, where green value chain activities are not taking place.

[12] These key features include the formally constituted indigenous reserve of Itilla in the north of the park, the areas informally occupied by indigenous communities in the Apaporis area in the park's south, and more recent informal occupation of the park's western and northern areas by campesino communities.

Figure 2: LfP SMVC Component 1—CNP Border Delineation—ToC

2.2. COMMUNITY-LEVEL FORMALIZATION PILOTS

The second SMVC intervention component pilots a strategy to reduce incentives for deforestation and other illicit activities and promote sustainable, licit livelihoods in the buffer zones along the border of the CNP in two communities (Figure 3 below and Figure 10 in Appendix C). The Community Formalization Pilot ToC presumes that an increase in landholders' tenure security through land use contracts[13] coupled with effective monitoring and compliance of the terms of these contracts will lead landholders to make increased investments in the land, reduce deforestation and forest-degrading land uses, and alter their land use behavior toward more sustainable, licit uses supported by PPPs. The presence of land use contracts and enforcement of associated restrictions will not only increase formality and decrease drivers of deforestation directly, but also work together with increased presence of land governance authorities and green, licit livelihood opportunities to increase community members' expectations for formality in the future. Together with increased knowledge of themes related to sustainable land use, these expectations will influence community members' decisions to choose licit, sustainable livelihoods that conserve their land and forego illicit behaviors that drive deforestation and biodiversity loss such as land grabbing, agricultural frontier expansion, cattle ranching, timber extraction, and illicit crop cultivation.

LfP's ToC presumes that the community formalization pilots will not affect deforestation and biodiversity conservation at the landscape scale on their own, but rather that they will yield evidence-based policy inputs regarding changes that take place at the parcel level and that will allow the GoC to learn from and apply a similar strategy at a larger scale in the future to obtain impacts on these long-term outcomes at scale. As such, in the short term, it is expected that there will be changes in land use behaviors and indirect

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[13] The LfP SMVC FA notes that, although the land use contract instrument has been issued previously in Colombia, there are significant gaps in evidence regarding the optimal process to issue these contracts. These evidence gaps include the lack of an adequate methodology to socialize this mechanism with communities, the lack of coordination of all GoC entities needed to turn land use contracts into a tool for conservation, and the lack of capacity to regulate their use for environmental conservation and monitor their enforcement. Further, in previous use cases, land use contracts have not been implemented with complementary support for alternative livelihoods, which could affect the extent to which prospective contract-holders are sufficiently incentivized to take up the contracts and abide by land use restrictions that the contracts impose.

measures of land use changes that drive deforestation and biodiversity loss at the level of individual landholders and parcels, rather than changes in deforestation and biodiversity loss at the landscape scale.

This ToC also stands to be indirectly influenced by the CNP border delineation—given that these communities are in buffer zones of the CNP, enforcement of the CNP border following its precise delineation by LfP should simultaneously reduce the availability of land for deforestation and increase the costs of deforestation in the vicinity of the park if communities engage in resource use near the park boundary.
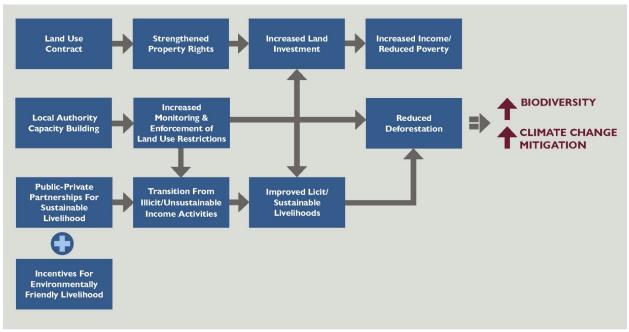
Figure 3: LfP SMVC Component 2—Community-Level Formalization Pilots—ToC

2.3. PUERTO RICO PARCEL SWEEP

The third LfP SMVC intervention component is a municipality-wide massive formalization effort in the Puerto Rico municipality using the parcel sweep method (Figure 4 below and Figure 11 in Appendix C). Through this intervention, LfP aims to improve land administration and governance for conservation and increase investment via strengthened tenure security with the ultimate goals of improving sustainable livelihoods, reducing poverty, and in the long term, reducing deforestation and increasing biodiversity.

Specifically, LfP expects that the Puerto Rico formalization pilot will limit and promote environmental recovery from the expansion of the agricultural frontier into the Macarena national park by providing secure land tenure to farmers and reducing incentives to clear the forests and expand settlement. Establishing property rights and tenure security and updating the cadaster through the parcel sweep will reduce incentives for deforestation and improve institutional and community capacity to enforce existing land use rules, together with improved access to land information and services via the MLO and Regional Land Office (RLO). PPPs that demonstrate viable and sustainable context-relevant value chains will motivate sustainable land use, over time contributing to carbon sequestration and regulation of temperature and water cycles if pursued at scale. Establishing an MLO in Puerto Rico and an RLO covering La Macarena, Mesetas, Puerto Concordia, La Uribe, and Vista Hermosa and building local land policy

capacity is also expected to help sustain formality. Both the MLO and the RLO are expected to contribute to the implementation of policies on land governance and conservation of biodiversity by promoting training and awareness of landowners about environmentally friendly formalization, along with strong articulation with natural parks and environmental authorities to reinforce their control and surveillance.

It is expected that municipal-scale mass formalization in the rural areas of three contiguous municipalities (Puerto Rico, as well as core LfP municipalities Fuente de Oro and Puerto Lleras) will create a cluster of land formalization in the area that may provide an additionally important demonstration effect with respect to the role of the interventions in reducing drivers of deforestation and biodiversity loss, slowing the advancement of the agricultural frontier, and dampening the spread of illicit activity in the region.

It is also possible that this coordinated approach across the three municipalities could help to reduce the risk of negative spillovers, whereby environmentally destructive land use activities are merely displaced to other areas—to nearby communities with weaker land tenure, governance, and sustainable livelihood opportunities. Increased formality in these areas could also indirectly reduce negative spillovers by incentivizing actors who might pursue environmentally destructive activities to change their behavior in favor of more formal and less environmentally destructive activities.[14]

Results from this intervention component will provide additional learning and evidence-based policy inputs for the GoC to apply in deforestation hotspots, and perhaps particularly so in areas with a similar balance of land under restricted uses and land available for private ownership and hence eligible for titling.

Figure 4: LfP SMVC Component 3—Puerto Rico Parcel Sweep—ToC

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[14] This dynamic not only applies to LfP's efforts in access points to the Macarena and CNP but also more broadly to contemporary efforts by USAID (e.g., Amazon Alive), the GoC, and other actors (e.g., UK Aid, etc.) to "squeeze out" informality and promote licit, sustainable livelihoods throughout SMVC.

3. EVALUATION DESIGN

3.1. EVALUATION QUESTIONS

The principal aim of the evaluation is to improve the knowledge base about:

- Drivers of deforestation and biodiversity loss in the intervention implementation areas and the impacts of the proposed LfP activities on reducing deforestation, biodiversity loss, and maintaining intact forest landscapes.[15]
- Linkages between increased tenure security through land titling, land use contracts, or any other means and behavioral changes that could drive conservation outcomes, and the extent to which impacts on such outcomes are sustainable given the socio-political context of the additional geographies.
- Learning interests related to cadaster update work, including the process and decision-making around resolving conflicts about overlapping or multi-use land areas.
- Effectiveness of anti-corruption interventions or activities on deforestation, biodiversity loss, and maintaining intact forest landscapes.[16]
- Understanding changes in land management as a whole in the SMVC directly or indirectly linked to the intervention, and how these interact with reducing deforestation and estimated land-based greenhouse gas emissions.
- Determining whether and how the GoC leverages resources and capacity-building provided by LfP for improved national, regional, and local environmental and land governance, reduced deforestation, and reduced environmental crime.

The evaluation will focus on the following three EQs:

EQ1: What changes in (i) land use and behaviors driving deforestation and biodiversity loss and (ii) participation in sustainable, improved livelihoods occurred among households in the formalization pilot communities and Puerto Rico municipality following LfP's interventions? What evidence is there that these changes may have been caused directly or indirectly by LfP, and through what mechanisms?

1.1 How did changes differ between pilot areas and the Puerto Rico municipality, based on the specific contract instruments used in each? How do the different instruments, methodologies, and activities employed affect the perceived sustainability of changes?

1.2 What, if any, important contextual influences on LfP's ability to update cadasters and formalize land tenure arrangements result from the presence of different types of overlapping areas with defined use restrictions (e.g., forest reserve zones, campesino reserve zones, indigenous reserves, national parks, etc.)? If areas with overlapping use restrictions are found, how does the presence of these areas affect LfP's outcomes and sustainability?

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[15] USAID is interested in the feasibility of incorporating design options to measure biodiversity conservation outcomes in a direct and rigorous manner. Amazon Alive will be incorporating this learning activity into their evaluation and it will not be part of this evaluation.

[16] The evaluation will use qualitative data to assess the contribution of corruption as a contextual factor to outcomes observed, but will not measure it as an outcome of LfP because direct changes in corruption and environmental crime are outside the scope of LfP activities (i.e., within the scope of other programs and/or follow-on actions by the GoC).

1.3 Is there any evidence that LfP's activities caused spillover of deforestation drivers and illicit activities into surrounding areas?[17] Are there any other possible unintended outcomes of LfP's activities, whether positive or negative?

EQ2: What changes occurred in regional and local land governance, environmental governance, and the reduction of environmental crime and corruption within the CNP and its buffer zones following the provision of high-resolution imagery of the CNP, the updated cadaster within the CNP, capacity-building with relevant GoC authorities, and socialization of the CNP border with local communities?[18] What evidence is there that LfP's activities contributed directly to these changes, and through what mechanisms? To what extent were results bolstered by complementary measures from other programs or the GoC?

EQ3: What impact does the delineation and enforcement of the CNP border have on deforestation, habitat connectivity, and biodiversity conservation within the CNP and in portions of the buffer zones where LfP conducted complementary activities to decrease activities driving deforestation? What are the reasons for observed impacts? Is there evidence of any effect on deforestation or biodiversity conservation elsewhere in SMVC geography to which LfP may have contributed?[19]

Following from these questions, the evaluation will seek to test the following hypotheses that correspond to the main quantitative outcomes:[20]

TENURE SECURITY

H1 Households receiving land titles/land use contracts through the LfP SMVC will have greater perceived tenure security.

H2 Households receiving land titles/land use contracts through the LfP SMVC will experience lower frequency and severity of land conflicts.[21]

LIVELIHOODS

H3 Households receiving the LfP SMVC interventions will have greater participation in licit and sustainable income activities.

H4 Households receiving the LfP SMVC interventions will have improved livelihoods and well-being.

INVESTMENT

H5 Households receiving the LfP SMVC interventions will make more field investments to improve productivity.

H6 Households receiving the LfP SMVC interventions will make more non-productive property/housing investments.

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[17] The evaluation will only be able to track spillover of illicit activities in the selected comparison geographies.

[18] Because surveys are not taking place in these areas, the evaluation will measure the effect of the CNP border delineation interventions as a package.

[19] Because it is a geospatial IE, without triangulating primary data collection, the ability of the CNP border delineation to identify reasons for observed impacts will be limited.

[20] PE questions that will be answered primarily through qualitative data do not have an associated hypothesis.

[21] It is possible that in the short term (at endline) conflicts may increase due to the formalization process. The ET will use qualitative data to understand the processes and mechanisms observed during endline data collection.

GOVERNANCE

H8 Households in areas receiving LfP interventions will report greater understanding of CNP border location and regulations.

H9 Households in areas receiving LfP interventions will perceive greater capacity of the GoC to engage in land use monitoring and enforcement.

H10 Households receiving the LfP SMVC interventions will be more likely to expect penalties from illicit activity in protected areas.

H11 Households receiving the LfP SMVC interventions will engage in less unauthorized land clearing.

H12 Households in areas receiving LfP interventions will report greater satisfaction with and confidence in land administration and governance.

DEFORESTATION AND BIODIVERSITY

H13 Areas receiving LfP SMVC interventions will experience fewer new incidents of deforestation (forest loss).

H13 Areas receiving LfP SMVC interventions will experience less forest degradation.

H14 Areas receiving LfP SMVC interventions will experience lower incidence and extent of fires.

H15 Areas receiving LfP SMVC interventions will experience greater forest recovery and connectivity in previously deforested areas located near the main forest.

H16 Areas receiving LfP SMVC interventions will have greater total forested area.

H18 Areas receiving LfP SMVC interventions will have greater biodiversity (species abundance and richness).

3.2. EVALUATION APPROACH

To thoroughly address all EQs, the ET proposes a mixed-methods evaluation that will include IE and performance evaluation (PE) components. The team will implement a comprehensive approach that examines outcomes and impacts across LfP SMVC's ToC. This proposed evaluation methodology draws from the FA conducted by NORC at the University of Chicago.

The evaluation includes a causal impact analysis for deforestation measures; the ET will assess performance indicators and outcomes through a mixed-methods approach that triangulates findings from multiple quantitative and qualitative sources. Because of the largely distinct geography and content between of the three LfP SMVC region intervention components, the evaluation will explore outcomes related to each distinct intervention component, as well as tracking CNP deforestation rates near Puerto Rico and the pilot communities for evidence that the interventions in those areas affected conservation outcomes in/near the CNP.

The evaluation will combine data analysis of spatial administrative data, spatial data derived from satellite imagery, household surveys with beneficiary community members,[22] focus group discussions (FGDs), and semi-structured interviews (SSIs) with stakeholders and beneficiaries. Where possible, the evaluation will

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[22] The evaluation will stratify the baseline sample to include known household beneficiaries. Because not all beneficiaries will have been identified at the time of baseline data collection, the baseline sample will not overlap with all program beneficiaries.

conduct rigorous quantitative analysis comparing trends in project and comparison communities. The evaluation design incorporates survey modules of female decision-makers to improve understanding of the gendered effects of the programming. Additional analyses may be conducted on other subgroups of interest, such as large land holders, households headed by ethnic minorities (Afro-Colombian[23] and Indigenous) or migrants, and conflict-affected households. A summary of primary outcomes and data sources used to answer each EQ is presented in Table 3 below.

TABLE 3: SUMMARY OF EQS, KEY OUTCOMES, AND DATA SOURCES

EVALUATION QUESTION	OUTPUTS AND PERFORMANCE MEASURES	OUTCOMES	DATA SOURCE (E.G., QUANTITATIVE OR QUALITATIVE COLLECTION)
Tenure Security	Land titles granted and land use contracts executed Beneficiary experience (with analysis by subgroups) LfP SMVC performance	Perceived tenure security Index of land rights Frequency and severity of land conflicts	Household survey Administrative data SSIs FGDs Program documents
Livelihoods	LfP SMVC performance Beneficiary experience (with analysis by subgroups)	Participation in licit and sustainable income activities Household income Livelihood and well-being	Household survey SSIs FGDs Program documents
Investment	LfP SMVC performance	Field investments for improved productivity Non-productive property/housing investments Land clearing (negative externality)	Household survey Administrative data Satellite data SSIs FGDs Program documents

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[23] While Afro-Colombian communities are not officially granted territory in this area, the ET will survey a random sample of residents in the study area and conduct subgroup analysis for differential effects if there is a sufficient number of residents who identify as Afro-Colombian/Indigenous.

EVALUATION QUESTION	OUTPUTS AND PERFORMANCE MEASURES	OUTCOMES	DATA SOURCE (E.G., QUANTITATIVE OR QUALITATIVE COLLECTION)
Governance	Establishment of MLOs Park and illegal land occupation borders clearly delineated Establishment of MLOs Land administration and management institutions created/strengthened LfP SMVC performance Beneficiary experience (with analysis by subgroups)	Household understanding of CNP border location and regulations Perceived capacity within GoC for land use monitoring and enforcement Household expectations of the consequences of illicit activity in pilot communities New incidents of illegal land grabbing Satisfaction with and confidence in land administration and governance Prosecution of environmental crimes	Household survey Administrative data SSIs Program documents
Deforestation and Biodiversity	Park border and illegal land occupation borders clearly delineated Land use clearly communicated to residents LfP SMVC performance	New incidents of deforestation (forest loss)/deforestation alerts Forest degradation Habitat connectivity Incidence and extent of fires (burned area) Land use alignment with permitted uses along PNN Chiribiquete border Forest recovery and connectivity in previously deforested areas located near the main forest Total forested area Biodiversity—species abundance and richness (proxy/predictive measures) Land Cover Type Normalized Difference Vegetation Index	Administrative data Satellite data SSIs Program documents

This evaluation will also track secondary outcomes and outputs to further assess program progress and effects.

IMPACT EVALUATION

The design includes an IE focused on the CNP delineation intervention component, which is considered to be the most promising component to have a direct and attributable impact on reduced deforestation and biodiversity conservation.[24] This intervention is focused on both the perimeter of CNP, as well as the

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[24] However, the success of the CNP delineation component requires complementary actions by the GoC, other USAID activities, activities by other donors, and the Department of State's Bureau of International Narcotics and Law Enforcement, which are outside of LfP's manageable influence.

land inside the CNP, where land use or tenure rights are illegal with very few exceptions; however, it does not include dedicated efforts to promote green value chain opportunities.

To analyze impacts[25] of the CNP border delineation component, the ET proposes a geospatial IE, as recommended in the FA, which outlined two potential approaches to the IE, summarized in Table 4 below.

TABLE 4: SUMMARY OF CNP BORDER DELINEATION IE APPROACH OPTIONS

APPROACH	DESCRIPTION	RISKS AND LIMITATIONS
Quasi-Experimental Interrupted Time Series Design	Uses pre-intervention historical data to forecast the trajectory of outcomes, comparing them to actual realizations observed over the treatment period.	Cannot be used to measure impacts on biodiversity directly (because pre-intervention, time series historical data on biodiversity is not available). If used to measure changes in CNP buffer zones, the effects observed will be summative of all interventions during the evaluation period (not just LfP SMVC).
Spatial Regression Discontinuity (SRD) Using Synthetic Control	Compares trends in border areas of CNP to areas immediately outside boundaries, which are assumed to be similar in terms of topography, climate, markets, proximity to human settlements, proximity to roads/rivers, and other related drivers of deforestation.	Intervention coverage (CNP boundary) must be "nearly random" and not correlated with variables that may affect outcomes of interests. If program induces geographic spillover of deforestation to just outside the border, the IE will overestimate impacts.

In line with the recommended design put forward in the NORC FA, the LfP SMVC evaluation will measure the causal impacts of the CNP component on deforestation through an SRD approach using the remotely sensed data on forest condition described above. The sharp change in spatial coverage of the intervention enables the use of an SRD design. This assumes that land on either side of the border will be similar (on average) across any and all drivers of deforestation.[26] To the extent possible, the ET will overlay/integrate an analysis of the administrative data related to the prosecution of environmental crimes.

Recommended approaches to measuring key biodiversity outcomes, such as species richness and abundance, include: satellite imagery and/or aerial surveys to count sufficiently large wildlife that can be viewed from satellites (e.g., elephants), direct observation of species abundance, measurement through camera traps, acoustic sampling, and environmental DNA. Direct observation is time intensive, requires costly labor, and is generally not recommended in the study area given the security concerns. Similarly, camera trapping—which outperforms direct observation—would be too expensive for the allocated budget and is not advised due to security concerns. Environmental DNA is prohibitively expensive. The

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[25] It is important to note that it may not be possible to measure all expected outcomes of the CNP border delineation component via an IE approach. For example, the FA notes limitations in detecting forest degradation, which affects biodiversity and climate change mitigation outcomes, using remote sensing data.

[26] These include factors such as topography, elevation, climate, markets, proximity to human settlements, proximity to roads/rivers, forest cover trends, distance to nearest settlement, slope, etc.

satellite imagery sources listed above for measuring deforestation and forest degradation are not suitable for analyzing key biodiversity outcomes.

In addition to the data and measurement constraints, there would not be a counterfactual/comparison area to assess change in the framework of an IE. In the context of the study area, deforestation, fragmentation, and loss of habitat connectivity are the major threats to biodiversity. As a result, because of the ecological context, budget restrictions, and link between biodiversity outcomes and habitat loss, the evaluation will not use direct biodiversity measures. In line with the recommended approach from the NORC FA, this study will approach the study of biodiversity through proxy and predictive approaches. The ET assumes that reduced deforestation and improved habitat connectivity translate to improved biodiversity. Proxy measurements of species diversity and abundance will then be applied based on forest loss.

The IE approach will incorporate modeling and/or proxy measurements using deforestation and other contextual inputs to calculate expected changes in biodiversity based on measured changes in forest loss, land use patterns, and habitat connectivity. Global Forest Watch maintains and reports two measures at 1 km resolution for global biodiversity intactness and global biodiversity significance. Also, the PREDICTS database (Hudson et al., 2017) represents a potential method to model the impacts of land use change and human population density on biodiversity in forested areas. This evaluation will also explore the costs and benefits of applying a predictive approach, such as the method used by Heilmayr, Echeverrıa, and Lambin in 2020, to model the biodiversity impacts of forest gains and improved habitat connectivity.

PERFORMANCE EVALUATION

As outlined in the prior FA, the core analysis of changes following the community-level formalization pilots and Puerto Rico parcel sweep will be completed through a rigorous PE that estimates how the program shaped specific outcomes (to the extent possible). The PE will also provide information on how the LfP SMVC project worked, the institutions it created/strengthened, and the way that members of different social groups experienced the program.

The PE approach will involve analysis of outcomes related to USAID's EQs that are not conducive to an IE design, using a mixed-methods approach that triangulates findings from multiple quantitative and qualitative sources, in addition to a review of LfP SMVC project documents that will provide information on the project design, successes, and challenges in implementing the intervention. A strong PE methodology provides an effective way to obtain rich complementary descriptive understandings of program effectiveness, outcomes, implementation fidelity, and sustainability; this will allow the team to provide nuanced answers to USAID's EQs and, for outcomes covered by the IE, describe why impact results are occurring[27] (or why there may be unexpected findings). This information will help to provide a nuanced picture of variation in the program impact, allow the ET to test the assumptions embedded in the logic model, and provide lessons learned for scale-up or similar future programs.

The rigorous PE approach will incorporate a pre-post design that draws upon multiple rounds of surveying to capture trends along expected outcomes in LfP SMVC treatment and comparison communities. It will combine quantitative and qualitative data to compare outcomes before and after the implementation of

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[27] As noted above, because it is a geospatial IE without triangulating primary data collection, the ability of the CNP border delineation component to identify reasons for observed impacts will be limited.

the community-level interventions at the household and community[28] levels. The inclusion of comparison communities will allow the ET to compare trends observed in similar communities, half of which received an LfP SMVC intervention and half of which did not, and report where and how those trajectories may be diverging due to project interventions. The PE will use data from primary household surveys, qualitative SSIs and FGDs, and administrative data, to the extent available.

GENDER AND SUBGROUP ANALYSIS

The research design the team proposed aims to understand the gendered effects of the LfP SMVC project by stratifying the household survey sample so that half of the sample is women and conducting focus group discussions with women. Men and women have different access to land rights globally, including in Colombia. The ET will collect primary quantitative and qualitative data to report gender findings, including gender ratios on land use contracts and land titles. This focus on gender and social analysis will promote understanding of how the program and outcomes may have been experienced differently for women and other key subgroups relative to the average, and the reasons for those differences.

Besides women, subgroups of interest include those with small versus large landholdings, members of ethnic minorities (Afro-Colombian and Indigenous), and those experiencing a land conflict, especially those who might experience regular conflict due to transhumant migration. The evaluation will assess what drives observed heterogeneity in demand for land use contracts among different population groups and how the LfP SMVC program interacts with diverse demand.

3.3. SAMPLING

CNP BORDER DELINEATION

The ET will operationalize this design across a number of treatment groups for LfP SMVC. This will include a forest condition analysis of:

- The full CNP park border.
- Indigenous reserves within or overlapping the borders of CNP.
- Indigenous communities[29] within the park who may have valid claims but are not in formal reserves.
- Other communities with no legal standing to be inside the park.

COMMUNITY-LEVEL FORMALIZATION PILOTS

LfP defined the areas selected for the first two community-level formalization pilots in coordination with the National Land Agency (ANT) and MADS by overlapping geospatial datasets to locate deforestation hotspots, key locations from ecological connectivity analysis, and settlements in areas where informality in land tenure represented a significant threat to deforestation and biodiversity. According to LfP program documentation, the pilot sites were chosen according to the following criteria: 1) areas are within the CNP buffer zone; 2) areas are prioritized by MADS for right-of-use contracts; 3) areas are located in the ecological connectivity corridors defined by MADS; 4) polygons are in deforestation hotspots; 5) polygons fall within areas of influence, presence, or risk of illicit crops; 6) ANT and other relevant GoC institutions agree to the polygons' selection; and 7) there are no concurrent programs such as the National Program

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[28] Community-level analysis will take place at the level of the vereda and, for Puerto Rico, municipality.
[29] These indigenous communities are uncontacted and have special status under the law.

for the Substitution of Illicit Crops (PNIS), Visión Amazonía, etc. in these areas. Table 5 below lists the areas chosen, taking into account these criteria.

TABLE 5: CHARACTERISTICS OF COMMUNITY-LEVEL FORMALIZATION PILOT POLYGONS

	LOCATION	SIZE/ALTITUDE/ MINING AND ENERGY EXTRACTION SITE TYPE	ESTIMATED POPULATION	WITHIN ECOLOGICAL CONNECTIVITY CORRIDOR	RISK AREA FOR ILLICIT CROPS	OTHER PROGRAMS PRESENT
Polygon 1 (Guaviare)	West of municipality of San José del Guaviare, approx. 6 km from CNP border, in the vicinity of the villages of Peña Roja, La Unión, Fundación, Buenos Aires, La Orquídea and Itilla. Approx. 120 km from municipal seat by unpaved road passable in dry weather.	12,784 ha 300 masl Type B	500 families (goal to provide 300 land use contracts)	Yes, within ecosystem connectivity corridor defined by MADS and Natural Wealth	Yes	Yes, National Program for the Substitution of Illicit Crops
Polygon 2 (Caquetá)	In municipality of San Vicente del Caguan, approx. 13 km from CNP border, in the vicinity of the villages Candilejas Este and Ciudad Yarí. Approx. 155 km from municipal seat by unpaved road passable in dry weather.	4,787 ha 250 masl Type A	600 families (goal to provide 350 land use contracts)	Yes, intersects with the ecological connectivity corridor defined by MADS	Yes	No[30]

After additional preparatory information gathering, LfP determined that it may be necessary to undertake community-level formalization pilots in more than two polygons to meet the target number of land-use contracts to be delivered. The total number of polygons in which LfP will conduct community-level formalization pilots is still being considered due to: social resistance to the land use contracts, the government's lack of pedagogy, security conditions, and the geographic segmentation of polygons. Due to budget restrictions and the heavy presence of other actors working on use contracts in the area, LfP will partner with other organizations[31] to broaden the geographic reach of pilot work to other polygons. The intervention will be slightly different in these new polygons (less LfP-led), although work in the first two

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[30] This is unspecified in the LfP memo. The ET will work with LfP to confirm that this information is correct.

[31] These are: Fundación para la Conservación y el Desarrollo Sostenible, Amazonía Mía, WWF, Visión Amazonía, Instituto Sinchi, PNIS, Agencia Nacional de Tierras, Gobernación de Guaviare, and Gobernación del Caquetá.

polygons will also involve partnerships. As of this report's drafting, these additional polygons have not been selected; additional polygons are likely to be selected in the next 12 months. According to LfP, additional polygons will be selected from the set of all priority polygons defined by MADS and that meet LfP's criteria in San José del Guaviare, Miraflores, Calamar, San Vicente del Caguan, Cartagena del Chairá, and Solano municipalities.

The ET recommends collecting evaluation data in all polygons in the six municipalities, including those selected for the community-level formalization pilots and all polygons eligible for potential inclusion. This strategy will facilitate a rigorous case study performance evaluation comparison of the performance and project model across a number of LfP communities, including the partnership-based model. As this study represents a performance versus impact evaluation, the ET is not concerned with the lack of a 'true' comparison for the case-study approach.

This strategy of collecting data in these discrete area will also maximize the chances that the evaluation will be able to measure environmental outcomes in communities receiving the formalization pilots. If there are any polygons that are not selected for treatment by LfP – or, if treatment is staggered - they will form a comparison group, though in some instances the evaluation may need to account for the presence of other programming. To account for low uptake of land use contracts, at endline and follow-up data collection, a specific survey will be added for those who did receive land use contracts, in addition to the panel household survey with baseline respondents. Figure 5, below, depicts the first two selected community-level formalization pilot polygons (red) and the set of additional polygons eligible for LfP expansion (gray).

Figure 5: LfP Community-Level Formalization Pilot Polygons and Potential Additional Polygons

The ET will also select comparison households for the community-level formalization pilots by identifying households surrounding the selected polygons within the CNP buffer zone. The ET, in consultation with USAID, will finalize the selection of these areas according to available geospatial information prior to the launch of baseline data collection. To the extent possible, the ET will exclude areas where other tenure and conservation programming (e.g., Amazon Alive, Territorios Forestales) are taking place or planned. Figures 6 and 7, below, display the two community-level formalization pilot sites and settlements containing potential comparison households within a 12 km radius for the Guaviare and Caquetá pilot polygons.
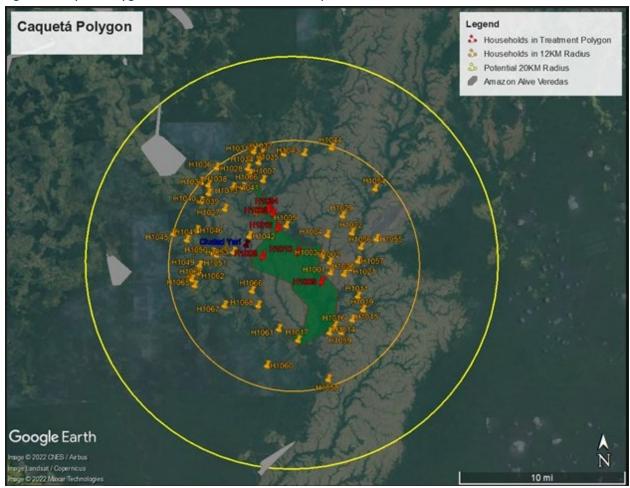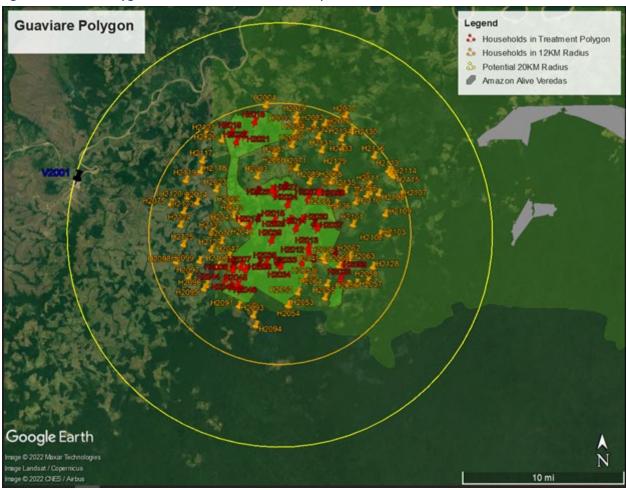
Figure 6: Caquetá Polygon Households and Potential Comparison Households

Figure 7: Guaviare Polygon Households and Potential Comparison Households

MUNICIPAL PARCEL SWEEP AND PPP ACTIVITIES

According to program documentation, LfP selected the Puerto Rico municipality from a list of 13 municipalities covered by Peace Accord-related Territorially Focused Economic Development Plans [PDETs] that are relevant to both deforestation hotspots and GoC priority areas, such as the Strategic Zones of Integral Integration (or Future Zones[32]). As noted earlier, LfP also considered synergies with its on-going program of activities in Meta in selecting this site. Puerto Rico is considered the edge of the agricultural frontier bordering the PNN Sierra de La Macarena. Informality is high, illicit coca cultivation is emerging. All of the municipality is subject to some type of environmental restriction: 40% is PNN[33] (serranía de La Macarena); and the other 60% is part of three AMEM Integrated Management Districts of different levels of restriction.[34] With the parcel sweep, LfP will cover 22 percent of the area of La Macarena National Natural Park and about half of two focal areas of the environmental Future Zone. The ET will select comparison households for this evaluation component in similar veredas across the Puerto Rico municipal boundary in the municipalities of Vista Hermosa, Puerto Concordia, La Macarena, and Mapiripan. The ET, in consultation with USAID, will finalize the selection of these areas according to available

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[32] However, the Future Zones no longer exist as a public policy under the new government.

[33] The formalization element of the parcel sweep is not applicable within the park - only the cadastre information updating.

[34] Sixty percent of land can be titled but there must be an Environmental Management Plan.

geospatial information prior to the launch of baseline data collection. To the extent possible, the ET will exclude areas where other tenure and conservation programming (e.g., Amazon Alive, Territorios Forestales) are taking place or planned. Figure 8, below, displays the Puerto Rico municipality and settlements containing potential comparison households within a 100km radius.

Figure 8: Puerto Rico Municipality and Potential Comparison Areas

4. DATA COLLECTION

4.1. ROUNDS OF DATA COLLECTION

The ET recommends three rounds of data collection: a baseline prior to the start of the main interventions,[35] an endline at least one year after the completion of project activities, and a follow-up to capture longer-term outcomes at least five years after the completion of project activities.

The recommended rounds of data collection and associated outcomes, instruments, and EQs are listed below in Table 6.

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[35] As described in the Project Timeline section, some activities have already begun (namely PPPs in Puerto Rico), but the main interventions to be evaluated such as parcel sweep will start after the baseline.

TABLE 6: LFP SMVC EVALUATION DATA COLLECTION SUMMARY[36]

DATA COLLECTION ROUND	TIMING	SOURCE/INSTRUMENT	SAMPLE SIZE	ASSOCIATED EQS
Baseline	February-March 2023	Household survey	2,000	EQ 1, 2, 3
Endline	February-March 2026	Administrative data	TBD	EQ 1, 2, 3
Follow-up	February-March 2030	Satellite data	NA	EQ 1, 3
		SSIs	51	EQ 1, 2, 3
		FGDs	12	EQ 1, 2

4.2. DATA SOURCES

The mixed-methods PE includes quantitative and qualitative data sources: household survey, interviews, FGDs, and analysis of administrative data.

HOUSEHOLD SURVEY: The household survey will ask household decision-makers questions regarding their land-use behaviors and practices, particularly in regard to deforestation and biodiversity loss, livelihoods, and land ownership status. It will include modules on perceived tenure security and local resource governance, as well as questions on attitudes and norms concerning conservation. The ET will also collect data in the household survey that allows for disaggregation of data on key dimensions, such as residence location. Follow-up data collection will address the households' contact with the project and respondents' perceptions of changes associated with the project. The household survey will specifically target female decision-makers by stratifying the household sample so that half of surveys are directed to the primary male decision maker and half of surveys are directed to the primary female decisionmaker in the household. As appropriate, the household survey will include questions from the ongoing LfP core activities IE and Amazon Alive PE to facilitate comparability across studies.

SEMI-STRUCTURED INTERVIEWS: SSIs will collect the views and attitudes of environmental and land sector stakeholders on the benefits and sustainability of the program. The interviews will include a set of targeted open-ended questions to address the research questions of interest. In addition, interviews will include information on land governance and institutional functioning, environmental governance and coordination, and the activities surrounding environmental crime and corruption. Follow-on data collection will address changes in key indicators and perceptions of stakeholders in terms of how those changes are associated with LfP activities. SSIs will consist of semi-structured questions administered to community leaders in LfP's intervention areas, local government officials, other community- and municipality-level stakeholders, LfP activity staff, and USAID representatives. The team proposes 51 SSIs with the following organizations and stakeholders:

- LfP Chief of Party, Deputy Chief of Party, Environmental Expert, Regional Coordinator (4)
- MADS (1)

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[36] This illustrative timeline assumes that all TBD additional community-level formalization pilots are completed by June 2024.

- PNN (1)
- Institute of Hydrology, Meteorology, and Environmental Studies (IDEAM) (1)
- Departamento Nacional de Planeación/Catastro Multipropósito (1)
- Ministry of National Defense (1)
- Ministry of Agriculture and Rural Development (MADR) (1)
- Ministry of Commerce, Industry, and Tourism (1)
- Agustin Codazzi Geographic Institute (IGAC) (1)
- National Land Agency (ANT) (1)
- Agency for Territorial Renovation (ART) (1)
- Prosecutor's Office (1)
- RLO covering La Macarena, Mesetas, Puerto Concordia, La Uribe, and Vista Hermosa (1)
- Mayor of Puerto Rico, as well as mayors of relevant municipalities in Guaviare, and Caquetá departments (3)
- Local government officials (MLO technician, cadastral/environmental office staff, etc.) (6)
- Puerto Rico PPP members (2)
- Community-level formalization pilot PPP members (2)
- Civil society organizations involved with the environmental agenda (e.g., Corporación por la defensa ambiental y el desarrollo sostenible del Amem) (1)
- Civil society organizations targeted for capacity-building activities as part of community-level formalization pilots (2)
- LfP SMVC subcontractors/implementers (3)[37]
- Local authorities (Indigenous authorities; livestock local committees; Forest Roundtable of Meta, Caquetá, and Guaviare; Sistema Departamental de Áreas Protegidas [SIDAP] of Guaviare and Caquetá; Community Action Boards [JACs]; Campesino associations of Guaviare and Caquetá) (11)
- Corporación para el Desarrollo Sostenible del Norte y el Oriente Amazónico Guaviare [CDA], Corpoamazonia (Corporación para el Desarrollo Sostenible del Sur de la Amazonia) Caquetá, and Corpomacarena (Corporación para el Desarrollo Sostenible de la Macarena) (3)
- Other programs/donors (e.g., Amazon Alive, Territorios Forestales, World Wide Fund for Nature) (2)
- Park rangers (2)

FOCUS GROUP DISCUSSIONS: FGDs with community members (men, women and PPP participants) will add depth to the topics addressed in the survey. FGDs will focus on land-use behaviors and livelihoods, need for LfP support (such as with land titles and land use contracts), concerns with tenure and land pressure, perceptions of resource governance and corruption, challenges with crop substitution, and contextual information on land use and land-use restrictions in the different zones. Focus groups will also include discussion of land clearing in the area and perceptions of the effectiveness of efforts to stop encroachment into protected areas. At endline and follow-up, FGDs will also cover potential spillover of

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[37] This includes the implementers of the Chiribiquete cadastre, the community-level formalization pilots, and the Puerto Rico parcel sweep.

program effects in surrounding areas and unintended consequences of project activities. Pending the identification of additional funds for specialized training, two of the focus groups in treatment areas will be conducted as radical listening sessions to provide community-led perspectives to inform programming.

SECONDARY DATA: The evaluation will complement the primary household survey and qualitative data with secondary administrative data on local administrative capacity for land administration and monitoring/enforcing land-use contracts, to the extent data is available, including environmental crimes data, digitized and electronic titling/transaction records, titling/transaction statistics, land use plans, land conflict records, and records of monitoring and enforcing land use contracts. The evaluation will also incorporate LfP SMVC monitoring indicator data on relevant outputs and outcomes, such as the functioning of offices established with project support and records of land conflicts resolved.

GEOSPATIAL DATA: Remotely sensed data is the primary data source for exploring the impact of the program on forest condition. This will include two types of available raster satellite imagery:

- Publicly available spatial remotely sensed data. This data has been used extensively to examine the impact of major deforestation events such as fires, infrastructure, large-scale land clearing. A number of academic studies employ geospatial IEs that use deforestation raster data to measure the impact of interventions on deforestation.
    - National Aeronautics and Space Administration/Moderate Resolution Imaging Spectroradiometer land cover and related products (Annual data from 2001, 250–500-meter resolution).
    - Global Forest Watch Radar for Detecting Deforestation (Near-real-time data from January 2020, 10-meter resolution).
    - University of Maryland Global Forest Change Data: Spatial units of forest loss (Annual data from 2000, 30-meter resolution).
- Orthorectified high-resolution multi-spectral and panchromatic imagery that is available to the U.S. Government through a licensing agreement with Maxar.
    - High-resolution satellite data obtained from Maxar's Global Enhanced GEOINT Delivery via a license provided by the U.S. Government. These images are at 0.3-meter resolution and are available annually from 2019.

Depending on data availability, the team will also collect and review cadastral data provided by LfP (raster data at the household level, CNP border data, border data in the indigenous areas within the CNP, and land use contract boundaries), as well as secondary geospatial data on other relevant contextual indicators including population size, location of land-based investment projects, distance to transport infrastructure, distance to urban markets, and variation in rainfall. The team will use contextual geospatial data to generate proxies such as population and distance to market to include in the descriptive analysis and regression analysis. This will enable the team to better understand contextual factors and measure the heterogeneity of treatment impacts, including how market, climate, and population pressures mitigate the program effects.

BIODIVERSITY MEASUREMENT: SMVC constitutes a high-biodiversity priority region in a priority country, and its conservation contributes to USAID's Biodiversity Policy. Due to measurement reliability challenges, value for money considerations, security concerns, and USAID and LfP input, as outlined in the FA, the evaluation will not focus on directly measuring biodiversity. Instead, biodiversity can be examined through proxy measurements of species abundance and diversity based on forest loss after calculating

expected changes in forest loss, land use patterns, and habitat connectivity. First, the ET assumes that reduced deforestation and improved habitat connectivity translate to improved biodiversity. Proxy measurements of species diversity and abundance will then be applied based on forest loss. Global Forest Watch maintains and reports two measures at 1 km resolution for global biodiversity intactness and global biodiversity significance. Also, the PREDICTS database (Hudson et al., 2017) represents a potential method to model the impacts of land use change and human population density on biodiversity in forested areas.

This evaluation will also explore the costs and benefits of applying a predictive approach, such as the method used by (Heilmayr, 2020) to model the biodiversity impacts of forest gains and improved habitat connectivity. Data from the Amazon Alive IE, household survey, FGDs, and SSIs on land use and deforestation behavior, triangulated with the satellite data analysis on deforestation, will provide the information for these approaches.

CARBON EMISSIONS ANALYSIS: At present, data on carbon stock change and emissions from forest cover change are available and updated annually (\cite{harris2021global}). The regular update intervals in the carbon data provide an opportunity to use spatial data to analyze land-based greenhouse gas emissions.

4.3. DATA QUALITY ASSURANCE

To ensure the integrity and reliability of data, the ET will provide significant oversight at each phase of data collection. Cloudburst will engage a local organization to conduct data collection through an open request for proposal process, with qualifications vetted through a review of experience, proposed personnel, and references. This process ensures transparency and market-based incentives for firms to provide competitive rates. The request for proposal will be shared directly with potential firms and in local papers and job boards.

The ET recommends that both household and women surveys be collected electronically. Electronic data collection allows the ET to enforce a wide range of constraints, validations, skip logic, and back-end quality control tools to ensure high-quality data collection. It also enables the upload of data daily from the field which allows for near-real-time monitoring and faster turnaround for data cleaning and analysis. For this IE, the ET recommends that surveys be conducted electronically using SurveyCTO, an electronic data collection program built upon the Open Data Kit platform, which is administered using Android devices in the field. The ET will program all survey instruments and perform multiple rounds of testing in-house, before enumerator training. Cloudburst's data collection partner will be able to download the survey on their devices for further desk-testing. Adjustments to the survey tool and programming will be made during enumerator training and pre-testing to improve and finalize the logic, constraints, and any other aspects of the programming.

After identifying a firm and completing contracting procedures, the ET will work closely with the firm to collaborate on writing and reviewing training plans, manuals, field plans, and data quality plans. The ET will work with Cloudburst's local data collection partner to translate instruments and protocols into Spanish.

Comprehensive training is also an important part of error prevention. The ET will oversee in person the data collection training, including the instrument pilot, prior to the baseline data collection launch. Cloudburst employs a training-of-the-trainers' method for enumerator training. This training will be led by local data collection partner personnel, such as the project manager, and will include supervisors and any other field-level leaders to ensure all local partner staff have an in-depth understanding of the study

objectives and all data collection tools. Following this, the enumerator training will be completed with Cloudburst presence as well. This training will include instruction on administering in-person surveys using SurveyCTO and the tablets used for data collection, surveying best practices, role-playing exercises, research ethics and Institutional Review Board (IRB) compliance, and performing a question-by-question review of all instruments that will be administered as part of the survey effort.

The training concludes with a field practice where enumerators complete practice surveys with a group of pilot households. Supervisors observe all enumerators during this practice to ensure they administer the informed consent and instruments appropriately, act professionally and ethically in the field, and are otherwise prepared to carry out the assignment. Feedback is also given to enumerators on ways to improve the administration of the assessment and survey, establish rapport with respondents, etc. Enumerators may also provide feedback on ways to strengthen the instruments and maximize their relevance to the local context, although most of this will have been completed during the earlier instrument pilot.

The ET will employ multiple data quality strategies in the field. Cloudburst will work with the data collection partner to ensure that data is comprehensively monitored during fieldwork to make sure that any issues can be raised and addressed while teams are still in the field. For example, Cloudburst mandates that survey data be checked on a nightly basis before the forms are uploaded to the server. In addition, 5–10 percent of surveys must be observed directly by supervisors and documented using an accompaniment form. Further, Cloudburst will require that the data collection partner also conduct surprise drop-ins and observation of enumerators while surveying during the duration of data collection.

Cloudburst will conduct data quality monitoring for the duration of data collection. Once data collection is underway, field teams must upload quantitative data to a shared server daily. Cloudburst adapts a high-frequency quality check Stata .do file and runs it on 100 percent of this data through these high-frequency checks—twice weekly at the start and once weekly thereafter—to establish a set of standard checks to monitor progress, interview duration, problematic response patterns, outliers, and other issues. Findings are fed back using standard templates to the local firm for reconciliation. Data is not considered accepted until all quality checks are fully reconciled. Cloudburst may also monitor other back-end quality control measures such as speed limits to catch instances where enumerators/respondents are speeding too quickly through the tool.

4.4. EVALUATION/IMPLEMENTING PARTNER COORDINATION

Throughout all stages of the evaluation, the ET will collaborate and communicate with the LfP SMVC implementing partner (IP), Tetra Tech. This coordination will include regular monthly check-in calls and reviews of all draft deliverables. Reciprocal exchange of information, including program progress, prompt problem-solving, consensus-building, and development of advocates for the research findings within the implementing organizations will ensure effective utilization.

5. DATA ANALYSIS

This section presents an overview of the strategy that the ET expects to use to estimate program impacts. Prior to data analysis, the ET will register a full pre-analysis plan with the Evidence in Governance and Politics network. A pre-analysis plan is expected to improve the rigor of quantitative analysis and reduce data mining by pre-specifying hypotheses, indicators, and models that will be used.

5.1. QUANTITATIVE ANALYSIS

CNP BORDER DELINEATION

Several forms of empirical analysis will be applied as part of the SRD approach:

1. Matching each treatment observation to its nearest spatial neighbor on the other side of the CNP border.
2. Normal regression discontinuity. Distance to the CNP boundary (positive for eligible observations, negative for ineligible), controlling for distance to the CNP boundary and distance interacted with eligibility.
3. Spatial fixed effects. These approaches are viable, in part due to the "sharp discontinuity" of the CNP border and the presence of granular remotely sensed data on/around the boundary.

As part of robustness checks for the analysis, the evaluation will present an interrupted time-series design for measuring deforestation beginning in 2016 through the end of the evaluation. This design is not as rigorous for assessing causal effects as the SRD design described above. Thus, it will be implemented as a supplement to the SRD. Finally, as a standard practice for conservation IEs, the evaluation will conduct placebo checks and spillover analysis (Kondylis and Loeser, 2019).

The evaluation will need to account for two methodological challenges with the SRD design. The first is testing comparability around the cutoff point.[38] Pre-intervention deforestation levels and trends should be balanced on average. If these trends differ, it will indicate awareness of the boundaries and that the new border is not a new feature (Albornoz et al., 2022). The ET will use matching to help mitigate bias.

The second issue is geographic spillover—effective resource protection within CNP leads to increases in deforestation in areas outside of the treatment area. Again, additional matching will be employed to conduct an analysis of spillover (e.g., Andam et al., 2008). Statistical matching will be used to identify untreated areas outside of the treatment areas to match untreated areas even further away; deforestation trends in these areas will be compared over time.

COMMUNITY-LEVEL FORMALIZATION PILOTS AND PUERTO RICO PARCEL SWEEP

The ET proposes a DID approach with matching and household fixed effects to explore potential effects of the LfP SMVC treatment in Puerto Rico and the community-level formalization pilots as part of the rigorous PE approach. The general frame of the DID estimator with panel data and fixed effects model is:

$$Y_{it} = \beta_1 Time_t + \beta_2 Treatment_{it} + \eta_i + e_{it,}$$

where Y is the outcome of interest at time t for household I and η are household-level fixed effects. The constant β_2 is the estimate of the treatment effect. Cluster robust standard errors will be used, by vereda, to account for serial correlation in responses across households within the same village. Robust standard errors (e_{it}) will be clustered at the vereda level, using Huber-White sandwiched standard errors (Lin, 2013).

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[38] Satellite imagery is available annually.

The DID approach controls for time invariant differences between treatment and control groups; this includes unobserved characteristics and those that have not been taken into account through the matching proposed below.

MATCHING TO MITIGATE BALANCE PROBLEMS

Matching techniques aim to mimic a randomized experiment by ensuring that the treatment and control groups have similar distributions in observed characteristics (Hainmueller, 2012). The aim of preprocessing with matching and reweighting is to improve the covariate balance between treatment and control groups. However, unlike randomized experiments, matching relies on the assumption of selection on observables—that all of the relevant variables used to assign treatment are included in the matching.[39] The team proposes comparing different techniques for matching and reweighting observations to improve balance during option period analysis. Following best practices, the team will select the matching procedure which yielded the best reduction in bias across the most important covariates for subsequent use in the matching approach (Austin, 2009).

First, the team will use propensity score matching, with weighting based on the Mahalanobis distance metric. Propensity score matching pairs treatment to control observations based on the estimated probability of assignment to treatment. The team will use logistic regression to estimate the propensity score in order to match treated and control households. The team will then discard unmatched control observations from the analysis. Finally, the observations are reweighted using the Mahalanobis distance metric. Combining the Mahalanobis metric with propensity score matching has been found to have preferable qualities to using propensity score matching alone (Rosenbaum and Rubin, 1985).

Second, the team will use propensity score matching with reweighting via a genetic algorithm (Diamond and Sekhon, 2013). This technique also matches based on the propensity score, but it uses an evolutionary search algorithm rather than the Mahalanobis distance metric to find weights for each covariate that optimizes covariate balance. Genetic matching often finds better balance than propensity score matching, and the estimations are typically less biased than those obtained via propensity score matching alone (Diamond and Sekhon, 2013).

Third, the team will employ entropy balancing, a technique for preprocessing data that reweights observations without matching (Hainmueller, 2012). As with matching, the user specifies a set of covariates that form the basis for a reweighting scheme. An entropy-balancing algorithm then finds weights for observations in the control group, and no matching or discarding of observations occurs. Entropy balancing reweights household observations in the control group to achieve balance across treatment and control groups on outcome indicators of interest. Following best practices, the team will select the matching procedure which yielded the best reduction in bias across the most important covariates for subsequent use in the matching approach (Austin, 2009).

5.2. GENDER AND OTHER SUBGROUP ANALYSIS

Understanding whether and how program impacts vary across a set of population and relevant context factors contributes to more effective programming decisions for future implementation. Based on the program theory and literature, the team expects to find variation in the treatment effect across a number

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[39] In most observational studies, this assumption is implausible because the process used to assign treatment is unknown. Fortunately, the team has some documentation of the process used by program implementers to select communities for the program, as described in the sampling section of this report.

of subgroups. Where sample size permits, the team will test outcomes for heterogeneous treatment effects across a number of household subgroups. This includes the following:

- Gender of the household head.
- Gender of the respondent.
- Household baseline landholding (continuous and land-constrained vs. others).
- Ethnic identification of the household head (Afro-Colombian and Indigenous vs. others).
- Households experiencing a land conflict or with prior experience of a land conflict.

To test for heterogeneous treatment effects across these subgroups, the team estimates the following equation:

$$Y_{it} = \beta_1 Time_t + \beta_2 Treatment_{it} + \beta_3 Treatment_{it} * Het_{it} + \beta_4 Het_{it} + \eta_i + e_{it},$$

Het_{it} is the indicator variable for the subgroup of interest. It is the marginal increase in treatment effect in aldeias/bairros in the subgroup under evaluation. All other parameters are the same as those described above for equation 1a.

For each of these groups of interest, separate panel DIDs with fixed effects will be conducted for each subgroup, and a z-score will be constructed from the difference in impact estimates for each group. The z-score can be interpreted as the number of standard deviations by which the effect sizes differ for the two subgroups. A difference of more than two standard deviations indicates that the difference in mean treatment across the two-group effect is not likely to be due to chance. This is interpreted as support for a significant difference in treatment effect between the two groups (for example, between impacts for female and male-headed households).

5.3. DESCRIPTIVE STATISTICS

Finally, for all performance outcomes or relevant contextual analysis that is supported by quantitative data, the team will present descriptive statistics and – where applicable – basic statistical tests of differences in means between treatment and comparison areas.

5.4. QUALITATIVE DATA ANALYSIS

All SSIs and FGDs will be translated from Spanish to English and de-identified to the fullest extent possible. The analysis will involve reading and re-reading the transcripts of the exercises and carefully coding and grouping responses in a consistent manner according to similar or related pieces of information presented, allowing comparison of responses and identification of common themes and trends.

Two ET members will be trained to code the qualitative data. To ensure reliability, both team members will code an initial transcript and compare codes to identify and resolve discrepancies. In addition, one ET member will review a subsample of coded data to check reliability as coding proceeds. Thematic coding will be accomplished manually in Microsoft Excel in a single master coding repository to ensure consistency and ease of reference. The ET will select quotations from the transcripts to illustrate the findings with simple, focused pieces of information representing key themes.

This qualitative data analysis process will allow the ET to organize and compare similar and related pieces of information in the qualitative data and to identify key themes and trends across the project area. The

analysis will therefore evaluate progress made on qualitative-only indicators, add depth and social context to inform the interpretation of the results of the quantitative analysis, and shed light on the multiplicity of perspectives and potential mechanisms surrounding outcomes of interest to the evaluation.

6. DISSEMINATION AND USE PLAN

The ET will be attuned to the interests and expectations of a wide range of audiences for this work, including policymakers, local government representatives, technical practitioners, and beneficiary stakeholders. All reports and data collection instruments are subject to review by stakeholders, including at USAID Land and Resource Governance, USAID Center for Democracy, Human Rights, and Governance (USAID/DRG), USAID/Colombia, and LfP/TetraTech prior to release. This sequential review process with stakeholders and USAID will facilitate feedback on drafts of each of the major deliverables, promote evaluation buy-in, and ensure the utility of results for diverse stakeholders. Table 7 below summarizes the dissemination and use plan in this evaluation.[40]

TABLE 7: LFP SMVC PE BASELINE DISSEMINATION AND USE PLAN

AUDIENCE	GOAL	TOOL/MEDIUM	TIMING
USAID/Washington	Technical oversight of evaluation Ensure alignment with USAID policies and research	Review of draft deliverables Monthly update meetings Outbrief presentation, presentation of baseline report, utilization workshop	Ongoing (throughout evaluation)
USAID/Colombia	Inform oversight/goals of LfP activity and broader GoC goals for deforestation and land governance Ensure appropriateness of evaluation to Colombian context	Review of draft deliverables Monthly update meetings Outbrief presentation, presentation of baseline report, utilization workshop	Ongoing (throughout evaluation)
LfP/TetraTech	Inform goals of LfP activity Potentially contribute insights to evaluation design and findings Ensure appropriateness of evaluation to Colombian and LfP context	Review of draft deliverables Monthly update meetings Outbrief presentation, presentation of baseline report, utilization workshop	Ongoing (throughout evaluation)
GoC	Apply evidence to national land governance and deforestation strategy	Presentation of baseline report	Post-baseline (once results are finalized)
Development practitioners	Contribute to the body of evidence on land governance activities to prevent deforestation	Potentially final report presentation Publicly available baseline report	Post-baseline (once results are finalized)

The ET will share the evaluation design report and the draft data collection tools with USAID and the LfP team and will update all parties regularly throughout the evaluation. The ET will collect and respond to

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[40] This dissemination and use plan covers baseline activities only, since those are the activities covered under this tasking, but the ET recommends maintaining this collaborative structure throughout the life of this evaluation.

one round of feedback on the proposed design and on the draft instruments. After baseline analysis is complete, the ET will share the results with USAID, the LfP team, and GoC representatives (two presentations). The ET will tailor these presentations to the intended audience and be interactive to engage the audience.

When cleared for public release, documents will be available on the USAID Development Experience Clearinghouse and de-identified data will be available in the Development Data Library. At the close of the evaluation baseline, the ET will produce a draft post-evaluation action plan to assist USAID in developing a plan to adopt and implement evaluation baseline recommendations. Finally, three and six months after completion of the baseline, the ET will contact a specified PoC at the Mission to understand how the results of the baseline are being used.

7. HUMAN SUBJECTS PROTECTION

The ET will ensure appropriate ethical clearance review of evaluation materials and research protocols used in the evaluation, including developing protocols to document the informed consent of research participants and obtaining IRB clearance for all data collection instruments and research protocols. The ET will obtain IRB approval for the data collection through the University of Pennsylvania IRB prior to any data collection efforts. The ET, with assistance from the local data collection partner and USAID, will also secure any additional permissions needed from government officials prior to the start of any data collection exercise.

8. RISKS AND LIMITATIONS

LIMITATIONS OF INTERPRETATIONS OF THE RESULTS

A key limitation of this evaluation design is that treatment was not assigned to geographies randomly. The random assignment of treatment theoretically ensures that, with an adequate sample size, the untreated control group's characteristics are similar on average to those of the treatment group. Randomization produces a valid counterfactual providing information on what would have happened to households in the treatment group had they not received the program intervention. Where random assignment is not feasible—such as in this evaluation—quasi-experimental IE design[41] options and rigorous PEs can be used to assess program impact or effectiveness. However, these designs rely on stronger assumptions about the comparability between treatment and control, making them vulnerable to omitted (unobserved) variable bias[42] and producing findings that are not as credible for causal inference. They often require statistical corrections to minimize selection bias between treatment and control groups. Due to the small number of communities in the evaluation, this evaluation is likely underpowered to detect changes in outcomes at the community level and household level (e.g., PPPs) that are confidently attributable to the program; however, the team will use the most rigorous approach possible to explore these trends and possible explanatory factors.

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[41] Quasi-experimental evaluation designs approximate an experimental design through the establishment of a control group that is similar to the treatment group on observable characteristics.

[42] Quasi-experimental evaluation and rigorous PE designs cannot prove that they have totally accounted for the effect of unobservable characteristics on assignment to treatment.

RISKS TO THE STUDY DESIGN

The ET has developed a plan to mitigate three key risks to the study design: those posed by the COVID-19 pandemic, security risks to the ET, and data collection challenges.

COVID-19

The evaluation will continuously monitor the progression of COVID-19 in-country to protect the safety of the data collection team and respondents. For any in-person fieldwork, the team will follow current health promotion guidelines on COVID-19. Cloudburst and the local data collection partner staff and participants in the interviews, FGDs, and in-person meetings will take place out of doors and the ET will instruct participants to wear masks and maintain two meters of distance. The team will make available a sanitizing station for arriving participants, have enough masks for any participants who may not have them, and advise local stakeholders and participants in advance of precautions in place to protect the participants and researchers. FGDs will be capped at 10 members, including two local data collection partner staff.

SECURITY

As discussed in prior sections, security conditions in the evaluation study area are generally poor and rapidly changing. Specifically, LfP documentation reports the existence of antipersonnel mines and a high territorial control of the First Front of former Revolutionary Armed Forces of Colombia—People's Army in community pilot area 1, and the existence of anti-personnel mines and fragile conditions of public order in community pilot area 2. The evaluation will approach baseline data collection with a strong security plan in place and update field plans according to the dynamics on the ground.

To ensure ET safety during data collection, the local data collection partner will complete a risk assessment and security plan that is customized to the final baseline communities one month prior to the data collection launch. This plan will take into consideration that security conditions vary at the municipal (urban and rural) and village levels and include analysis of the presence of armed groups/conflict and social conflicts at different levels (municipal and village).

Analysis of security threats will consider the extent and nature of activity in the area, as detailed in Table 8 (below). The local data collection partner's security plan will address each identified risk dimension with mitigation and contingency strategies. Key strategies that the ET anticipates employing include coordination and partnership with local authorities to facilitate community entry, preparation of evaluation plans/routes in the event that a field team needs to depart a location, and creation of protocols/training for avoiding and reporting areas with unexploded mines in the community formalization pilots. Cloudburst and the local data collection partner will also work with USAID and LfP to determine what other communication regarding security is advisable (for example, notifying LfP and/or the Colombia Fuerza Pública of field team movements).

TABLE 8: SECURITY ANALYSIS DIMENSIONS AND CONSIDERATIONS

SECURITY DIMENSION	COMMUNITY-LEVEL CONSIDERATIONS
Which armed groups have influence (Organized Armed Groups - GAO, Residual Organized Armed Groups - GAOR, Organized Criminal Groups - GDO, etc.)?	Degree of influence they exert.

SECURITY DIMENSION	COMMUNITY-LEVEL CONSIDERATIONS
What is the scenario of confrontation of the territory?	*High conflict:* Dispute between different groups (GAO, GAOR, GDO) for territorial control and illicit economies. *Medium conflict:* Presence of actors but without high-impact events (homicides, kidnappings, extortion, displacement, confinement and limitations on mobility). *Low conflict:* Areas with intermittent presence of groups (corridors of mobility), areas of low impact on the community.
What are the areas of greatest influence of armed groups and areas with disputes or violence?	Municipalities and villages most affected in terms of security and influence of armed groups.
How do armed groups affect the communities?	*Selective use of violence* (selective killings, individual threats, extortion, kidnapping). *Massive use of violence* (massacres, mass displacements, confinement). *Imposition of manuals of conduct and restrictions on everyday life.* *Use of violence against social leaders.*
Are illegal economies present in the territory?	Illegal economies (e.g., illicit crops, illegal mineral extraction, others).
Are anti-personnel mines and unexploded ordnances present in the area?	Level of demining work in the area.
Are there occurrences of violence targeting land system actors (leaders and social organizations, claimants and beneficiaries)?	Occurrence of threats, displacements, homicides.
What are residents' perceptions of the national and local governments? Of outside actors such as USAID?	Level of influence local governments exert (versus other local authorities). Decision whether to include USAID logo on survey materials.

Then, Cloudburst and the local data collection partner will continuously monitor the security situation in Colombia prior to and during data collection. Cloudburst retains the health and security firm International SOS, which helps assess risk and provide advice on mitigating security threats. In addition to bi-weekly briefings from International SOS, the team will monitor the U.S. State Department advisories and statements, the Armed Conflict Location & Event Data Project, local and international news, and local WhatsApp or Facebook groups, if relevant, to assess the environment and adapt surveying plans if security threats appear.

One week prior to data collection, Cloudburst and the local data collection partner will confirm the final list of communities included for field data collection based on the most up-to-date security information available. Once data collection begins, if the local data collection partner or any enumeration team member expresses discomfort or concern at any point about entering a community, in-person data collection will pause or not take place in that area. To allow the full measurement of evaluation indicators, the first choice will be to replace locales where field data collection is not feasible, but if this is not possible,

Cloudburst and the enumeration team will explore pivoting to phone data collection in limited instances where this may be feasible.

DATA QUALITY

Where security concerns necessitate remote surveying, there will be specific considerations for instrument design and field protocols. If needed, a separate training will focus on administering phone surveys to ensure enumerators who are less familiar/comfortable with phone surveying are confident in this approach. In terms of design, a phone survey necessitates a more targeted survey tool (e.g., short, concise questions, avoiding multiple responses). The team will draft additional protocols for confirming target respondents and recording refusals (for example, the number of calls before recording a non-response). The team seeks to avoid other limitations of remote surveying such as coverage error, non-response bias, and mode effects by restricting this mode to key stakeholders (rather than targeting households).

9. TIMELINE

The below Gantt chart (Table 9) summarizes the expected evaluation timeline by week.

TABLE 9: LFP SMVC EVALUATION BASELINE TIMELINE

ACTIVITY	ILLUSTRATIVE DELIVERABLE DATES	Nov					Dec				Jan				Feb					Mar					Apr				May				June				
		1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5
Final evaluation design report and workplan submitted	January 20, 2023												▓																							
Draft data collection instruments submitted	December 19, 2022- Janaury 3, 2023								▓	▓	▓																									
USAID provides feedback on draft data collection instruments	January 4-10, 2023										▓																									
Revised data collection instruments	January 13- 20, 2023											▓																								

ACTIVITY	ILLUSTRATIVE DELIVERABLE DATES	NOV 2022–MAY 2023																																			
		Nov					Dec				Jan				Feb					Mar				Apr				May				June				
		1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5
Field preparations, including obtaining necessary permissions; programming, translating, testing, and piloting the interview instrument and survey; obtaining IRB approval and preparing introduction letters for interviews	December 2, 2022– February 10, 2023					■	■	■	■	■	■	■	■	■	■	■																				
Baseline data collection training	February 13-17, 2023																■																			
Baseline data collection	February 20-March 17, 2023																	■	■	■	■															
Analysis and preparation of initial findings presentation	March 20-April 14, 2023																						■	■	■											

ACTIVITY	ILLUSTRATIVE DELIVERABLE DATES	NOV 2022 MAY 2023																																	
		Nov					Dec				Jan				Feb					Mar				Apr				May				June				
		1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5
Out-brief to present initial findings to USAID	On/about April 14, 2023																								■											
Draft baseline report with preliminary findings	May 5, 2023																											■								
Receive feedback on the draft evaluation report	May 19, 2023																														■					
Final report and comment matrix submitted	June 2, 2023																														■					
Presentation of final report to core stakeholders	On/about June 21, 2023																																		■	
Utilization Workshop	On/about June 21, 2023																																		■	
USAID evaluation report approval	June 21, 2023																																		■	

ACTIVITY	ILLUSTRATIVE DELIVERABLE DATES	NOV 2022–MAY 2023							
		Nov	Dec	Jan	Feb	Mar	Apr	May	June
		1 2 3 4 5	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4 5	1 2 3 4	1 2 3 4	1 2 3 4 5
Updated post-evaluation action plan (draft only)	June 28, 2023								■ (wk 5)
Submission of the final report to the Development Experience Clearinghouse and of data to the Development Data Library	June 21, 2023								■ (wk 4)
Final project closeout	June 21, 2023								■ (wk 4)

10. RESEARCH TEAM

Below is the proposed composition of the ET:

Team Lead Kate Marple-Cantrell will lead the drafting of the design report, including development of the research methodology, baseline data collection, data analysis, and baseline report writing. She will also lead the in-brief and out-brief with USAID at the beginning and end of fieldwork

Governance and Conservation Expert Heather Huntington will contribute subject matter expertise on issues of land tenure and governance. She will advise the team on methodology development and tool development and review deliverables.

Evaluation Specialist Miriam Counterman will support the team leader and governance and conservation expert and support development of the research methodology, design data collection tools, and support data collection and analysis.

Local Researcher Lain Pardo will support the team leader, governance and conservation expert, and evaluation specialist to design and execute the selected evaluation approach, with emphasis on supporting the measurement of biodiversity outcomes. He will contribute deep knowledge of the context and contribute to all deliverables.

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APPENDIX A: DRAFT STATEMENT OF EVALUATION STAKEHOLDER ROLES

Statement of Evaluation Stakeholder Roles
Between Cloudburst, USAID (USAID/DRG and USAID/Colombia), and TetraTech on the LfP SMVC Impact and Performance Evaluation

I. PURPOSE AND SCOPE

The purpose of the Statement of Evaluation Stakeholder Roles is to confirm the roles, responsibilities, and commitments of the ET (fielded and managed by Cloudburst), USAID (USAID/DRG and USAID/Colombia), and TetraTech as they relate to the implementation of a rigorous mixed-methods impact and performance evaluation of the LfP program in SMVC. The period of performance of this evaluation is November 3, 2022, to June 21, 2023.

II. BACKGROUND

The LfP activity builds on prior USAID investments in the land sector in Colombia and is intended to improve the conditions of conflict-affected rural households in a sustainable manner. The goal of implementation in SMVC is to explore methods that focus on the integration of three thematic areas— licit, sustainable livelihood promotion, land formalization, and environmental conservation, with a particular focus on changing behaviors associated with deforestation and biodiversity conservation.

The evaluation will establish baseline measures to assess the EQs and inform USAID's learning interests. To achieve this, the evaluation will employ a rigorous mixed-methods impact and performance evaluation design, including quantitative and qualitative methods, to provide multiple levels of triangulation. To the extent technically feasible, the evaluation will use a quasi-experimental IE component to investigate EQ3 (the CNP Border Delimitation and Enforcement component).[43] The evaluation will address the three intervention types discussed above: Community Formalization Pilots, Puerto Rico Parcel Sweep, and CNP Border Delimitation and Enforcement.

III. JOINT ROLES AND RESPONSIBILITIES OF THE PARTIES

The parties will provide each other with all such information as may be necessary to facilitate the implementation of the evaluation. The evaluation will require close coordination between Cloudburst, USAID, and TetraTech. Any issues concerning the interpretation, administration, or implementation of this statement will be resolved by timely consultation between the parties.

IV. INDIVIDUAL ROLES AND RESPONSIBILITIES OF THE PARTIES

A. RESPONSIBILITIES AND COMMITMENTS OF CLOUDBURST

- Design the overall evaluation strategy and baseline and endline surveys in identified sites:
    - Select comparison geographies in coordination with USAID and TetraTech.
    - Define protocols necessary to measure changes resulting from program/project interventions.

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[43] If it is not possible to preserve the counterfactual for avoided deforestation outcomes, then the evaluation will switch back to a PE.

- Design the survey instrument and protocols (including field testing).
- Design the sampling strategy.
- Design the data collection instruments and related manuals.
- Identify and select survey firms to carry out data collection.
- Analyze survey data and produce baseline report representing findings.
- Provide regular and timely updates on the progress of evaluation activities.
- Follow agreements for the length of review timelines by USAID and Tetra Tech (see evaluation timeline).
- Take under consideration comments and questions of USAID and Tetra Tech staff, while maintaining evaluator independence.

- Ensure confidentiality of all information and documentation shared with the researchers over the course of the evaluation. In particular, Cloudburst will:
  - Obtain human subjects approvals from all required ethics review boards/IRBs before beginning data collection activities.
  - Ensure that all ET members do not engage in unauthorized sharing or dissemination of any proprietary or confidential information related to the Mission's activities as well as any personal records or identifiable information of individuals participating in the study.

- Disseminate evaluation results to promote utilization and learning.
  - Share with USAID and TetraTech preliminary baseline findings from the evaluation for inputs and comments before final versions of the reports are made public. Remove all personal identifiers before any such release.
  - The ET may use the data from this evaluation in academic publications, including journal articles and/or PhD dissertations.

B. RESPONSIBILITIES AND COMMITMENTS OF USAID

- Provide technical oversight to the overall evaluation strategy and evaluation activities.
- Provide timely feedback on all deliverables shared for comment.
- USAID/Colombia will be responsible for securing the firm commitment of all stakeholders involved in the program/project to do a rigorous evaluation and to fully cooperate with Cloudburst in all aspects of the evaluation process.
- USAID/Colombia will liaise with the GoC about this evaluation to ensure host government ownership and buy-in.
- Support Cloudburst in obtaining all needed permissions to conduct data collection; for example, by producing an official letter of support for the evaluation.
- Ensure that Cloudburst has access to the relevant (not classified) program or project information to design the study adequately.
- Allow Cloudburst to operate with complete independence to ensure the integrity of the evaluation process and results.
- USAID/Colombia will ensure that every IP understands that a rigorous evaluation requires that project activities be rolled out according to specific protocols and procedures that must be strictly followed and that partners work closely with researchers to develop work plans that enable the evaluation. In particular:

- Ensure that the rollout of program and project activities takes place as agreed in the evaluation design.
- Should the parties determine that adjustments in program/project implementation are necessary for the success of the evaluation, commit to requesting and securing such changes with IPs.

C. RESPONSIBILITIES AND COMMITMENTS OF TETRA TECH

- Provide timely feedback on all deliverables shared for comment.
- Commit to supporting a rigorous evaluation and fully cooperate with Cloudburst and the DRG Evidence and Learning Team on all aspects of the evaluation process.
- Appoint a point of contact to communicate regularly with the ET and provide programming progress updates, problem-solving, and consensus-building on program and evaluation activities.
- Ensure that Cloudburst has access to relevant (not classified) program or project information in order to design the study adequately.
- Allow Cloudburst to operate with complete independence to ensure the integrity of the evaluation process and results.
- Follow all evaluation protocols and procedures and ensure that partners work closely with Cloudburst to develop work plans that enable the evaluation. In particular:
    - Ensure that the rollout of program and project activities takes place in sites as agreed in the evaluation design. In the event that changes to the interventions, timeline, or geographies are necessary, Tetra Tech will seek to minimize changes that would negatively affect the evaluation, as feasible within Tetra Tech's control and need to meet performance objectives set by USAID, and ensure that Cloudburst knows about these with as much advance as possible so that the evaluation can take them into account.
- Incorporate indicators requested by Cloudburst into monitoring data collection plans (if agreed upon) and provide the ET with timely access to all program monitoring information.
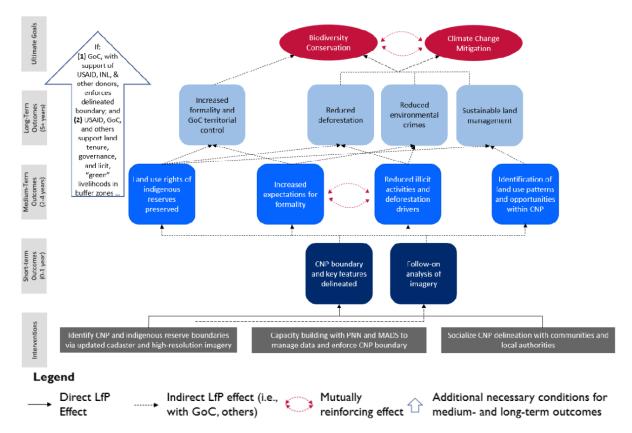
V. MODIFICATIONS

This statement may only be amended through the written agreement of the parties. Items within this statement can be added and subtracted through mutual agreement and a record of changes will be kept in an accompanying knowledge management document.
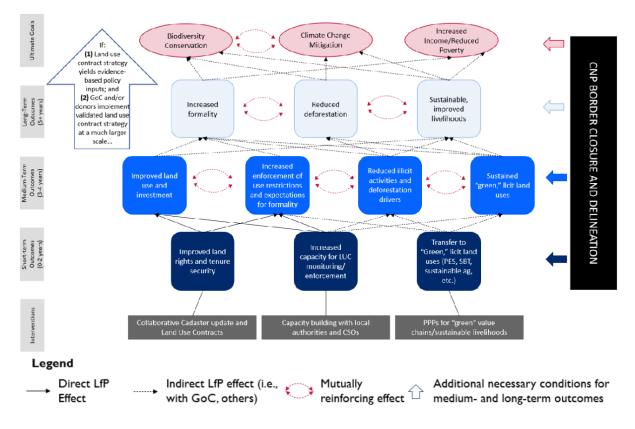
APPENDIX B: BASELINE REPORT OUTLINE

   I.   Executive Summary
- A. Findings and Conclusions
- B. Recommendations

  II. Background

 III. Evaluation Methods and Limitations
- A. Evaluation Purpose
- B. Data Collection
- C. Data Analysis
- D. Limitations and Mitigation

 IV. Findings
- A. Delineation of CNP Border and Key Features Therein
    1. Local Land Governance, Environmental Governance, and Environmental Crime and Corruption
    2. Deforestation, Habitat Connectivity, and Biodiversity Conservation
- B. Community-Level Formalization Pilots
    1. Tenure Security
    2. Land Use Behavior
        a) Monitoring and Enforcement of Land Use Restrictions
        b) Land Investment
    3. Participation in Sustainable, Licit Livelihoods
    4. Deforestation, Biodiversity
- C. Puerto Rico Parcel Sweep
    1. Land Administration and Governance
    2. Tenure Security
    3. Land Use Behavior
        a) Monitoring and Enforcement of Land Use Restrictions
        b) Land Investment
    4. Participation in Sustainable, Licit Livelihoods
    5. Deforestation, Biodiversity

  V. Conclusions

 VI. Recommendations

 VII. Annex A: Full List of Evaluation Indicators

VIII. Annex B: Data Collection Instruments

 IX. Annex C: Design Report

  X. Annex D: Descriptive Tables

 XI. Annex E: Regression Tables

 XII. References

APPENDIX C: EXPANDED PROJECT TOCS

Figure 9: CNP Border Delineation

Figure 10: Community-Level Formalization Pilots

Legend

→ Direct LfP Effect

--→ Indirect LfP effect (i.e., with GoC, others)

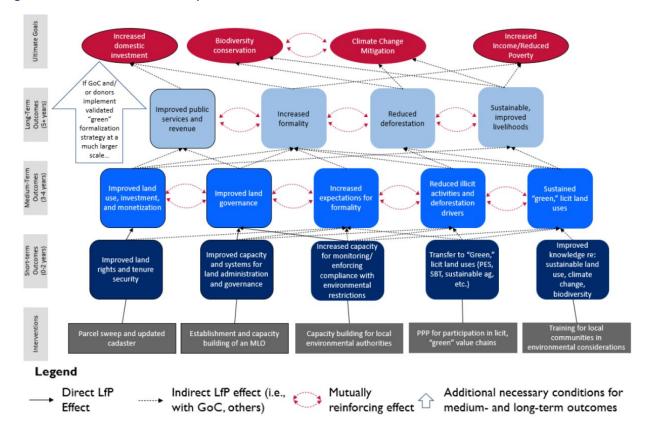⟷ Mutually reinforcing effect

⇧ Additional necessary conditions for medium- and long-term outcomes

Figure 11: Puerto Rico Parcel Sweep

Legend

→ Direct LfP Effect

┈┈▸ Indirect LfP effect (i.e., with GoC, others)

⟿ Mutually reinforcing effect

⇧ Additional necessary conditions for medium- and long-term outcomes