

Forest Carbon Partnership Facility (FCPF)

Carbon Fund

Emission Reductions Program Document (ER-PD)

**ER Program Name and Country: REDUCING EMISSIONS FROM
SAN MARTIN AND UCAYALI IN THE PERUVIAN AMAZON, PERU**

Date of Submission or Revision: June 03, 2019

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Executive Summary

The Emission Reduction Program (ERP) is expected to generate 26,774,276.7 tCO₂e of emission reductions from the accounting area during the 2020-2024 accounting period. Excluding the calculated 15% uncertainty factor for the degradation activity, any factor for the deforestation activity and the 24% buffer for reversals, the net “ex-ante” estimated GHG emission reductions amount to 21,592,158.7 tCO₂e during 5 years. Peru expects to transfer 6,400,000 tCO₂e of these emissions reductions to the Carbon Fund.

This proposed Program is the sole proposal to the Carbon Fund from the Amazon Basin and is representative of many of the problems and potential solutions existing in this biome. Emission reduction efforts will concentrate on the accounting area composed of the Amazonian regions of San Martin and Ucayali. Both regions contributed a disproportionate share (35%) of the deforestation in the Peruvian Amazon between 2008 and 2017, but are also at the forefront of low emissions development there. The accounting area contains about 12.7 million ha of forests (equivalent to 19% of Peru’s Amazonian forests - 68.6 million ha), of which more than 3 million are found in indigenous communities. Ucayali has more forests (9.3 million ha) and is less developed and less populated than San Martin (3.3 million ha of forests) and has larger number of indigenous communities (273 vs. 89 in San Martin). The two regions are in the lower half of Peru’s Human Development Index national ranking.

The ER Program will address the main direct drivers of deforestation and forest degradation – expansion of the agricultural frontier based on extensive agricultural land use (principally for coffee, cocoa, and oil palm), land speculation, and legal and illegal logging, and the underlying macro-economic forces (migration, markets) and institutional and productive barriers and weaknesses. It will implement a territorial-based production-protection-inclusion model that is more intensive, more sustainable, more equitable, and less carbon-dependent than the current paradigm. In so doing, it is expected that the Program will impact more than about 2.5 million ha of forest and almost 100,000 agricultural ha, thereby benefiting directly or indirectly approximately 380,000 rural inhabitants, many with traditionally low participation in development activities: the private sector, women, small farmers, migrants/subsistence level producers, indigenous communities, producer organizations, and land speculators. Regional governments are also key, both as beneficiaries as well as implementers of interventions.

The overall political context of the Program is favorable since Peru has defined deforestation and land use change goals in the Amazon in the framework to achieve its Nationally Determined Contributions. Recent approval of environmental and forestry laws, the implementation of a forest and climate change strategy, multi-sectorial and inter-level efforts to improve sustainable development in the Amazon and governance of forests and climate change, and regional government efforts to adopt a forest conservation - sustainable production approach to low emissions development provide a solid base and lend support to the Program interventions contemplated.

The overall intervention strategy is based on the alignment of active or planned, large, internationally funded projects and various smaller ones with international or regional funding, which address various aspects of deforestation. Moreover, it will layer new activities onto these projects in order to foster and complement their efforts and align them with ER Program goals and results. The Program will also incorporate Peru’s natural and commercial advantages, especially the large amounts of natural capital present and the experiences with de-commoditized production. Additionally, it will employ a host of

innovative tools that are being developed at the national and regional levels, including: payments for conservation to indigenous communities (TDCs), regional branding, the leveraging of regional development fiduciary funds such as FONDESAM as credit guarantees, access to concessional finance linked to carbon performance ("low rates for low emissions"), contracts for the cession of rights to agroforestry and forestry producers, the recognition of community rights to local forests, the establishment of economic identity and value chain traceability based on blockchains, and multi-stakeholder and investment promotion platforms.

Interventions are organized along 4 strategic lines: 1) Increases in conservation and the value of forests, 2) Increases in productivity, sustainability and competitiveness of climate friendly agroforestry production systems, 3) Off-farm employment creation through promotion of investments in green businesses, and 4) Improvement of institutional enabling conditions. Principal activities include the assignment of land and forest rights, forest conservation, sustainable forestry, intensified subsistence and commercial agricultural production, promotion of investments and off-farm employment, and improvements in underlying productive and institutional/legal enabling conditions to reduce the pressure on forests. They will be focused on approximately 30 districts where deforestation and forest carbon stocks are high or where forests are under threat of disappearing, and on land tenure categories with high deforestation rates (forests with unassigned rights, forest concessions, indigenous territories, and farms).

The interventions in forest areas are expected to produce about 19,068,630.2 tCO₂e of emissions reductions, intensification of production systems about 7,518,257.9 tCO₂e of emissions reductions, and promotion of investments and employment, 187,388.6 tCO₂e of emissions reductions. From a carbon emissions reduction standpoint, land classification and titling is the most efficient intervention, followed by conservation in ANPs, improved community governance of forests, and transitioning subsistence or migrant farmers to more commercial and sustainable agroforestry systems., sustainable forest management, and intensification of coffee and cocoa. Other interventions create significant increases in economic well-being and employment, with little impact on emission reductions. Under a low emissions development approach, however, both types are needed.

Although some of the improved enabling conditions do not directly produce major emissions reductions, they play a key role by ensuring that economic development does not ultimately cause more deforestation. They include: improving institutional resources and capacities, institutional coordination and policies, improved access and use of information, land use monitoring, control, and enforcement. Other enabling activities such as the assignment of rights, the use of cession of use contracts, the strengthening of producer associations, productive technical assistance, improvements in the access to credit and markets, and the use of incentives are key to many of the productive interventions. The mix of interventions results in almost complete geographic coverage of the accounting area and lessens the possibility that unattended areas will continue to contribute to forest-based emissions.

The potential positive impacts of the Program far outweigh the potential negative impacts. To a large measure, Program design elements are expected to reduce risks due to displacement and reversions. Potential land tenure conflicts are expected to be reduced by on-going titling programs, participation of indigenous peoples in this process and various institutional strengthening and coordination mechanisms. Eight World Bank environmental and social standards (ESS 1-3, 5-8, and 10) apply to the potential negative impacts and risks associated with the interventions. All are supported by Peru's legal and policy framework. The standards that deserve most attention are related to compliance with legal standards,

participation, and land rights, especially of indigenous peoples. However, further stakeholder consultations are needed to validate proposed safeguards and mitigating measures and work remains in order to construct a safeguards monitoring and response system.

The existing prototype Citizen Attention Mechanism (MAC – grievance mechanism) will be further developed during 2019. The prototype is based on national and regional experiences that will be expanded and improved. Other support tools for safeguards implementation that are under development or validation include: the plan for the participation of actors and indigenous peoples, the safeguard information system, and local safeguard monitoring. Equally important, not only for safeguard protection, but for overall implementation, is the continuation of on-going participatory dialogue and consultations through evolving communication mechanisms and structures, as well as the MAC presently being designed. It must be highlighted that San Martin already has an operational Regional System for Environmental Complaints (SIREDA), with a legal basis, clear procedures and timeline, and transparent reports to users and the general public. SIREDA, with other platforms and the regional safeguards committee should be the basis of San Martin's MAC. Roadmaps for both regions have been agreed upon with regional governments and stakeholders.

With regards to benefit distribution, the principal elements of a plan have been identified: the identification of beneficiaries, the form of benefits, the distribution of benefits among the actors, and the criteria used in order to determine magnitude of the benefits; these elements need to be consulted and fleshed out. Potential beneficiaries include four groups of actors who are holders of enabling titles to forests, as well as other actors outside of the forests who are part of the processes responsible for deforestation and whose action is key to its reversal. Benefit sharing criteria are still under construction since they present a number of challenges due to potential free-rider effects or the lack of rewards for groups that effectively reduce emissions. Financial mechanisms for results-based payments and distribution channels also need further definition. These design elements are expected to be determined by mid-2019 and will be subsequently consulted with stakeholders in order to have a final design by the signing of the ERPA. An explicit roadmap has been agreed upon with both regional governments, who have designated their representatives for a working group with MINAM charged with preparing the draft proposal of the Benefit Sharing Mechanism that will be consulted with stakeholders and finally approved.

Various non-carbon benefits were identified by participatory processes. Of these, habitat defragmentation/connectivity, institutional coordination, and off-farm employment promotion in green businesses were selected since they derive directly from Program activities and reflect the "health" of the environmental, institutional, and socio-economic areas. These benefits need to be validated by stakeholders. Annual measurement and monitoring will be based on existing capacities, but the procedures for local monitoring need to be specified.

Legal rights to forest resources (that include forest environmental services) clearly pertain to the State, but can be ceded to legal users of the forest. To do that, the State not only regulates and registers them, but can also determine the participation of individuals in the benefits created by their actions for the maintenance of such services. In the case of carbon services (i.e. carbon sequestration and storage and carbon emission reductions), MINAM is the responsible entity for supervising, promoting, and regulating their compensation and for developing and defining the rules of a registry for these services. Registration in this registry would confer Emission Reduction rights which could enable their eventual transfer by holders of REDD+ projects and others.

With regards to the power of MINAM to sign the ERPA on behalf of the Peruvian State, there are no specific rules or regulations to such effect. However, MINAM has decided to pursue the issuance of a legal norm which would enable the Ministry to sign the ERPA and transfer the rights of emission reductions to the Carbon Fund.

In order to register emissions reductions, Peru is opting to use its National Registry of Mitigation Initiatives (NRMI). Registry design is under way via a consultancy by IHS Markit. The Registry will form part of the national MRV system and will contribute to the bottom up compliance of the NDCs as well as the monitoring of progress of NAMAs. MINAM will be responsible for the Registry and within MINAM the DGCCD will validate the contents of the registry and will manage and make public information on the reductions of GHG emissions. Information contained in the Registry will be used by MINAM to prepare National Communications and Biennial Reports. Internal details and procedures are still under development, but technical design of the Registry will be presented to stakeholders for joint approval in June 2019; at that point the next steps for implementation will be established. Collaboration with the World Bank's registry is also contemplated. Due to the complex nature of the groundwork required in order to establish a national registry, Peru may use the Carbon Fund registry during the initial years of the accounting period, until the national registry is up and running.

The proposed budget for the ER Program is US\$ 226.155 million, including the public and private investments estimated to be implemented during the six-year execution period, 2019 – 2024 (a preparatory period of one year and five years of intervention). Most of these costs are for implementation - US\$ 211.019 million (93.3%) and financing - US\$ 9.645 million (4.3%). Private sector investments represent by far the majority (US\$ 186 million, equivalent to about 82%) of the ER Program costs, compared to the almost US\$ 40 million contributed by international projects and public budgets. Most of the private sector investment is comprised of out-of-pocket costs (about US\$ 120 million) related to forest and agroforestry production. These investments will be enabled by activities of various projects working with the private sector, improvement in the access to credit, and greater profitability of production systems as a result of the ER Program interventions. Additionally, another US\$ 32 million are estimated to be contributed by 4 reforestation or other companies, and US\$ 34 million from credit during the accounting period.

An estimated US\$ 317,726,494 in financing will be generated, mainly (59%) from the sale of products from productive systems (US\$ 188,203,252 million). Other financing includes: US\$ 35.674 million from projects, US\$ 34 million in credit including US\$21 million from CAF for business - community reforestation (negotiations are underway), US\$ 32.062 million in investments from private sector businesses, US\$ 32 million in expected payments for emissions reductions from the Carbon Fund, and US\$ 4.310 million from public budgets.

The Program is expected to generate a surplus of US\$ 90,004,632. This positive economic result is robust across all levels of variables tested in economic and financial sensibility analyses. However, there is an institutional deficit that totals US\$ 11.70 million, due to preparation and REDD+-related institutional and transaction costs and new activities. It is estimated that \$1.66 million of this gap could be financed from the additional US\$ 5 million in R-PP funding recently received by the country and by regional PIPs that are presently in the public financing pipeline.

Acronyms

Acronym	Meaning
ACR	Regional Conservation Area
AGB	Aboveground Biomass
AGROIDEAS	Compensation for Competitiveness Program
AGRORURAL	Program for Agrarian Rural Productive Development
AIDSESP	Interethnic Association for the Development of the Peruvian Amazon Forests
ALD	Local Development Agency
ANA	National Water Authority
ANP	Protected Natural Area
APPCACAO	Peruvian Association of Cocoa Producers
ARA	Regional Environmental Authority
ARD	Regional Development Agency
ATFFS	Forestry and Wildlife Technical Administration
BAU	Business-as-usual
BGB	Belowground Biomass
BSM	Benefit-Sharing Mechanism
BUR	Biennial Update Report
CAF	Andean Community Development Bank
CAM	Municipal Environmental Committees
CAR	Regional Environmental Committees
CB	Compensation Baseline
CDM	Clean Development Mechanism
CEDISA	Center for Development and Research of the High Jungle
CENAGRO	National Agriculture and Livestock Census
CEPLAN	National Center for Strategic Planning
CER	Certified Emissions Reductions
CGBCC	Committee for Forest and Climate Change Governance
CGFFS	Forest and Wildlife Management Committee
CI	Conservation International
CF	Confidence Interval
CIAM	Amazon Interregional Council
CIAT	International Center for Tropical Agriculture
CITECACAO	Center for Productive Innovation and Technology Transfer for Cocoa
CITES	Convention on International Trade in Endangered Species
CLU	Changes in Land Use
COFIDE	Development Finance Corporation
CONAFOR	National Forest and Wildlife Council
CONAP	Peruvian Confederation of Amazonian Nations
CONFIEP	National Confederation of Private Business Institutions
COP	Conference of the Parts
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CO _{2e}	Equivalent carbon dioxide
DBH	Diameter at Breast Height
DCI	Joint Declaration of Intent
DDE	Economic Development Directorate of the regional governments
DEVIDA	National Commission for Life and Development Without Drugs
DGAAA	General Directorate of Agrarian Environmental Affairs
DGCCD	General Directorate for Climate Change and Desertification
DGEVFPN	General Directorate of Natural Heritage Assessment, Valuation, and Financing

Acronym	Meaning
DGFFS	General Forestry and Wildlife Directorate
DGOT	General Directorate for Land Use Zoning
DGM	Dedicated Grants Mechanism
DIGESPACR	General Directorate of Legal Titling of Agrarian Property and Rural Land Registry
DRA	Regional Agrarian Directorate
DRDE	Regional Economic Development Directorate
DRFFS	Regional Forestry and Wildlife Directorate
EAP	Economically Active Population
EF	Emissions Factor
EIA	Environmental Impact Assessment
ENBCC	National Forest and Climate Change Strategy
ENCC	National Climate Change Strategy
ER	Emissions Reductions
ERP	Emissions Reduction Program
ERPA	Emissions Reduction Payment Agreement
ERPD	Emissions Reduction Program Document
ER-PIN	Emissions Reduction Project Idea Note
ESMF	Environmental and Social Management Framework
ESA	Strategic Environmental Assessment
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FIP	Forest Investment Program
FOGAPI	Guarantee Fund for Loans to Small Industry
FONCODES	Social Development Cooperation Fund
FONDESAM	Amazon Development Fund
FREL	Forest Reference Emissions Level
FRL	Forest Reference Level
GCFTF	Governors' Climate and Forest Task Force
GDPI	General Directorate of Indigenous Peoples
GEF	Global Environmental Facility
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas Emissions
GFOI	Global Forest Observations Initiative
GMT	Multisector Working Group
GNP	Gross National Product
GOLO	Local governments
GOP	Government of Peru
GORE	Regional government
GORESAM	Regional government of San Martin
GOREU	Regional government of Ucayali
GRP	Gross Regional Product
GTDRBE	Working Group for Low Emissions Rural Development
ha	Hectares
HDI	Human Development Index
IDB	Inter-American Development Bank
ICRAF	World Agroforestry Center
ICT	Information and Communication Technology
IDER	Regional Spatial Data Infrastructure
IFI	Intermediary Financial Institution
IIAP	Peruvian Amazon Research Institute
IKI	International Climate Initiative

Acronym	Meaning
ILO	International Labor Organization
iMRV	Indigenous Monitoring, Reporting, and Verification
INEI	National Institute of Statistics and Information
InfoCarbono	Reporting mechanisms for the National Inventory of Greenhouse Gases
INGEI	National Inventory of Greenhouse Gases
INIA	National Institute for Agrarian Innovation
InterCLIMA	Exchange for the management of climate change, MINAM
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
IRSA	Initiative for the Integration of the Regional Infrastructure of South America
ITMO	Internationally Transferred Mitigation Outcome
JICA	Japanese International Cooperation Agency
JNC	National Coffee Junta
KfW	German Development Bank
LMCC	Framework Law on Climate Change
LU	Land Use
LULUCF	Land use, land-use change and forestry
MAC	Mechanism for Citizen Attention
MARENASS	Project for Natural Resource Management in the Southern Sierra
masl	Meters above sea level
MCES	Mechanism for the Compensation of Ecosystem Services
MEF	Ministry of Economy and Finances
MERESE	Contribution Mechanism for Environmental Services
MFC	Community forest management
MFS	Sustainable forest management
MIC	Multisector and Intergovernmental Commission for the Establishment of Priority Public Actions for the Promotion of the Sustainable Development of the Amazon Regions
MIDI	Ministry of Development and Social Inclusion
MINAGRI	Ministry of Agriculture and Irrigation
MINAM	Ministry of the Environment
MINEM	Ministry of Energy and Mines
MINCETUR	Ministry of Foreign Commerce and Tourism
MINCUL	Ministry of Culture
MMCB	Module for the Monitoring of Forest Cover
MRV	Monitoring, Reporting, and Verification System
Mt	Metric tons
MtCO ₂ e	Million Tons of Carbon Dioxide equivalents
NAMA	Nationally Approved Mitigation Action
NDC	Nationally Determined Contributions
NFI	National Forest Inventory
NGO	Non-governmental organization
NICFI	Norway's International Climate and Forest Initiative
NPV	Net Present Value
NORAD	Norwegian Agency for Development Cooperation
NRF	National Reference Level
NRMI	National Registry of Mitigation Initiatives
OECD	Organization for Economic Cooperation and Development
OEFA	Office of Environmental Evaluation and Control
ONAMIAP	National Organization of Andean and Amazonian Women of Peru
OPIP	Office for the Promotion of Private Investment

Acronym	Meaning
OSINFOR	Supervisory Body for Forest and Wildlife Resources
PCM	Presidency of the Council of Ministers
PDA	Alternative Development Program
PDRC	Regional Consensual Development Plans
PES	Payments for Ecosystem Services
PIN	Program Idea Note
PIP	Public Investment Project
PMU	Program Management Unit
PNCB or PNCBMCC	National Program for Forest Conservation and Climate Change Mitigation
PNP	National Police of Peru
PPF	Permanent Production Forests
PPI	Protection-Production-Inclusion
PPIA	Plan for Stakeholder Participation and Engagement
PPS	Sustainable Landscapes Project
PRODUCE	Ministry of Production
PromPeru	Commission for the Promotion of Exports and Tourism of Peru
PTRT3	Rural Area Land Cadastre, Titling, and Registration Project, Phase 3
QA/QC	Quality Assurance/Quality Control
RAGEI	Annual Report of Greenhouse Gases
RCC	Regional Coordination Council
REDD+	Reducing emissions from deforestation and forest degradation
RIA	Amazonian Indigenous REDD+
RNIM	National Registration of Mitigation Initiatives
R-PIN	Readiness Program Idea Note
R-PP	Readiness Preparation Proposal
RSPO	Responsibly Sourced Palm Oil
SDG	Sustainable Development Goals
SDM	Sustainable Development Mechanism
SERFOR	National Forest and Wildlife Service
SERNANP	National Natural Protected Areas Service
SESA	Strategic Environmental and Social Assessment
SINANPE	National System for Natural Protected Areas
SINIA	National Environmental Information System
SIS	Safeguard Information System
SM	Region of San Martin
SNIFFS	National Forestry and Wildlife Information System
SNMCCB	Nation System for Forest Cover Monitoring
SRC	Regional Conservation System
TA	Technical Assistance
tCO ₂ e	Tons of carbon dioxide equivalents
TDC	Conditioned Direct Transfer Payments
UC	Region of Ucayali
UGFFS	Forest and Wildlife Management Units
UMD	University of Maryland
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UN REDD	United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
UV	Ultra-violet

Acronym	Meaning
VCS	Verified Carbon Standard
VER	Voluntary Emission Reductions
WB	World Bank
WWF	World Wildlife Fund
ZAE	Agroecological Zoning

1. ENTITIES RESPONSIBLE FOR THE MANAGEMENT AND IMPLEMENTATION OF THE PROPOSED ER PROGRAM

1.1 ER Program Entity that is expected to sign the Emission Reduction Payment Agreement (ERPA) with the FCPF Carbon Fund

Name of entity	Ministry of the Environment (MINAM)
Type and description of organization	National government ministry
Main contact person	Lucia Ruiz Ostoic
Title	Minister
Address	Av. Antonio Miro Quesada (ex Juan de Aliaga) 425 - 11 ^o Piso - Magdalena del Mar. Lima Peru
Telephone	(01)6116000 Annex 1004
Email	lruiz@minam.gob.pe
Website	www.gob.pe/minam

1.2 Organization(s) responsible for managing the proposed ER Program

Same entity as ER Program Entity identified in 1.1 above?	Yes
If no, please provide details of the organizations(s) that will be managing the proposed ER Program	
Name of organization	
Type and description of organization	
Organizational or contractual relation between the organization and the ER Program Entity identified in 1.1 above	
Main contact person	
Title	
Address	
Telephone	
Email	
Website	

1.3 Partner agencies and organizations involved in the ER Program

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
National Government Authorities and Institutions		
Ministry of Agriculture and Irrigation (MINAGRI)	Fabiola Martha Muñoz Dodero Minister Tel.: 209-8600, Annex: 1112 – 1114 Email: fmunoz@minagri.gob.pe	Governs national agricultural and forestry policy and the formalization of agrarian property, including indigenous lands and private rural holdings. <i>Role:</i> Participates in overall strategies and program coordination. Formulates and implements agricultural and forestry policies.
National Forest and Wildlife Service (SERFOR)	Luis Gonzalez Executive Director Email:	The national technical-regulatory authority for the forestry sector. Governs the National Forest and Wildlife Management System (SINAFOR). Responsible for issuing regulations and establishing procedures within its area of jurisdiction. Its advisory body is the National Forest and Wildlife Commission (CONAFOR). <i>Role:</i> Establishes and implements forestry policies, monitoring and control.
National Institute for Agricultural Innovation (INIA)	Miguel Angel Barandiarán Gamarrá Head Tel.: + (51 1) 240-2100 Annex 250	Responsible for research, innovation and adaptation of agricultural technology, aimed at increasing productivity and competitiveness, enhancing the value of genetic resources, and achieving sustainable agricultural and forest production.

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
	Email: jefatura@inia.gob.pe	<i>Role:</i> Agricultural and forestry research and technology development and adaptation.
Productive Rural Agriculture Development Program (AGRORURAL)	Ing. Jacqueline Rocio Quintana Flores Executive Director Av. República de Chile 350, Jesús María, Lima Tel.: (511) 205-8030 annex 4202 Email: jquintanaf@agrorural.gob.pe	National program specialized in fighting rural poverty via strategies, activities and mechanisms for increasing the income and improving the quality of life of rural families. <i>Role:</i> provides agricultural technical assistance and disseminates improved technologies.
Compensation Program for Agricultural Competitiveness (AGROIDEAS)	Jorge Augusto Amaya Castillo Executive Director Tel.: (+51) 2098800 annex 4010 Email: jamaya@minagri.gob.pe	National program operating at the national and regional levels through grants in support of the increased commercial competitiveness of organizations of small- and medium-sized agricultural, forestry, or livestock producers, via the formation and improved management of producer organizations and the adoption of improved technology. <i>Role:</i> Provides financial incentives for improved technology adoption by groups of agricultural, forestry, or livestock producers.
National Agricultural and Phytosanitary Service SENASA	Pedro Jesús Molina Executive Director Av. La Molina Nº 1915, La Molina Lima 12 Tel: (511) 313-3300. Email: senasacontigo@senasa.gob.pe	Specialized public institution and authority related to agricultural sanitary conditions, input quality, organic production, and food safety. Offers phytosanitary and zoonosanitary inspection, verification, and certification services, diagnoses, identification and provision of biological control agents, registration and supervision of agrochemicals, seeds, and nurseries. Also trains professional, technicians, producers, authorities, and the general population in these areas. Source of technical information and TA, ensures compliance with the phytosanitary requirements of specialized markets.
Mountain and Jungle Exports (Sierra y Selva Exportadora)	José Gerardo Néstor Ezeta Carpio Executive Director Av. República de Panamá N° 3591 Piso 13 - San Isidro – Perú Tel.: 0051215 0730, 0051215 0745 Email: sierrainforma@sierraexportadora.gob.pe	Promotes market access of small and medium organized producers from the Peruvian Andes and Amazon <i>Role:</i> Promotes participation in de-commoditized markets, foment associativity, and achieve market access.
General Directorate of Environmentally-related Agrarian Affairs – DGAAA	Roxana Isabel Orrego Moya General Director Tel.: 240-0233, Annex 4100 Email: rorrego@minagri.gob.pe	Approves Environmental Impact Studies for the agricultural sector and performs environmental audits of agricultural, agro-industrial, and renewable natural resources projects and activities. Also approves the classification of lands by greatest use. <i>Role:</i> Audits agricultural and forestry activities of emissions reduction programs and the private sector.
Vice-Minister for Intercultural Affairs	Elena Antonia Burga Cabrera Vice Minister Cultural Affairs Av. Javier Prado Este 2465 San Borja, Lima 41 Tel.: 511-618-9393 Email:	Governing body in charge of designing and formulating public policy on intercultural and indigenous matters; serves as the principal public authority on matters of prior consultation of indigenous groups. <i>Role:</i> Liaison and consultation with indigenous communities.
Ministry of Economy and Finance, Vice-Ministry of Economy	Michel Rodolfo Canta Terreros Vice-Minister Tel.: 428-1880 Email: veconomia@mef.gob.pe	Governing body responsible for designing and implementing national economic and financial policy, with a view toward achieving economic well-being.

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
		<i>Role:</i> Approves ministerial and regional government budgets, establishes economic policies, and approves government incentives.
Office of Forest and Wildlife Resources Supervision (OSINFOR)	Econ. Máximo Salazar Rojas Head Av. Javier Prado Oeste 692 – Magdalena del Mar, Lima Tel.: 615-7373 annex 1202 Email: msalazar@osinfor.gob.pe	Institution responsible for the supervision and oversight of the sustainable use and conservation of forest and wildlife resources, as well as for forest-generated environmental services. <i>Role:</i> Forest resources monitoring and control
Ministry of the Environment (MINAM)	Lucía Ruiz Ostoic Minister Av. Antonio Miro Quesada (ex-Juan de Aliaga) 425 - 11º Piso - Magdalena del Mar, Lima Tel.: (01)6116000 Annex 1004 Email: lruiz@minam.gob.pe	Governing institution of the environmental sector. Promotes conservation and sustainable use of natural resources, biological diversity, and protected natural areas. The national environmental authority and Focal Point for international negotiations on Climate Change. The MINAM is also responsible for technical aspects related to REDD+ and for coordinating with pertinent public and private, national, and sub-national (regional) institutions. Focal point for the ERPD. <i>Role:</i> institution responsible for planning, coordination, and implementation of the emissions reduction program.
General Bureau of Climate Change, Desertification (DGCCD)	Rosa Morales Saravia General Director Tel.: +51 1 611 6000 Annex 1350 Email: rmorales@minam.gob.pe	Responsible for formulating national policy and regulations on climate change management in coordination with relevant entities. The designated national authority for compliance with the commitments assumed under the United Nations Framework Convention on Climate Change. <i>Role:</i> Focal Point for REDD+ in Peru. Emits BUR annual reports.
General Bureau of Environmental Economics and Financing (DGEFA)	Luis Guillermo Marino Nava General Director Tel.: 01-611- 6000 Annex 1350 Email: lmarino@minam.gob.pe	Formulates and promotes national policy, plans and instruments for the assessment and enhancement of the value of natural resources, biological diversity and environmental services. <i>Role:</i> monitors non-carbon benefits related to payments for ecosystems services (MRSE in Spanish); participates in benefit distribution plans.
National Forest Conservation and Climate Change Mitigation Program (PNCBMCC)	Rudy Alberto Valdivia Pacheco Program Coordinator Email: rvaldivia@bosques.gob.pe	Subordinate to the MINAM Vice-Ministry of Strategic Natural Resource Development, the PNCBMCC's goal is the conservation of 54 million hectares of tropical forest, as a contribution to climate change mitigation and sustainable development. Responsible for the REDD+ Action Plan and co-responsible with SERFOR for the National Forests and Climate Change Strategy. <i>Role:</i> Lead institution of ENBCC/REDD+ strategy, participates in MRV and national forest cover monitoring system, responsible for early warning system and annual deforestation estimates
National Natural Protected Areas Service (SERANAP)	Pedro Gamboa Moquillaza Head Calle Diecisiete Nº 355 - Urb. El Palomar - San Isidro, Lima Tel.: Email: pgamboa@sernanp.gob.pe	Public agency under the Ministry of the Environment, whose primary function is to manage and operate the National System of Natural Protected Areas (SINANPE). Promotes, grants, and regulates rights to environmental services within the sphere of natural protected areas at the national level. <i>Role:</i> participate in implementation of interventions involving protected areas.
Fund for the Promotion of Protected Natural Areas of Peru (PROFONANPE)	Executive Director- pending Tel.: (51 1) 218 1097 / (51 1) 315 5700 E-mail: comunicaciones@profonanpe.org.pe	Non-profit private institution specialized in the raising and administration of funds in support of Peru's Protected Natural Areas (ANPs), biodiversity conservation, and the mitigation and adaptation to climate change. Provides financial resources to SINANPE and ANPs, buffer zones, conservation corridors, etc.

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
		<i>Role:</i> Fund-raising and/or administration of ANPs and their buffer zones.
Peruvian Amazon Research Institute (IIAP)	Dr. Luis Ezequiel Campos Baca President Tel.: +51 (065) 265522 / +51 (065) 265516 annex 104 Email: presidencia@iiap.gob.pe /lcampos@iiap.gob.pe	Institution for scientific research and technology for development, specializing in the sustainable use of biodiversity in the Amazon region. Promotes methodologies for the sustainable use of natural resources. <i>Role:</i> research and technology adaptation for the Amazon.
OSINFOR	Máximo Salazar Rojas Director Av. Javier Prado Oeste 692 – Magdalena del Mar, Lima Tel.: 615-7373 annex 1202 Email: msalazar@osinfor.gob.pe	Institution responsible for the supervision and fiscalization of General Forest Management and Annual Operating Plans. <i>Role:</i> Inspection of forestry plans and control of timber legality
CITE Forestal	Marina Perez Rosas Director Pucallpa (Ucayali) Calle Flora y Fauna 199, km 4.2, Pucallpa, Ucayali Tel.: (511) 061-579085 Email: citeforest_pucallpa@itp.gob.pe	Technical institution of the Ministry of Production (PRODUCE) specialized in wood production and processing. Its objective is to promote innovation and improve the transformation and industrialization of wood products. Offers services related to the development of products, technology transfer, laboratory analyses, technical assistance, training and certification related to sustainable forestry management best practices. <i>Role:</i> Promotes business of development of wood transformation
COFIDE	General Manager Alex Zimmermann Novoa azimmermann@cofide.com.pe Augusto Tamayo 160, San Isidro - Lima, Peru	Provides funding and technical assistance for microenterprises <i>Role:</i> Management, credit & technical assistance
Regional Government Authorities		
San Martin and Ucayali Regional Governments, especially their Economic Development Programs and the Regional Environmental Authorities (see below)	<p>San Martin Regional Government Pedro Bogarín Vargas Governor General Manager Quinto del Aguila Chavez Calle Aeropuerto Nro. 150 Barrio Lluylucucha – Moyobamba-Dpto. de San Martin - Peru</p> <p>Ucayali Regional Government Francisco Antonio Pezo Torres Governor Edgar Juan Diaz Zuñiga General Manger Jr. Raymondi Nro 220 Tel: +051 61 58 6120</p>	<p>Regional governments are responsible for:</p> <ul style="list-style-type: none"> ● Physical and legal titling of rural property, including farms and indigenous lands and land belonging to the state. ● Preparation of the land registry. ● Administration of government-owned lands within its jurisdiction. ● Land Use Planning (Economic and Ecological Zoning). ● Regulation of forestry activities within its jurisdiction by granting forest licenses, authorizations, and concessions and carrying out control. ● Processing and evaluation of private investments in regional irrigation projects, in order to advance the agricultural frontier (DL 994). ● Monitoring and control to guarantee sustainable use of natural resources under its jurisdiction <p><i>Role:</i> Intervention implementation, establishment of regional natural resource policies, monitoring and control of natural resource use, contribute to productive infrastructure, technical assistance, provide credit guarantees (FONDESAM).</p>

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
Forest and Wildlife Management Units (UGFFS)	<p>San Martin Regional Government pending designation Prolongación 20 de abril s/n Moyobamba-Dpto. De San Martin-Perú</p> <p>Ucayali Regional Government Dr. Marcial Pezo Armas Jr. Raymondi Nro 220 Calleria - Coronel Portillo - Peru Tel: +051 061 58 6120</p>	<p>Regional organization responsible for the management, administration, and public control of forest and wildlife resources. Operates under the aegis of each regional government. The UGFFS can establish community forest management units that include stakeholder participation in their administration. Active in the public administration of forestry permits.</p> <p><i>Role:</i> Public administration of forestry management.</p>
Regional Agriculture Directorate (DRA)	<p>San Martin Regional Government Ing. Jose Revilla Jr. Angel Delgado Morey Nro. 435 Tarapoto.</p> <p>Ucayali Regional Government Macks Pinchi Jr. Raymondi Nro 220 Tel: +051 61 58 6120</p>	<p>Decentralized body subordinate to the Office of the President of the regional governments. Promotes agricultural production and is the principal regional coordinating body of the Ministry of Agriculture. The regional governments' agricultural bureaus are also responsible for implementation of land titling and the formalization of rural agricultural property.</p> <p><i>Role:</i> Will participate in land titling and the cession of use contracts, agricultural monitoring, and technical assistance.</p>
Regional Environmental Authorities (ARA)	<p>San Martin ARA Gerardo Cáceres Bardález Prolongación 20 de abril s/n Moyobamba-Dpto. De San Martin-Perú</p> <hr/> <p>Ucayali ARAU Ing. Noe Klever Guadalupe Jr. Raymondi Nro 220 Tel: +051 61 58 6120</p>	<p>Regional government entities responsible for environmental affairs, protected areas, and land use planning. These bodies are governed by the Environmental Management Law and other provisions that regulate the Regional Environmental System.</p> <p><i>Role:</i> principal partner within the regional governments for implementation of the emissions reduction program; monitoring of land use and emissions at regional level.</p>
Regional Economic Development Programs	<p>GORE San Martin DE Daniel Vasquez Cenepo Moyobamba-Dpto. De San Martin – Perú</p> <p>GORE Ucayali DE Ing. Vicente Nuñez Ramirez Jr. Apurimac N° 460 4to Piso Pucallpa Tel: +051 61 58 6120</p>	<p>Area of the regional government responsible for inter-sectorial and multi-level coordination related to economic development based on regional branding.</p> <p><i>Role:</i> Promote low emissions development, implement and monitor regional branding, oversee the use of FONDESAM funds, promote private sector investment.</p>
Amazonian Interregional Council (CIAM)	<p>Authorities are pending based on up-coming elections.</p>	
Sustainable, Competitive, and Inclusive Forest Development Program of the Peruvian Amazon (PRODFEFAP)	<p>Favio Alfredo Rios Bermúdez Executive Director Manco Capac 551, Miraflores, Lima. Tel.: +51 2259005 Email: frios@serfor-caf.gob.pe</p>	<p>Project aimed at the recuperation, conservation and use of Amazon forests via the strengthening of public forestry institutions, forest management, and increases in competitiveness of the forestry sector.</p> <p><i>Role:</i> Potential source of competitive funds for watershed protections, recovery of degraded ecosystems, sustainable use of non-timber forestry products and wildlife, ecotourism promotion, and forestry research.</p>
National Commission for Life and Development Without Drugs – DEVIDA	<p>Ismael Rubén Vargas Céspedes Executive Director Alfredo Benavides 2199, Miraflores, Lima Tel.: (01) 207-4800 Email: fvargas@devida.gob.pe</p>	<p>Provides public funding and technical assistance for coffee, palm oil and cocoa production as substitutes for coca.</p> <p><i>Role:</i> Agricultural technical assistance</p>

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
Amazon Development Fund, San Martin - FONDESAM.	Authorities are pending based on up-coming elections. General Manager, Regional Government of San Martin	Finances development projects in San Martin and acts as guarantee of initiatives that contribute to low emissions development. <i>Role:</i> Provide credit guarantees for loans to small farmers participating in the Program.
Amazon Development Fund, Ucayali - FONDESAM.	Responsible of the Guarantee Fund, Ucayali Miguel Sanchez Toledo Tel.: 950 609 694 Email: msanchezt15@hotmail.com	Guarantee fund for agriculture and aquaculture initiatives. <i>Role:</i> Provide credit guarantees for loans to small farmers participating in the Program.
Forest Investment Program (FIP)	Housed within the PNBCMCC, but not yet in execution	Multi-territorial forestry development project with activities in Atalaya, Ucayali and Caynarachi and Barranquita, San Martin. <i>Role:</i> Strengthening of forest governance, classification, and zoning, technical assistance.
Proyecto Especial Alto Mayo	General Manager Muller Alvear Huancas Huaman Calle La Marginal 233. Sector Uchuglla. Moyobamba (042) 562522	Provides public funding and technical assistance for coffee, and cocoa production <i>Role:</i> Agricultural technical assistance
Proyecto Especial Huallaga Central y Bajo Mayo	General Manager Antonio Perez Juzcano Av. Circunvalación s/n. Tarapoto (042)523240	Provides public funding and technical assistance for coffee, and cocoa production <i>Role:</i> Agricultural technical assistance
Institutions /NGOs/ Projects		
“Sustainable Productive Landscapes in the Peruvian Amazon” Program	Diana Rivera Project Coordinator Email: drivera@pnud.org.pe	Program led by MINAM, with the participation of MINAGRI, SERFOR, the Huánuco and Ucayali regional governments, indigenous organizations, and civil society. The Program is implemented by UNDP and financed by GEF. Its objective is to conserve biodiversity and ecosystems, recover degraded areas and mitigate climate change. <i>Role:</i> Implement interventions that reduce deforestation.
Conservation International	Luis Espinel Bosque de Protección del Alto Mayo Carretera a Posic-Oficina Agencia Agraria Rioja (042) 558467	International NGO involved in the implementation of a coffee development program in the Alto Mayo sector of San Martin. <i>Role:</i> Technical assistance and dissemination of technologies.
Peru Cacao Alliance	Jose Iturrios Director Camino del Inca 670, 2nd floor, Surco, Lima Tel.: 954 063 366 Email: jiturrios@perucacao.org	Consortium of national and international businesses and NGOs for the promotion and development of cacao in San Martin and Ucayali. <i>Role:</i> Technical assistance and technology dissemination.
CIMA Center for Conservation, Research, and Management of Protected Natural Areas (CIMA)	Patricia Fernández Dávila Director Jr. Angel Delgado Morey 565 Partido Alto, Tarapoto, San Martin	Administrator of the Cordillera Azul natural protected area. <i>Role:</i> Technical assistance, technology transfer, and local monitoring of buffer zones of the Cordillera Azul ANP.
Alternate Mechanisms for Development (MDA)/ GCF Task Force in Peru	Victor Galarreta Encinas Coordinator Miguel Dasso 134 Of- 402, San Isidro, Lima Tel.: +51 999667524 Email: vgalarreta@mda-org.pe	The GCF Task Force aims at promoting emission reductions due to deforestation and forest degradation in the Amazon region of Peru. <i>Role:</i> facilitates coordination among the regions and the national government and inter-regional learning aimed at achieving low emissions development.

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
PNUD/GCF Task Force Ventanilla A Regional Strategies for carbon Low Emission	Earth Innovation Institute (EII) Gustavo Suarez de Freitas Coordinator Miguel Dasso 134, of. 402, San Isidro, Lima Tel.: 996 136 927 Email: gsuarezdefreitas@earthinnovation.org	Project for the promotion of the reduction of deforestation and low emissions rural development based on the PPI approach, Ucayali and San Martin. Project based on the PPI approach implemented with the Ucayali and San Martin regional governments, in collaboration with the Association for Integrated Development (AIDER), Nature and Culture International (NCI), the Peruvian Society for Eco-development (SPDE) Ausejo Consulting & CGIAR international center for agroforestry research. Active in economic tree species, cacao, and land use research, mainly in Ucayali. <i>Role:</i> Data generation and analysis. Technical assistance for cession of use contracts for agroforestry. Special studies. <i>Role:</i> coordination of multi-stakeholder platforms, regional government strengthening
USAID- PRO-BOSQUES: Promoting sustainable inclusive and profitable forestry	Dr. Héctor Cisneros Velarde Jefe de Proyecto Hector.Cisneros@probosquesperu.org Tel.: +51 998560205	New USAID project to support private and public sector 6 communities in Ucayali to strength forestry governance focusing in the application of the Control Module of the National Forestry Information System (MC-SNIFFS).
Indigenous organizations		
Coordinator of the Defense and Development of the Indigenous Population of San Martin (CODEPISAM)	Jaime Tapullima Pashanasi Dirección: Jr. Ulises Reátegui N° 417. Tarapoto, región San Martin Tel.: 979940577 Email: codepisam_2006@hotmail.com	Regional indigenous organization of San Martin whose objective is to promote the integrated development of indigenous peoples of the region and defend their territorial, human, and fundamental rights. Represents 79 indigenous communities and 5 federations. <i>Role:</i> Representative of indigenous organizations in San Martin. Will be involved in community forestry management, local forest monitoring, community strengthening, and training.
Regional Organization of AIDSEP, UCAYALI (ORAU)	Reyder Sebastián Quinticuari, President Jr. Aguarico N° 170 – Pucallpa Tel.: (061) 57-3469	Organization whose objective is to represent and promote the economic, social, political, and cultural development of its indigenous members. Represents 13 federations and 15 indigenous peoples. <i>Role:</i> Representative of indigenous organizations in Ucayali. Will be involved in community forestry management, local forest monitoring, community strengthening, and training.
Regional Union of Amazonian Indigenous Peoples in the Province of Atalaya, Ucayali (URPIA).	Cleofas Quintori Soto President	Organization with members of the asháninka, yami, shipibo conibo, amahuaca, yaminahua, kashinahua, shintonahua and machiguenga indigenous peoples in the province of Atalaya. <i>Role:</i> Will play an important role in community forest management, forest monitoring, and the strengthening of indigenous communities.
Regional Coordinator of the Indigenous Peoples of Atalaya (CORPIAA)	Edwin José Jumanga Ruiz Dirección: Jr. Tnte. Mejía N° 582 – Atalaya, Ucayali Tel.: 948820765 Email: edwin_jum@hotmail.com jumangaruiz@gmail.com	AIDSEP base organization in the province of Atalaya which groups the Yine and Ashaninka indigenous peoples. Operates principally along the Ucayali river and its main tributaries. <i>Role:</i> Active in community forest management and strengthening the capacity of indigenous actors.
Private sector		
Cacao Agricultural Cooperative (ACOPAGRO)	Gonzalo Rios Nuñez Dirección: Jr. Arica 284 Juanjuí-San Martín Tel.: #948820765 Tel.: 042-545190	Organization of small producers of fine cacao varieties, located in the Central Huallaga Valley, San Martin. Distributed in 4 provinces: Mariscal Cáceres, Huallaga, Bellavista, and Picota, with more than 2000 members. Promotes the production, harvest, and export of organic cacao beans.

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
	Email: acopagro@qnet.com.pe	<i>Role:</i> Promotes new plantings in deforested areas and training and technical assistance. Partners in the development of deforestation free value chains and in promoting the San Martin branding.
Coffee Agricultural Cooperativa "Oro Verde Ltda."	Hildebrando Cárdenas Salazar Dirección: Jr. San Martín 514- Lamas- San Martín Tel.: 042-543389 Email: oroverde@oroverde.com.pe	Small farmer coffee cooperative working in 2 provinces of San Martin, with 1280 members and 1296 ha of coffee. <i>Role:</i> Promotes new plantings in deforested areas and training and technical assistance. Partners in the development of deforestation free value chains and in promoting the San Martin branding.
Peruvian Amazon Association of Agricultural Cooperatives "Verde Amazónico" (AVA)	Nilda Estela Guevara Jr. Molinera 490- La Banda de Shilcayo- Tarapoto San Martín Tel.: 945594380 Email: nestela@verdeamazonico.org	Small cocoa producer association made up of 17 organizations (2 associations and 15 cooperatives) with 6,079 members. <i>Role:</i> Promotes new plantings in deforested areas and training and technical assistance.
Fine Cocoa Agricultural Cooperative Federation of Tocache, Ltda.	Higor Jaramillo Falcón Jr. Clemente Fasabi 8- Tocache San Martín Tel.: 042-551536 Email: gerencia@cacaodearoma.com	Cooperative federation that groups 6 producer organizations and 981 members active in the Alto Mayo region of San Martin. <i>Role:</i> Promotes new plantings in deforested areas and training and technical assistance.
CAFENOR PERU SAC	Vicente Minga Dirección: Carretera Fernando Belaunde Terry – Moyobamba – San Martín Tel.: 942499978 Email: kfenorperu@hotmail.com	Service company active in the coffee value chain. Has a processing plant, laboratories, and bills more than \$12 million annually. <i>Role:</i> Implementation of new stockpiling models based on centralized processing plants and oriented toward the demand of low emissions markets. Partners in the development of deforestation free value chains and in promoting the San Martin branding.
Alto Mayo Cooperative	Omar García Mendoza Tel.: 939077347	Small producer coffee cooperative with more than 1000 members in San Martin. Export value of coffee produced is more than \$12 million annually. <i>Role:</i> Promotes new plantings in deforested areas and training and technical assistance. Partners in the development of deforestation free value chains and in promoting the San Martin branding.
Doncel Coffee Producer Association	Segundo Ortiz Chavez Jr. José Olaya 1452 Soritor- San Martín Tel.: 975168506 Email: Doncel_coffee@yahoo.es	Small coffee producer organization with 900 members and 2,450 ha. <i>Role:</i> Promotes new plantings in deforested areas and training and technical assistance.
Alto Mayo Valley Cooperative CACVAM	José Noel Perez Oblitas Francisco Bolognesi 03 – Nva Cajamarca – San Martín Tel.: 942047476	Coffee cooperative with 645 members and 2,460 ha. <i>Role:</i> Promotes new plantings in deforested areas and training and technical assistance.
Asociación de Productores Forestales de Ucayali (APROFU)	Noruzca Culqui Jr. Independencia 128, Pucallpa Tel.: (061) 57 36 28 Email: gerencia@aprofupero.org	Association of 38 wood-related businesses in Ucayali. Members include loggers, sawmills, carpentry shops, and plywood manufacturers.
Cámara de Segunda Transformación de la Madera	Presidente: Gary Alan Céspedes. Calle Cahuide, Mza. 174 Lote 12 (Espaldas del Grifo Selvagas)	Recently formed association of 15 businesses dedicated to the re-sawing of wood in Ucayali.

Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
	Yarinacochoa, Coronel Portillo, Ucayali	
Cámara Nacional Forestal	President: Pío Santiago Puertas. Jiron Ramón Dagnino 369, Jesús María, Lima	Non-profit civil society organization that represents the private forestry sector in Peru. Dedicated to promoting sustainable production and use of forestry resources, and national forestry policies in line with private interests of its members.
Aromatic Cocoa Cooperative "Colpa de Loros"	President: Irene Chamaya Carretera Federico Basadre Km. 66, Neshuya, Ucayali Tel.: 942 433 640	Groups 250 small cocoa producers from the Irazola district of Ucayali. The cooperative has a commercial partnership with the French company Koaka.
Association of Technified Cocoa Producers of Padre Abad (ACATPA)	Jiron Arica 124, San Alejandro, Padre Abad, Ucayali Tel.: (62) 962-760-048 Email: acatpa@gmail.com	Groups 145 cocoa producers in the Irazola district of Padre Abad. Provides technical assistance and training, some credit, and UTZ certification. Has 3 stockpiling centers and drying and fermentation module. Sells inputs and equipment to members.
Central Committee of (Oil Palm) Producers of Ucayali (COCEPU)	President: Jose Silvio Lopez Yarupaitan Jiron Los Frutales Nro. 249, Urban. Emancipación, Callería, Coronel Portillo, Ucayali Tel.: 578421 https://www.datosperu.org/empresa-comite-central-de-palmicultores-de-ucayali-20154598082.php	Groups 6 associations of palm oil producers, producing about 80,000 t/yr
Association of Oil Palm Producers of Shambillo-Aguaytia (ASPASH)	Carretera Federico Basadre km 178, Boqueron, Padre Abad Tel.: 943191952 Email: aspash0204@hotmail.com	Groups 13 producer associations that produce about 26,000 t/yr
Refinca	Gen. Manager: Javier Rivera Pinzas Av. El Derby 254, piso 24 Urb. El Derby de Monterrico, Santiago de Surco, Lima Tel.: 993 465 824 Email: jrivera@refinca.com	Private enterprise in the process of establishing a reforestation project in the Campoverde-Neshuya region of Ucayali.

2. STRATEGIC CONTEXT AND RATIONALE FOR THE ER PROGRAM

2.1 Current status of the Readiness Package and summary of additional achievements of readiness activities in the country

Peru's involvement with the Forest Carbon Partnership Facility (FCPF) began in 2008, when the Peruvian government requested to be included in the FCPF process. The country submitted a REDD+ Readiness Plan Idea Note (R-PIN) in 2008¹, which was approved the same year. The preparation of the REDD+ Readiness Preparation Proposal (R-PP) between 2009 and 2013 was jointly assumed by the MINAM, MINAGRI, MEF, regional governments, the Vice-Ministry of Intercultural Affairs under the Ministry of Culture, AIDSEP and CONAP indigenous organizations, and involved wide stakeholder participation. Approval of the R-PP², which included \$3.8 million in funding, was delayed until May, 2014³. Under this agreement, Readiness activities are financed by the FCPF, but the funds are administered by the Inter-American Development Bank (IDB) as the Delivery Partner in Peru. This arrangement includes an agreement between the World Bank and IDB for a common approach to environmental and social safeguards.

A mid-term evaluation of the Readiness Program was conducted at the end of 2016 and was presented in January, 2017⁴. Findings suggested that further work was needed on the grievance resolution and benefit sharing mechanisms, public disclosure, the effect of REDD+ strategy options on sector policies, the analysis of social and environmental impacts (SESA), the framework for their management (ESMF), and the incorporation of these considerations in the design of the REDD+ strategy, the identification of non-carbon aspects of the strategy, monitoring, reporting, information sharing and dissemination of key outcomes, and institutional arrangements and capacities. As a result, \$5 million in additional funding to support these activities was approved in August, 2018⁵.

Another self-evaluation of the R-PP was carried out in January, 2019. The results of this evaluation indicate that the components related to the Reference Level (indicators 26-28) and the Forests and Safeguard Monitoring System (indicators 29 – 34) are complete or well advanced, but that results for the Organization and Consultation (indicators 1-10) and the REDD+ Strategy (indicators 11-25) components are partial. Shortcomings are mainly associated with the impact of the REDD+ Strategy on policies and the legal framework, the development of the Environmental and Social Monitoring Framework, the feedback and grievance redress mechanism, the benefit distribution plan, the national REDD+ registry, and the disclosure of consultation outcomes. Endorsement of the R-Package was received in March 2019 (Resolution PC/27/2019/3). The Participants Committee encourages Peru to take the following issues into account as they move forward:

- "Improve multi-stakeholder consultations at the national and sub-national level, including other sectors (e.g. infrastructure sectors) and the private sector.

¹ https://www.forestcarbonpartnership.org/sites/fcp/files/Peru_R-PIN_07-31-08.pdf

² <https://www.forestcarbonpartnership.org/sites/fcp/files/2014/February/R-PP%20Per%C3%BA%20Final%20Dec%202013-RESALTADO.pdf>

³ <https://www.forestcarbonpartnership.org/sites/fcp/files/2014/June/Acuerdo%20de%20Cooperaci%C3%B3n%20T%C3%A9cnica%20ATN-FP-14403-PE.PDF>

⁴ <https://www.forestcarbonpartnership.org/sites/fcp/files/2017/Jan/MidTerm%20Readiness%20evaluation%20English%20vers%20final%2028Enero%202017%29%20final.pdf>

⁵ <https://www.forestcarbonpartnership.org/sites/fcp/files/Additional%20funding%20grant%20agreement%20signed%208-8-2018.pdf>

- Continue the development of an accounting framework, including nesting, and the National GHG Mitigation Actions registry to integrate existing REDD+ initiatives as well as address and prevent double counting.
- Continue the development of the indigenous approach as part of the forest cover monitoring module (MMCB).
- Finalize a robust mechanism for implementation and reporting on environmental and social safeguards, as well as operationalizing a grievance and redress mechanism - FGRM (MAC REDD+) aligned with existing national mechanisms, and continue to make progress in improving land tenure security.”

Figure 2.1.1 Results of the evaluation of the RPP in January, 2019

Indicator	R-Package Self-assessment 2017-2018
1. Accountability and transparency	Acceptable
2. Operating mandate and budget	Partial
3. Multi-sector coordination mechanisms and cross-sector collaboration	Partial
4. Technical supervision capacity	Partial
5. Funds management capacity	Further development required
6. Feedback and grievance redress mechanism	Further development required
7. Participation and engagement of key stakeholders	Partial
8. Consultation processes	Partial
9. Information sharing and accessibility of information	Partial
10. Implementation and public disclosure of consultation outcomes	Further development required
11. Assessment and analysis	Acceptable
12. Prioritization of direct and indirect drivers/barriers to forest carbon stock enhancement	Acceptable
13. Links between drivers/barriers and REDD+ activities	Partial
14. Action plans to address natural resource rights, land tenure, governance	Partial
15. Implications for forest law and policy	Partial
16. Selection and prioritization of REDD+ strategy options	Partial
17. Feasibility assessment	Partial
18. Implications of strategy options on existing sectorial policies	Further development required
19. Adoption and implementation of legislation/regulations	Further development required
20. Guidelines for implementation	Little or no progress
21. Benefit sharing mechanism	Little or no progress
22. National REDD+ registry and system monitoring REDD+ activities	Little or no progress
23. Analysis of social and environmental safeguard issues	Partial
24. REDD+ strategy design with respect to impacts	Partial
25. Environmental and Social Management Framework	Further development required
26. Demonstration of methodology	Acceptable
27. Use of historical data, and adjusted for national circumstances	Acceptable
28. Technical feasibility of the methodological approach, and consistency with UNFCCC/IPCC guidance and guidelines	Acceptable
29. Documentation of monitoring approach	Partial
30. Demonstration of early system implementation	Acceptable
31. Institutional arrangements and capacities	Acceptable
32. Identification of relevant non-carbon aspects, and social and environmental issues	Partial
33. Monitoring, reporting and information sharing	Partial
34. Institutional arrangements and capacities	Acceptable

Other achievements related to REDD+ Readiness include the preparation and approval, in October 2014⁶, of Peru's Emissions Reduction Project Idea Note (ER-PIN)⁷ to the FCPF Carbon Fund. Based on the approval of the ER-PIN, the Letter of Intent enabling the next step - the preparation of the Carbon Fund Emissions Reduction Document (ERPD) - was signed in March, 2016⁸ and was extended in August, 2018⁹. This present document contains Peru's formal proposal (ERPD) to the Carbon Fund.

Besides activities with the Forest Carbon Partnership Facility, in 2010, Peru was also selected as a pilot country by the Forestry Investment Program (FIP) of the Climate Investment Fund. Peru's FIP Idea Note was approved in October, 2013 and \$5.5 million for a Global Dedicated Grant Mechanism for Indigenous Peoples and Local Communities (the DGM - Saweto project) and \$36 million in funding were approved in December, 2017¹⁰. The Saweto Project (DGM-Saweto) is an initiative designed by indigenous Amazonian national organizations: the Interethnic Association for the Development of the Peruvian Rainforest (AIDSEEP) and the Confederation of Amazonian Nations of Peru (CONAP) and is implemented by indigenous groups in the Amazon with administrative support from the World Wildlife Fund (WWF).

Historical trends in the Peruvian Amazon demonstrate that when indigenous communities have secure land tenure, deforestation and degradation rates are minimalized. As a result, the DGM is supporting land recognition and titling for hundreds of Indigenous communities, in addition to community-based sustainable forest management contributing to climate targets for while contributing to climate-smart rural development.

The DGM-Saweto experience has been largely positive and has shown how partnerships among indigenous groups, competent and independent financial administrators (WWF), and regional governments can achieve the recognition and titling of indigenous lands in a cost-effective manner. In the case of Ucayali, this experience has also stimulated the formalization of the Program for the Development of Indigenous Peoples within the regional government, whose manager is chosen in coordination with regional indigenous organizations, and whose purpose is to improve the relations between the regional government and indigenous peoples, particularly in regards to sensitive themes such as land titling and community forest management. These experiences and lessons learned are being scaled-up to other regional governments in the Peruvian Amazon via the Governors' Climate and Forest Task Force working group on Indigenous Peoples and Local Communities, which is also systematizing experiences of DGM Saweto with MFC for timber and non-timber forest products.

Recent Progress on REDD+

Since the R-PP mid-term evaluation in January 2017, Peru has made the following progress in the following areas of REDD+: accountability and transparency, analysis of environmental and social safeguard issues including continuing work on the national SESA and ESMF, improving the REDD+ strategy in order to lessen impacts, incipient design of a grievance and conflict resolution mechanism, participation and consultation with stakeholders, extension of the reference level to coastal forests, identification of co-benefits, early progress on the benefit distribution plan, initial steps to establish a

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<https://www.forestcarbonpartnership.org/sites/fcp/files/2014/september/Carta%20Viceministro%20MINAM%20al%20FCPF.pdf>

⁷ https://www.forestcarbonpartnership.org/sites/fcp/files/2014/september/PERU_ER-PIN_Sept.%2012.2014.pdf

⁸ <http://documents.worldbank.org/curated/en/318061468327583658/pdf/RAD767794819.pdf>

⁹ <https://www.forestcarbonpartnership.org/sites/fcp/files/FCPF%20Revised%20Letter%20of%20Intent%20Peru%202018.pdf>

¹⁰ <https://www.climateinvestmentfunds.org/projects/forest-investment-program-peru>

national registry of emission reductions including those of REDD+, demonstration of early system implementation, and institutional arrangements and capacities¹¹.

Overall Coordination

Overall responsibility for REDD+ within MINAM was transferred from the National Forest Conservation Program to the General Directorate for Climate Change and Desertification (DGCCD). Currently, a staff of 15 technicians are involved in coordination of REDD+ and associated projects. However, there is some dependence on international cooperation resources for the funding of MINAM's technical team in charge of REDD+ issues, a situation that may create a sustainability risk in the medium term.

A national mechanism for multi-sectorial, actor, and government coordination and governance of forests and climate change (Multisector and Intergovernmental Commission for the Establishment of Priority Public Actions for the Promotion of the Sustainable Development of the Territories of the Amazon - MIC, see section 2.3 below), within the framework of the National Forest and Climate Change Strategy (ENBCC), has been also been designed by MINAM and is being consulted with stakeholders (see Section 2.3). The overall objective is to reduce emissions from deforestation and forest degradation, while promoting sustainable development and improvements in the quality of life of Peru's inhabitants. This mechanism is complemented by a similar process being carried out by the office of the Presidency of the Council of Ministers (PCM) focused on improving coordination among levels of governments and sector related to sustainable development of the Peruvian Amazon.

Design and Implementation of the National Forest Monitoring System

The National Forest Monitoring Cover System (SNMCF or MNCB) is coordinated by the National Program for Forest Conservation and Climate Change Mitigation (PNCBMCC or PNCB) and SERFOR/MINAGRI, based on the new Forestry and Wildlife Law and its regulations, MINAM Ministry Resolution 324-2015, Legislative Decrees 1220 and 1319, and Executive Resolution 104-2017 of SERFOR.

The System consists of the following modules: 1) monitoring of deforestation, 2) monitoring of forest degradation, 3) monitoring of land use and changes in land use, 4) a deforestation early warning system, and 5) the monitoring of reference scenarios for emissions from deforestation and forest degradation. The National Monitoring System is being implemented in a stepwise fashion and is providing key information for the development of policies as well as emissions reports to the UNFCCC.

At present, the System has analyzed deforestation in the Amazon biome and is broadening the analysis of deforestation to pilot areas of dry coastal forests in the Lambayeque region. MINAM has also reached agreement with indigenous organization regarding a road map for incorporating indigenous concerns in forest monitoring, including the processes for participation, strengthening capacities, institutional coordination, and financial sustainability.

Reference Level

Peru's reference level for deforestation in the Amazon biome was submitted to the UNFCCC in 2015 and was approved in 2016. Proxy type studies have been carried out on forest degradation in the Amazon and current funding from UN-REDD+ will be used to establish a forest degradation reference level. In addition, Peru is developing a reference level for coastal dry forests.

¹¹ Peru REDD+ Readiness Package (R-PP), February 7, 2019. MINAM

Peru has various sub-national REDD+ projects, developed by NGOs and private companies in partnership with indigenous communities, forest concessions and protected areas, that began activities before MINAM established a FREL and MRV system for the Amazon biome. Since the baselines of these projects, as well as future projections of deforestation, differ from those of the FREL, a road map for aligning these projects with the FREL is needed in order to ensure the integrity of aggregate ER accounting in the Amazon. A roadmap for this process has been agreed upon with the projects and authorizes them to continue using their baselines until 2020 (when they will nest their baselines to FREL), while further negotiations are continuing to determine actions after that date.

National Forest and Climate Change/REDD+ Strategy

The Strategy is presently being strengthened and implemented via several of the projects mentioned above: the NDCs, DCI, FIP, PPS, SERFOR/CAF, and JICA, among others.

Safeguards

MINAM has developed a road map for the development of national REDD+ safeguards that respond to the ENBCC as well as the guidelines of the UNFCCC. This road map contemplates four processes: a) conceptualization and interpretation of the national safeguards (including the development and application of the SESA and the environmental and social management framework - ESMF) (in progress); b) the design and implementation of the SIS (including design, testing, evaluation, optimization, and formalization of the system) (in progress, with a December, 2020 estimated completion date); c) processes for the participation and capacity strengthening of stakeholders in the SIS design and testing processes (January, 2018 – October, 2020); and d) communication with the UNFCCC (November, 2017 – July, 2019).

Within this context, in 2017 a preliminary strategic social and environmental assessment (SESA), via 65 consultations, evaluated the impacts of the National Forest and Climate Change Strategy (ENBCC). These were incorporated into the prototype national Environmental and Social Management Framework (ESMF) and Safeguards Information System (SIS)¹², both of which are currently being further developed and socialized. The final design and initial implementation of the ESMF and SIS are foreseen in December, 2019. Similarly, the Plan for the Participation and Involvement of Stakeholders (PPIA)¹³ in REDD+ is being modified and updated with assistance from the FAO/UN-REDD+ Program. This process is based on actions and feedback between the national and project (e.g. FIP, ERPD) levels.

The plan for the distribution of benefits is being designed using inputs from previous proposals developed by MINAM since 2013, consideration of the benefit distribution plans of other participating countries in the Carbon Fund, as well as inputs from the ERPD and REDD+ processes, including consideration of the inclusion of participating actors, the form of benefits, criteria for benefit eligibility, distribution among actors and levels, incorporation of safeguards, and a road map for future progress.

Similarly, the design of a feedback and grievance and conflict resolution mechanism is based on discussions and prototypes developed since 2014, incorporates the PPIA and safeguards, and is being grounded in the concrete needs of the ER Program. This experience will subsequently be fed back into the design and implementation process at the national level in a process of continual adaptation and improvement.

¹² Desarrollo del Estudio EESA y Marco de Gestión Social y Ambiental y Propuesta de Sistema de Información de Salvaguardas. Arcadis, 2017.

¹³<http://www.minam.gob.pe/cambioclimatico/salvaguardas-redd/> Link to PPIA doc.

2.2 Ambition and strategic rationale for the ER Program

Country Context

Peru's Amazonian forests are important at global and national scales. On a global scale, Peru's extensive and megadiverse forests place the country in ninth place in terms of forest cover, fourth place in terms of tropical forests, and second among the Amazonian countries in forest area. At the national level, the Amazon represents 94% (about 68 million ha) of the country's forests.

Although Peru's forests are extensive, they contribute little to the national economy. The value of wood and wood products in 2017 (\$800 million, according to Luxbacher, 2017¹⁴) contributed to less than 0.5% to the GNP or the total value of exports, despite the fact that forests occupy about 55% of the national territory. Forest management is inadequate and scarce political attention has been paid to the forests, resulting in inadequate forestry budgets, deforestation and emissions, and the conversion of forests into focal points of poverty, illegality, and social conflict.

The undervaluation of this resource is resulting in accelerating deforestation and forest degradation, which are responsible for a large share of national greenhouse gas (GHG) emissions. Deforestation in the Amazon, estimated at 125,301 ha/yr for the period 2000-2017, but 147,198 ha/yr during 2008-2017, is responsible for almost all of national deforestation and 51% of the country's total GHG emissions¹⁵. Under the business-as-usual scenario used in the nationally determined contributions (NDCs) reported to the UNFCCC, national as well as Land Use, Land Use Change, and Forestry (LULUCF) sector emissions are estimated to increase by more than half between 2015 and 2030. At the same time, mitigation of 53,600,000 MtCO₂e/y of emissions from the LULUCF sector is expected to contribute to two-thirds of Peru's expected emission reduction goal of 30% in 2030¹⁶, almost all of which will have to come from the Amazon.

Within this context, the ER Program focusses on two large political jurisdictions in the Peruvian Amazon, where deforestation has historically been greatest: the regions of San Martín and Ucayali¹⁷ (Figure 2.2.1). Together, both regions have a territory of 161,663 km² (51,253 km² in San Martín and 110,410 km² in Ucayali), equivalent to about 21% of the total area (775,353 km²) of the Amazon, and contain about 12.7 million ha (3,365,916 ha in San Martín and 9,362,764 ha in Ucayali) of Amazonian forests (a total of 68.6 million ha in 2017). However, they are responsible for a disproportionately higher rate of deforestation (35% of deforestation in the Amazon between 2008 and 2017) than their area would suggest (Table 2.2.1). By the end of 2017, accumulated deforestation in the accounting area contributed to 30% (2.31 million ha) of deforestation in the Amazon (7.5 million ha). San Martín was the region with the greatest deforestation in the country, with 1.43 million ha of cumulative deforestation, while Ucayali was the third most deforested region, with 0.88 million ha of cumulative deforestation.

Figure 2.2.1. Maps of Peru, the Amazon, San Martín, and Ucayali

¹⁴ Luxbacher, K. 2017. Wood and Wood Product Trade in Peru Remains Strong. Global Agricultural Information Network GAIN Report. USDA Foreign Agriculture Service. Dec. 2017.

¹⁵ Peru's nationally determined contributions (NDCs) reported to the UNFCCC (2015).

¹⁶ MINAM (2015). <http://www.minam.gob.pe/wp-content/uploads/2015/06/contribucion-NDC21.pdf>

¹⁷ A region is a political jurisdiction equivalent to a state or department. Regions are divided into provinces and provinces into districts.

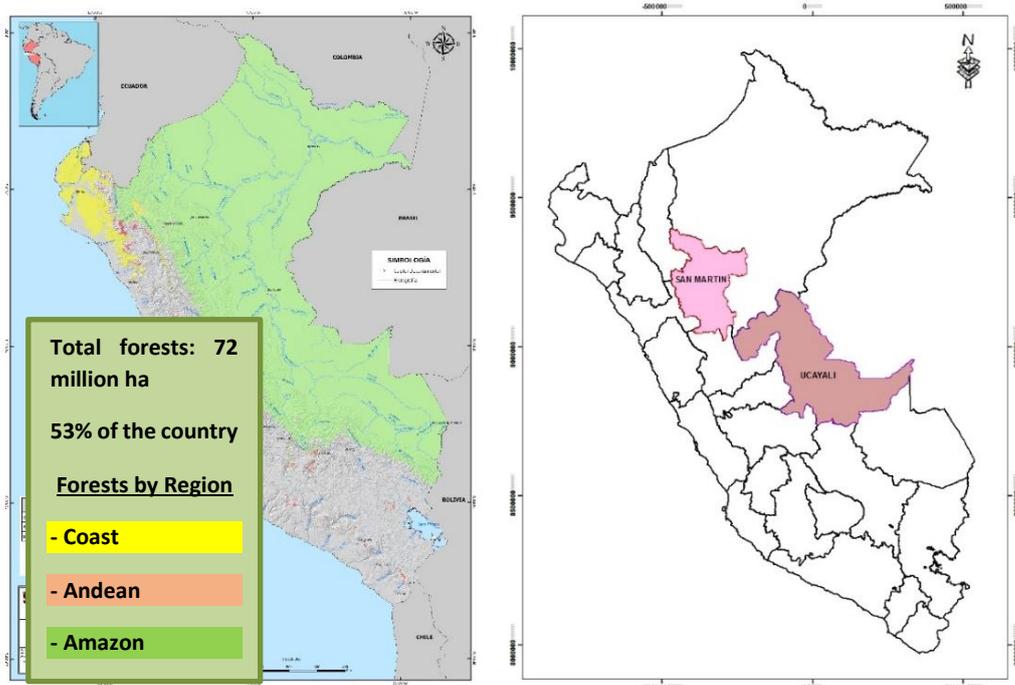


Table 2.2.1 Importance of the San Martín and Ucayali regions and their forests (PNCB-MINAM)

Region	Area (km ²)	Forest cover (ha)	Forest Loss (2000 – 2017) (million ha)	Forest Loss (2008-2017) (ha)
<i>San Martín</i>	51,253 (7%)	3,365,916 (5%)	1.43 (19%)	250,205 (17%)
<i>Ucayali</i>	110,410 (14%)	9,362,764 (14%)	0.88 (12%)	267,976 (18%)
Accounting area	161,663 (21%)	12,728,680 (19%)	2.31 (31%)	518,181 (35%)
Peruvian Amazon	775,353	68,577,351	7.5	1,471,976

Importance of the Emissions Reduction Program

The ER Program contributes and responds to Peru’s international commitments such as the Sustainable Development Goals, OECD recommendations, and the Paris Agreement (Table 2.2.2).

Table 2.2.2. ER Program alignment with Peru’s international commitments

Commitment	Specific areas of alignment of the ER Program
SDG	5. Gender equity 8. Decent work and economic growth 10. Inequity reduction 12. Responsible production and consumption 13. Climate action 15. Terrestrial ecosystem life
OECD	R1: Improve environmental inter-sectorial and inter-governmental coordination R6: Reduce informal economic activities that cause negative impacts on environment R18: Strengthen the environmental justice and police system R19 : Promote synergies between strategies R20: Guarantee the preservation of marine and terrestrial biodiversity R21: Strengthen the control of illegal trade of CITES species R46: Reinforce the intergovernmental coordination mechanisms and support the inclusion of impacts on biodiversity in the EIA (Environmental Impact Assessment), ESA (Environmental Strategic Assessment) and other tools R50: Value the economic potential of sustainable use of agriculture and biodiversity R51: Strengthen forest governance

R53: Readdress the financial and non-financial incentives, including PES, for agricultural production aligned with environmental goals
R55: Land titling process respectful of indigenous lands

At the national level, the ER Program will contribute to national development priorities. With regards to the latter, it is aligned with the three pillars of the Peru-World Bank Country Partnership Framework: (i) Productivity for growth; (ii) Services for citizens across the territory; and (iii) Natural resource and climate risk management¹⁸ as well as with the philosophy of green growth contained in Peru's proposal to join the OECD.

Environmentally, the ER Program's emphasis on reducing deforestation in the Amazon will make it a major contributor to Peru's NDC goals, since the LULUCF and agricultural sectors contribute the majority of Peru's GHG emissions. The ER Program is also consistent with and contributes to the implementation of the following national environmental policies, laws, and actions:

- the National Agreement, integrating environmental policy into planning for sustainable development;
- the Bicentennial Plan (targets 3 – governance, 4 - economy, competitiveness and employment, and 6 - natural resources and environment) for the sustainable use and conservation of natural resources;
- the National Environment Policy, which links ecosystem conservation with livelihoods and sustainable development;
- the new Forestry and Wildlife and Climate Change laws;
- the law of Sustainable Use of Natural Resources which promotes conservation of natural resources and the environment and their sustainable economic use;
- the law of Conservation and Sustainable Use of Biological Diversity which fosters the conservation of biodiversity and the just and equitable distribution of benefits resulting from its use;
- the National Environmental Action Plan, which aims at reducing the deforestation rate on 54 million ha of primary forest, incorporating forests with undefined rights into the forestry classification system, and reducing the vulnerability to climate change; and
- the Law of Informed Prior Consultation (Law 29785), based on ILO Convention 169, which establishes the rights of indigenous peoples to be consulted regarding activities that affect their lands or natural resources.

At a sectorial level, the ER Program incorporates a number of recommendations contained in the World Bank's recent assessment of measures to increase agricultural productivity¹⁹ and contains a major focus on coffee, Peru's most important agricultural export, and cocoa, an increasingly important high value crop associated with social inclusion. In the forestry sector, the Program contributes to the National Forestry Plan and the National Forest Policy insofar that it focuses on sustainable forestry management and conservation by indigenous communities and thus helps to increase their well-being and social inclusion; it also promotes legal sustainable forest management in forestry concessions and reforestation and forestry institutional strengthening. Furthermore, the inclusion of increased forest conservation in

¹⁸ <http://documents.worldbank.org/curated/en/522711493949637279/Peru-Country-partnership-framework-for-the-period-FY17-FY21>

¹⁹ <http://documents.worldbank.org/curated/en/781561519138355286/Gaining-momentum-in-Peruvian-agriculture-opportunities-to-increase-productivity-and-enhance-competitiveness>

the Program is expected to result in biodiversity maintenance, since both regions have intermediate levels of endemism as well as intermediate numbers of endangered species.

The Program operationalizes the National Climate Change Strategy (ENCC) in the forest and land use change sector and is a major contributor to the implementation of the National Forest and Climate Change Strategy (ENBCC), which includes the national REDD+ Strategy. The ER Program and the ENBCC will thus help the State to achieve consensus regarding the use of forests and climate change and their importance for development. They will also contribute significantly to national efforts, within the context of the LULUCF NDCs, to reduce emissions resulting from deforestation and forest degradation, promote forest conservation and the sustainable use of natural resources and ecosystem services, and increase competitiveness at the national level, within a framework of sustainable economic development and social inclusion.

The proposed ER Program is derived from the mitigation component of the Forests and Climate Change (and REDD+) Strategy. As such, the ER Program represents an important mechanism and learning experience for implementing the Strategy over large areas of Peru's national forests in the Amazon. Implementation will enable the testing of hypotheses related to causes and potential solutions of deforestation, the fine-tuning of management structures and intervention activities important for REDD+, including those related to enabling conditions, policies, institutional coordination, safeguards, benefit distribution, capacity strengthening, improvements in productivity, and market development; the identification of unforeseen gaps and needs; and in general, the improvement of the ENBCC design and future interventions. Likewise, the experiences and lessons learned from the ER Program interventions and the payments which result from them will help to fine-tune and extend the REDD+ system to other zones of the country in the future as well as improve Peru's ability to participate in and negotiate future sales of emission reductions.

At the regional level, the ENBCC and ER Program will contribute to the decentralization of forest and natural resource governance in the regions and will help operationalize the PDRCs (Regional Concerted Development Plans) and the protection-production-inclusion (PPI) development strategy of the Amazonian regional governments via the implementation of low emissions development practices, regional branding, and increasing competitiveness in emerging markets that incorporate and value elements of environmental sustainability.

Finally, the ER Program is politically important within the context of the FCPF's Carbon Fund. Since Peru is the only Amazonian country that has submitted a proposal to the Fund, the experience of the project will be relevant to Amazonian conditions beyond Peru's borders.

2.3 Political commitment

The ERP and REDD+ enjoy high level political support. In recent years, the country has advanced a series of important regulatory, institutional and technical processes, with the purpose of moving towards an effective management of climate change, as a key element to ensure the sustainability of its development in the long term. Among these processes, the following stand out:

- 1) The approval in 2015 of the National Climate Change Strategy (ENCC), which made it possible to define the scope of the climate change issue in Peru.

2) The formulation of the Nationally Determined Contributions (NDCs) in 2015 (including 8 mitigation measures linked to the LULUCF sector and 12 adaptation measures associated with forest ecosystems), which demonstrate the level of national commitment to solve the problem of climate change and its effects and to transition to more sustainable development models.

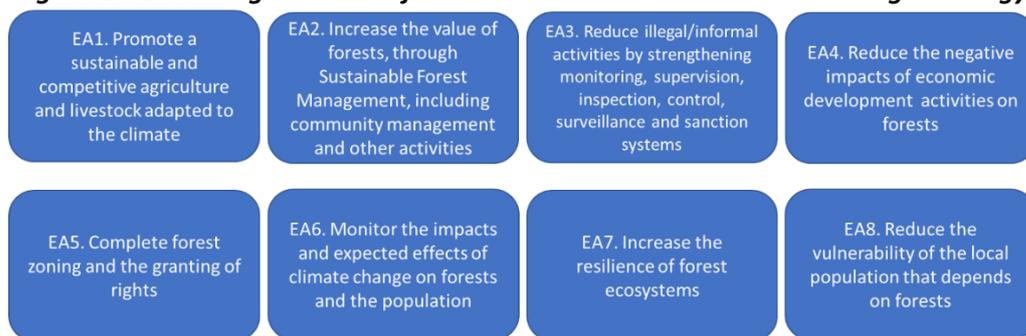
3) The approval and regulation of the new Forestry and Wildlife Law aimed at sectorial reform.

4) On-going collaboration between MINAM and MINAGRI/SERFOR, the two Ministries involved in forest and climate change governance, regarding their joint leadership and responsibilities for governance and coordination of the National Forest Conservation and Climate Change Strategy and National Forest Cover Monitoring System, the LULUCF sector NDCs, and the DCI. MINAGRI and PNCB are also involved in the process of developing, with the aid of the Green Commodities program of UNDP, four Nationally Appropriate Mitigation Activities (NAMAs) related to coffee, cocoa, livestock, and biofuels, which will provide political support for the ER Program in these thematic areas. They are also collaborating on the design of the framework for forest and climate change governance (see below).

5) The approval in 2016 of the National Forest Conservation and Climate Change Strategy (including the national REDD+ strategy), which aims at decreasing emissions due to deforestation and forest degradation and increasing adaptation to climate change, thereby increasing the well-being and development of forest-dependent populations. The Strategy's strategic lines of action are shown in Figure 2.3.1. Within the ENBCC, REDD+ is the principal mechanism of GHG emission mitigation and contributes to efforts to reduce deforestation and forest degradation via five eligible activities related to Strategic Actions 1.2-1.6 as well as transversal actions.

In addition, the approval of the Framework Law on Climate Change²⁰ (LMCC) in April 2018, after a complex process of coordination between the Executive and the Congress, has resulted in a clear strengthening of public institutions and coordination bodies regarding the issues of climate change and REDD+, placing Peru as the first South American country in having approved such legal instrument. To date, the LMCC is being translated in at least five different local languages: Quechua, Aymara, Shipibo-Conibo, Awajun and Asháninka.

Figure 2.3.1. Strategic Actions of the National Forests and Climate Change Strategy



MINAM, 2016

More recently, a serie of decisions has improved the overall political landscape for the development of REDD+, as forests have begun to enter explicitly into discussions and decision-making processes regarding national development, especially in Peru's Amazon region.

²⁰ <https://busquedas.elperuano.pe/download/url/ley-marco-sobre-cambio-climatico-ley-n-30754-1638161-1>

Among the decisions that need to be highlighted are the establishment, by Supreme Resolution N° 154-2018-PCM in August 2018, of the Multisector and Intergovernmental Commission for the Establishment of Priority Public Actions for the Promotion of the Sustainable Development of the Territories of the Amazon (MIC), which aims to identify public actions highly relevant for the promotion of sustainable development of the Amazon, as well as an Action Plan 2018-2021. This commission has five specific working groups: a) Policies, programs and activities for sustainable productive development, b) Comprehensive review of forest policy instruments, c) Models of provision of social services for the territories of the Amazon; d) Land titling of indigenous communities and e) Consolidation of funding sources to promote the sustainable development of the Amazon.

Another important process is the start of the discussion with multiple stakeholders on Forest and Climate Change Governance, launched in November 2018, which seeks to establish a definitive high-level multi-level, multi-stakeholder and multi-sector coordination and articulation body for forest management and climate change, so as to reduce emissions from deforestation and forest degradation, promote sustainable development and improve the quality of life of local populations.

A recent example of policy alignment among sectors is Supreme Decree N° 005-2018-MTC, which established that the Ministry of Transportation and Commerce (MTC) should amend the Classification of Roads in the National Highway System to exclude the routes and/or projected road sections cutting across Natural Protected Areas and buffer zones or Territorial Indigenous Reserves that have not been awarded a compatibility certification by the national protected areas authority.

Additionally, it is necessary to highlight the "Priority Axes to Combat Deforestation" proposal, presented in December 2018, in the framework of the last Executive GORE²¹ of the year, which seeks to value forest as natural capital, by actions in four areas: 1) institution building and governance, 2) integrated territorial management, 3) sustainable production and 4) the fight against illegal economic activities. The proposal has been jointly prepared by the Ministries of the Environment (MINAM), Agriculture and Irrigation (MINAGRI) and Energy and Mines (MINEM). The proposal defines targets to be achieved by 2021 in the different dimensions of each area, as well as the responsibility of different stakeholders for their achievement.

Regional governments have also taken the initiative to design and implement low emissions development roadmaps, investment plans, goals, and indicators. San Martín and Ucayali have based their development plans on a Production-Protection-Inclusion (PPI) approach and other Amazonian regions are beginning these processes, with assistance from the Earth Innovation Institute (EII) and funds from Norway, as part of their participation in the Governor's Climate and Forest Task Force (GCFTF).

Regional Governments

New regional government authorities were elected and took office in 2019 with clear political messages and priorities which are closely related with activities prioritized in the current ERPD.

In the case of the Government of San Martín, its main message is called "revolución productiva" (productive revolution), which means that they will focus their efforts on surpassing historical yields of

²¹ The Executive GORE, according to the Presidency of the Council of Ministers (PCM), is a coordination space in which the Ministers have a bilateral dialogue with the Regional Governors and their respective technical teams, thus enabling the strengthening of trust relationships and improving mutual knowledge of the responsibilities they have in charge.

principal crops such as oil palm, cocoa, and coffee. This goal is aligned with strategic action 2.2 (*Promote increases in productivity, intensification, quality, and commercial contacts of coffee and cocoa grown in deforested areas*) and is one of the areas that underlies GORESAM's commitment to this proposal and its implementation.

In the case of the Government of Ucayali, their deforestation reduction strategy is focused on reducing poverty by ensuring food security. In that sense, they assign particular importance to strategic action 2.3 (*Strengthen familiar agriculture from a subsistence level to a level that generate surplus for market*) as the one that will contribute to reducing forest loss and increasing farmer well-being in the coming years.

This is seen in the plans and directions of the San Martín and Ucayali regional governments. In both regions there are working groups dedicated to defining and implementing a strategy of low emissions development. In San Martín, the regional government (GORESAM) has completed economic-ecological zoning at the macro-scale for the entire region, as well as selected provinces at the meso level. Currently, in parallel with Forest Zoning, the Regional Agriculture Directorate (DRA) has begun the process of Agroecological Zoning (ZAE). There are 10 Provincial Forestry/Agriculture Committees for articulation between public and private sectors, as well as 9 Technical Boards in prioritized value chains. The Economic Development Directorate (DRDE) of the regional government is also promoting a diversified low emissions economy and has developed regional branding for exportable products based in part on reduced deforestation and good socio-environmental practices.

In the forestry sector, San Martín has a Regional Forestry Plan (Regional Ordinance 008-2008-GRSM / CR) that establishes four components: productive forest management program, conservation and environmental services, reforestation, and agroforestry, and transversal actions. Initiatives under this Plan include the Regional Strategy of Monitoring and Control of Forests and Wildlife (Regional Ordinance 004-2014-GRSM/CR), the Regional Platform for Community Forest Management (Regional Ordinance 014-2014-GRSMCR), and a policy (Regional Ordinance 015-2013) which ensures the legal origin of forest products purchased by GORESAM. The regional government is also carrying out forestry zoning and has piloted the delegation of competencies for forest control and monitoring, the operation of transformation activities, and the granting exploitation rights to local governments (Regional Ordinance 009-2015-GRSM/CR). Since 2011, San Martín also has a Regional Conservation System (SRC), which emphasizes participative management, organization of local populations, and alliances with international cooperation. In December 2017, San Martín was the first region to grant Cession of Land Use Contracts for agroforestry systems, a new usufruct allocation right created by the Forestry Law in order to formalize smallholder producers in areas classified as forest use in the Peruvian Amazon. This mechanism is being implemented with the assistance of ICRAF.

Similarly, the regional government of Ucayali (GOREU) has also recently developed a regional strategy for low emissions economic development with technical support from the Earth Innovation Institute. Pillars of the strategy include increased productivity of the main commercial crops of Ucayali (oil palm and cocoa), the reduction in annual deforestation, ecological-economic macro-zoning (approved in 2017), and the implementation of forest zoning (under the Forest and Wildlife Management Directorate). In 2017, SERFOR and Ucayali signed an agreement to establish a SERFOR liaison office in the region. Ucayali is also in the process of establishing new protected areas (Regional Conservation Areas such as Alto Tamaya - Abujao and Laguna Encantada de Atalaya) to complement the 3.2 million ha of national ANPs found in Ucayali.

In 2017, the Ucayali Regional Agriculture Directorate (DRA) began the preparation of an Integral Plan for Agricultural, Forestry (non-timber) and Aquaculture Development. An approved Competitiveness Plan of Palm Oil Ucayali 2016 – 2026 also exists (Regional Ordinance 006-2016-GRU/CR). The regional government also maintains two projects to support the value chains of coffee (in Padre Abad and Atalaya districts) and cocoa (in Father Abad province and the districts of Nueva Requena and Raymondi).

With regards to the private sector, in 2017 a Public-Private Coalition, composed of 52 representatives of regional and district governments, the private sector, and civil society organizations was formed to guarantee rights to forests and lands by indigenous communities and forestry and agricultural producers, optimize the sustainable use of forestry landscapes, strengthen enabling conditions, and generate the changes necessary in order to aspire to low emissions rural development. The principal objective of this multi-stakeholder platform is to decrease deforestation through the application of a series of economic and financial incentives involving public, private, and civil society sectors, as well as the promotion of deforestation-free supply chains of coffee, cocoa, and oil palm. Clearly, the ER Program is aligned with this initiative and will help contribute to its agenda. Other private sector organizations supporting the ER Program are those for investment promotion, ProUcayali and ProSanMartin; the latter is in the process of formation and is supported by various chambers of commerce in San Martin.

Finally, Peruvian government contributions to internationally funded projects represent concrete measures to reduce emissions from land use and land use change and is further evidence of political support for reductions of deforestation and forest emissions. These projects provide the basis for most of the ER Program activities. They include the following:

- Since 2011, Peru has also been an observer of the UN-REDD+ Program as well as the REDD+ Partnership and has received targeted support for REDD+ related technical cooperation from UNDP (2 projects), UNEP (1 project) and FAO (1 project) and is starting a 2-year-long Country Program of support for the development of REDD+.
- Joint Declaration of Intent between Peru, Norway and Germany (DCI). During 2014, Peru signed an important commitment with the governments of Norway and Germany (called Joint Declaration of Intent between Peru, Norway and Germany - DCI) to receive up to US\$ 300 million in exchange for a series of measures aimed at zero deforestation. The DCI includes a 3-phase process that began in 2015 and will be completed by 2020. In Phase I, Peru approved the ENBCC, produced an official report on gross deforestation in the Peruvian Amazon for the period 2000 - 2013, submitted the Reference Level for forest carbon emissions from the Peruvian Amazon to the UNFCCC, issued an initial report on the National Safeguards System, and promulgated the Regulations of the Forestry Law and Wildlife. The work plan of Phase II has been designed in consultations between the governments of Peru and Norway and will start implementation in 2019. The goals for this stage include: cease authorizations of changes in the use of lands classified for forests and protection; reduce the area of forests with unassigned rights by 50%; legally recognize the possession of at least 5 million ha of indigenous lands through demarcation, titling, expansion and registration of indigenous communities; include at least 2 million ha of forests in the forest conservation incentive (conditioned direct transfer payments - TDCs) program in indigenous communities; and implement the projects of the Forest Investment Plan (FIP), which implies counterpart investments for US\$ 50 million.
- FIP/World Bank/IDB: The Forest Investment Program is working in 3 sub-national areas (Atalaya in Ucayali, the Tarapoto-Alto Amazonas corridor of Loreto and San Martin, and Madre de Dios) and at the national level in order to: strengthen forestry governance, classification zoning, and

use; the sustainable management of natural capital; forest conservation and the recuperation of degraded areas; and control of deforestation. Results-based payment are not contemplated in the FIP Program.

- Japan International Cooperation Agency (JICA): Supports forest conservation through capacity building and technical assistance. This project will help extend the Reference Level and MRV to dry coastal forests.
- Land Titling and Registration Program (PTRT3): Formalization of rural property in the Amazon regions and in focalized areas in the highlands; executed by MINAGRI.
- SERFOR/CAF: Finances the Program for Sustainable, Inclusive, and Competitive Forestry Development in the Peruvian Amazon. The Program is aimed at strengthening forest management capacities and at generating greater institutional articulation among the national, regional, and local levels for sustainable forest management. It also contributes to forest and biodiversity conservation and sustainable use.
- PPS/UNDP: The Sustainable Productive Landscapes (PPS) Program promotes deforestation-free sustainable production systems in order to generate multiple environmental benefits. The Project works with policies and regulations at the national and with territorial management in Huanuco and Ucayali at the regional level and covers 2.2 million ha of forests.
- Earth Innovation Institute/IKI/NICFI/UNDP: Provides assistance to the Amazon regional governments in developing strategies for low emissions development, including the PPI strategy, and plans for financing the strategies.
- CIAT/IKI/MINAM: The project aims at developing the capacity of the national environmental authorities and local farmers in the Amazonian regions of Peru (to be further narrowed) in order to reduce greenhouse gas emissions and advance efforts to adapt to the impacts of climate change. The project is in a preliminary phase and will identify specific regions and value chains for interventions.

3. ER PROGRAM LOCATION

3.1 Accounting Area of the ER Program

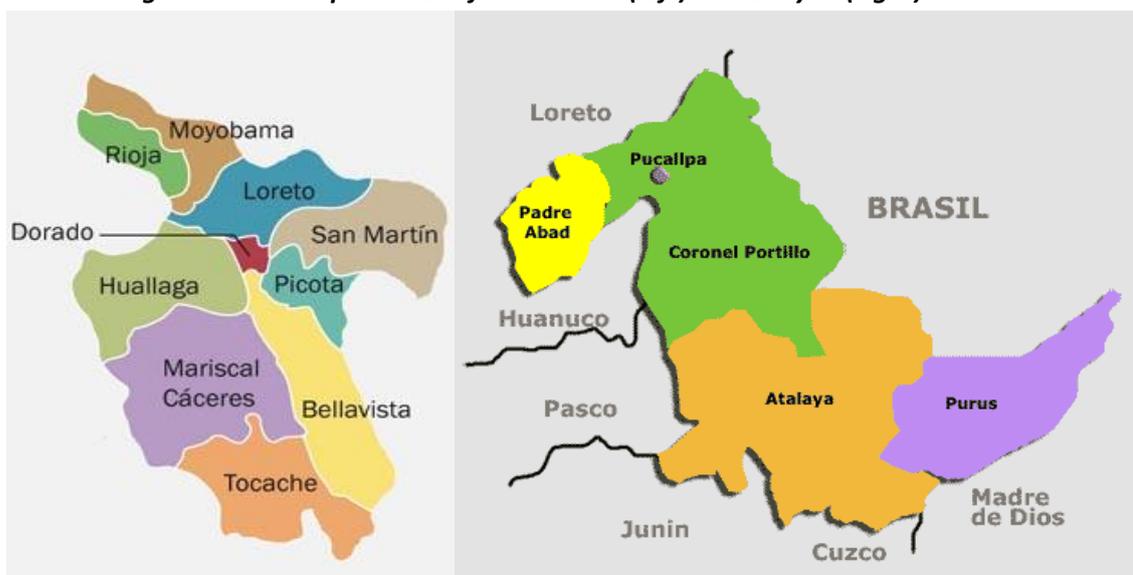
The accounting area is comprised of two political jurisdictions: the regions²² of San Martin and Ucayali. San Martin is found in the north-central Peruvian Amazon and runs eastward from the foothills of the Andes to the largest Amazonian region, Loreto. Ucayali is found south-east of San Martin in the central Peruvian Amazon. Its eastern border abuts Brazil and Madre de Dios; it shares its western border with a number of Andean-Amazon regions of Peru (Figure 3.1.1). Ucayali is divided into 4 provinces (Coronel Portillo, Purus, Atalaya, and Padre de Abad) and 17 districts. San Martin has 10 provinces and 77 districts (Figure 3.1.2 and Annex 1).

Figure 3.1.1. Map of the accounting area.

²² The region is a sub-national political jurisdiction equivalent to departments or states.



Figure 3.1.2. The provinces of San Martín (left) and Ucayali (right)



Together, both regions have a territory of 161,663 km² (51,253 km² in San Martín and 110,410 km² in Ucayali), equivalent to about 21% of the total area (775,353 km²) of the Amazon. The regions have a combined forest area of about 12.7 million ha (3,365,916 ha in San Martín and 9,362,764 ha in Ucayali),

equivalent to 19% of Amazonian forests (68.6 million ha). However, they are responsible for a disproportionately higher rate of deforestation (35% of deforestation in the Amazon between 2008 and 2017) than what their area would suggest (Table 2.2.1).

3.2 Environmental and social conditions in the Accounting Area of the ER Program

The accounting area is found on the eastern slope of the Andes and is characterized by a topographic transition from the Andean uplands and mesas in the west to the plains of the Amazon basin in the east. Elevations vary from 3080 - 150 m above sea level (masl) along this transition. In San Martin, the uplands and high jungle, where the topography varies from abrupt escarpments to broken topographies and hills interspersed with broad valleys, predominate (88% of the land area), while the Amazon plains (12% of the total area) are mainly found in the northeast sector (Figure 1.3.3) On the other hand, Ucayali is mainly Amazon plain, with a strip of highlands along the western border of the region.

Climate varies with elevation. The Amazon plains are hot (24° – 26°C) and humid and receive up to 3000 mm of rainfall annually, with a drier season (50 mm/month) during the austral winter when cold waves (temperatures of 10° - 15° C) may also occur. The uplands are cooler and also rainy (1500 – 7000 mm/yr, with a rainy season between November – Abril and a dry season from May – October. Due to rain shadow effects, some areas in San Martin are noticeably drier (e.g. the central Huallaga area, Picota, Bellavista, and the Mayo Rivers area around Sisa and Roque in San Martin), than the surrounding region. Given the high rainfall, flooding along the upper reaches of the major rivers, the Huallaga, Mayo, and Ucayali, can occur during January – March (e.g. Tocache in San Martin).

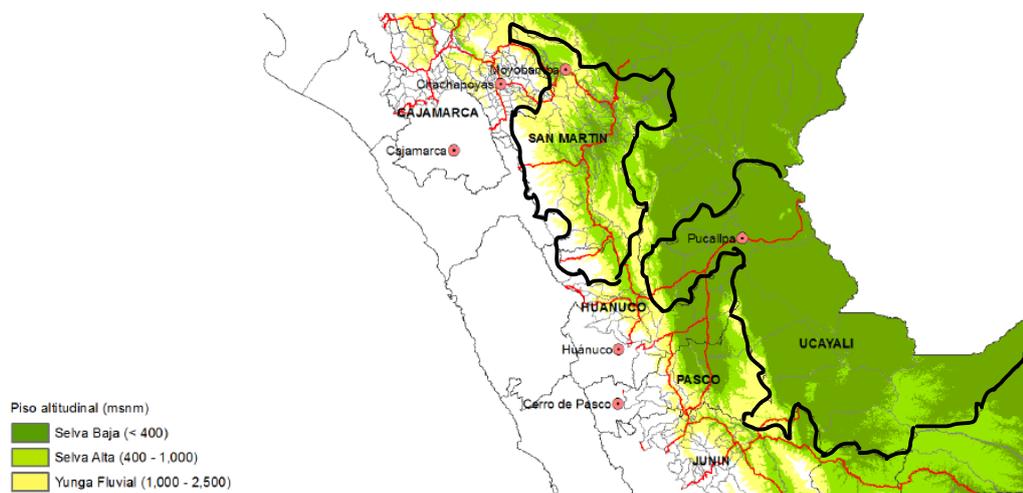


Figure 3.1.3 Topographic gradients in the accounting area.

Due to the heterogeneous topography and the influence of rivers, soils are variable. Generally, their fertility declines on a west-east axis as distance from the mountains and temperatures and rainfall increase. Soils in the uplands and broad intermountain valleys are fertile as are alluvial soils found on the flood plains of the major rivers, especially “white” water rivers that arise in mountainous areas with basic sediments. Predominant soils in the uplands and valleys are classified as Entisols, Inceptisols, Alfisols, Mollisols, or Vertisols; they may be deep and well-drained in the valleys, but superficial in the upland topographic positions. In the lowlands, soils are classified as Ultisols, Spodosols, or Inceptisols; the former two are deep and infertile, whereas the latter may be fertile or infertile depending on the nature

of the sediments of which they are formed. The organic matter percentage of soil is generally high in the highlands (where the soils are superficial), and in the valleys or seasonally flooded areas.

At the macro level, there are 3 biogeographic zones: the Puna (> 2500 masl), the Yungas (600 - 2500 masl) and the lowland jungle (< 600 masl) (Figure 1.3.3). The Yungas and lowland jungle correspond to the 3 forest types used in the reference level: high jungle with difficult access, accessible high jungle, and lowland jungle. In the *Puna* and Yungas, there are 3 types of forests: a) montane rainforests found between 600 – 1400 masl, characterized by trees up to 35 m in height, dense undergrowth, and a large number of palm species; b) cloud forests found between 1300 – 2550 masl in persistent fog zones, where forests are short-statured and twisted, tree ferns and epiphytes are common, and the soil is covered by a layer of organic matter and moss; and c) dwarf forests located between 2500 – 3800 masl that have a long history of human intervention and are frequently converted into herbaceous vegetation and agriculture.

In the low jungle, forests can be divided into upland and seasonally inundated forests. The vegetation of the former is diverse and varies with topographic position and soil type. The latter contain zones of *aguajales* that are found in humid or permanently flooded areas where forests are uniform and dominated by a palm (*Mauriticia flexuosa*). Periodically flooded flood plains often have almost pure stands of fast-growing commercial species such as bolaina (*Guazuma crinita*), capirona (*Calycophyllum spruceanum*), and cumala (*Virola sebifera* Aubl).

The heterogeneity of forests, topography, climate, and soils results in high biodiversity and endemism. Surveys of diversity in the protected areas attest to this diversity, but it is likely that much of this diversity is still presently undiscovered.

With regards to socioeconomic characteristics, the combined population of the accounting area is about 1.3 million inhabitants (Table 3.1.1). San Martín's population is larger, poorer, and more rural than that of Ucayali. Rural population density is almost 6 times greater in San Martín (5.5 persons/km²) than Ucayali (0.85 persons/km²) due to a larger general population and larger percentage of rural dwellers than Ucayali. San Martín's economically active population (EAP) and gross regional product (GRP) are greater than that of Ucayali (Table 3.1.1), but large percentages (around 50%) of the EAP are involved in the agriculture/livestock/forestry sector in both regions. According to the regional governments, San Martín has about 4 times more land that is apt for farming than Ucayali (698,000 ha vs. 187,000 ha) and has about 3 times more farms than Ucayali (about 100,000 farms in San Martín vs. 32,000 in Ucayali).

Migrants make up a significant portion (8%) of the regions' population and 38% of the EAP. In both regions net immigration is among the highest in Peru. Migrants make up 45% of employment of the agricultural/forestry sector in both regions. The majority (about 60%) of the migration to San Martín originates from the nearby Amazonas and Cajamarca regions; out-migration is mainly to Lima (33%) and Loreto and Ucayali (a combined total of 27%). In the case of Ucayali, almost 70% of the migrants originate from the neighboring regions of Loreto, Huánuco, and San Martín; out-migration is mainly to Lima (40%), Loreto (19%), and Huánuco (13%).

Although almost 90% of the forests are classified and zoned,^{23,24} 16% of Ucayali forests and 33% of San Martin forests do not have property or concessionary rights.²⁵ About half of Ucayali's forests are found in protected areas or in 273 indigenous communities (about 2.25 million ha each), as are those of San Martin. In San Martin however, there are about 700,000 ha of indigenous lands in 89 communities and 1.1 million ha in protected areas. Approximately 56 indigenous communities in San Martin are untitled, whereas Ucayali has 46 untitled indigenous communities. Ten percent of the population identifies itself as member of an Amazon indigenous ethnicity and 5% as Quechua. Spanish is spoken as a first language by 87.6% of the population, while 6.6% speak Shipibo, 4.1% speak Asháninka, 1.5% speak Quechua, and 0.1% speak Aymara.

Table 3.1.1. Socioeconomic characteristics of the accounting region and the two regions.

<i>Characteristic</i>	<i>Accounting Area</i>	<i>San Martin</i>	<i>Ucayali</i>
Area (km ²)	161,633	51,253	110,410
Population (2015)	1,309,840	813,381	496,459
Population growth	1.5%	1.5%	1.5%
Rural population	29%	35%	19%
GRP growth		4.4% (2007-2015)	3.3% (2008-2017)
Agriculture/forestry/wildlife (% of GPP)	Approx. \$800 million	\$620 million (27%)	\$185 million (9%; 5.6% in forestry)
Average annual growth of agriculture/forestry/wildlife (%)		6.0%	n.d.
EAP	720,000	440,000	280,000
EAP agriculture/forestry/wildlife	49%	51%	45%
Poverty (extreme poverty)	19.7% (5.6%)	23.5% (6.5%)	13% (3.7%)
Illiteracy	6.2%	7.1%	4.6%
HDI national ranking		14/24	15/24
Land tenure		86% of forest lands are classified and zoned. 28% of forested land does not have assigned property or concessionary rights	88% of forest lands are classified and zoned. 10% of the forested areas does not have assigned property or concessionary rights
Indigenous communities		707,852 ha. 33 titled indigenous communities and 56 where land rights are incomplete or absent.	2.3 million Ha. 227 indigenous communities are titled, and another 46 have rights that are incomplete or absent.
Farms		698,000 ha apt for agriculture 100,439 farms	187,000 ha apt for agriculture 32,000 farms
Protected areas		1.10 M ha. Forest concessions and protected areas are under pressure from invasion and overlapping rights.	2.24 M ha. Forest concessions are under pressure from illegal logging.
Road and road density (km roads/1000 km ² territory)		Approx. 5200 km; (102)	2507 km; (23)
Migration	Make up 38% of EAP and 45% of the EAP of the agriculture/forestry sector	8% of population are recent migrants (last 5 years); 35% of EAP, and make up 45% of EAP of the agricultural/forestry sector	8% of population are recent migrants (last 5 years) 42% of EAP, and make up 45% of EAP of the agricultural/forestry sector

GRP: gross regional product; EAP: economically active population; HDI: Human Development Index

Sources: GOREU (2017) Ucayali: Región Productiva. www.regionucayali.gob.pe. GORESAM (2017) San Martin Región: Producir, proteger, e incluir. Banco Central de la Reserva Perú (2017) Informe Económico y Social. Región San Martin. Gerencial Regional de Desarrollo Económico, Gobierno de San Martin (2016) Plan de Desarrollo Económico Regional 2016 – 2021. PERX Ucayali

²³ GOREU, 2017. Ucayali: Región Productiva. www.regionucayali.gob.pe,

²⁴ GORESAM, 2017. San Martin Región: Producir, proteger, e incluir.

²⁵ Based on GIS analyses of MINAM. These include forests with unassigned rights and non-concessioned permanent production forests (PPF).

4. DESCRIPTION OF ACTIONS AND INTERVENTIONS TO BE IMPLEMENTED UNDER THE PROPOSED ER PROGRAM

4.1 Analysis of drivers and underlying causes of deforestation and forest degradation

Context - Deforestation in the Peruvian Amazon

Peru is the second country with the largest area of rainforest in Latin America. However, accelerating deforestation and forest degradation are threatening its diverse natural resources. According to MINAM, between 2008 and 2017 deforestation of Peru's Amazon ecoregion, which includes about 95% of the country's forests, occurred at an average rate of 147,198 ha/yr, an increase of 56% compared to the average annual deforestation of 94,021 ha/yr measured between 2000 and 2007 (Figure 4.1.1). Historically, annual deforestation attained its highest value of 177,566 ha in 2014, and has since fluctuated around a value of about 159,000 ha/yr.

Deforestation and its reduction play a major role in Peru's strategy to reduce greenhouse gas emissions. In Peru's nationally determined contributions (NDCs) reported to the UNFCCC in 2015, deforestation was estimated to contribute to 51% of the country's total GHG emissions (InfoCarbono, 2014)²⁶. By 2030, another 3.5 million deforested hectares are projected to be added to the 7.3 million already existing hectares that are actually deforested (Figure 4.1.2), resulting in an increase of more than 50% in both national as well as Land Use, Land Use Change, and Forestry (LULUCF) sector emissions. At the same time, Peru expects that mitigation of about 53,600,000 tCO₂e/y of emissions from the same will contribute to two-thirds of Peru's expected emission reduction goal of 30% in 2030 (MINAM, 2015)²⁷.

Deforestation during 2008 – 2017 in the 15 regions that make up the Peruvian Amazon is shown in Figure 4.1.3. Five of the regions - San Martin, Ucayali, Loreto, Madre de Dios, and Amazonas - are found entirely within the Amazon, whereas the others have lesser portions of their territory there. Three (Loreto, San Martin, and Ucayali) of the five regions found entirely in the Amazon contribute the majority (55%) of deforestation found in the entire region.

²⁶ INFOCARBONO. National Inventory of Greenhouse Gases, 2012. MINAM, Lima, Peru. <http://infocarbono.minam.gob.pe/inventarios-nacionales-gei/inventario-nacional-de-gases-efectos-invernaderos-2010-2/>

²⁷ MINAM (2015). <http://www.minam.gob.pe/wp-content/uploads/2015/06/contribucion-NDC21.pdf>

Figure 4.1.1. Deforestation in the Peruvian Amazon, 2000-2016 (PNCB-MINAM, 2018)

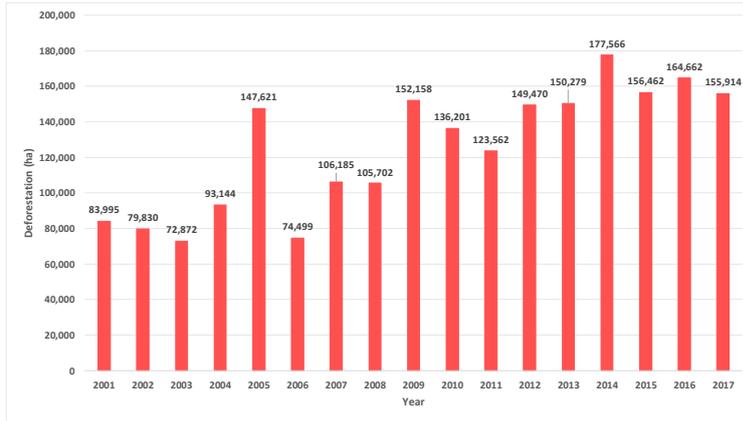


Figure 4.1.2. Anthropogenic gross deforestation and proposed forest emissions reference level (tCO₂e) (MINAM, 2015)

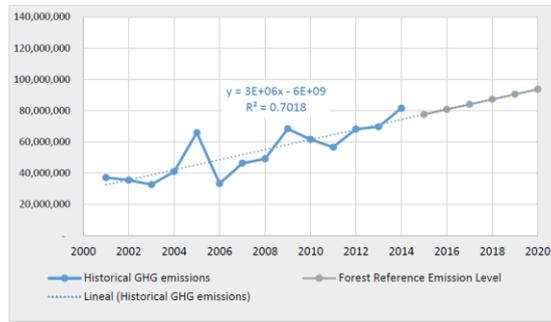
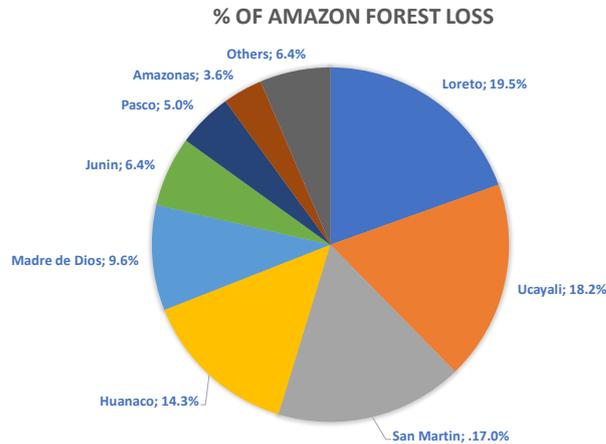


Figure 4.1.3. Regional contributions to loss of Amazon forests during 2008 – 2017 (PNCB-MINAM, 2018)



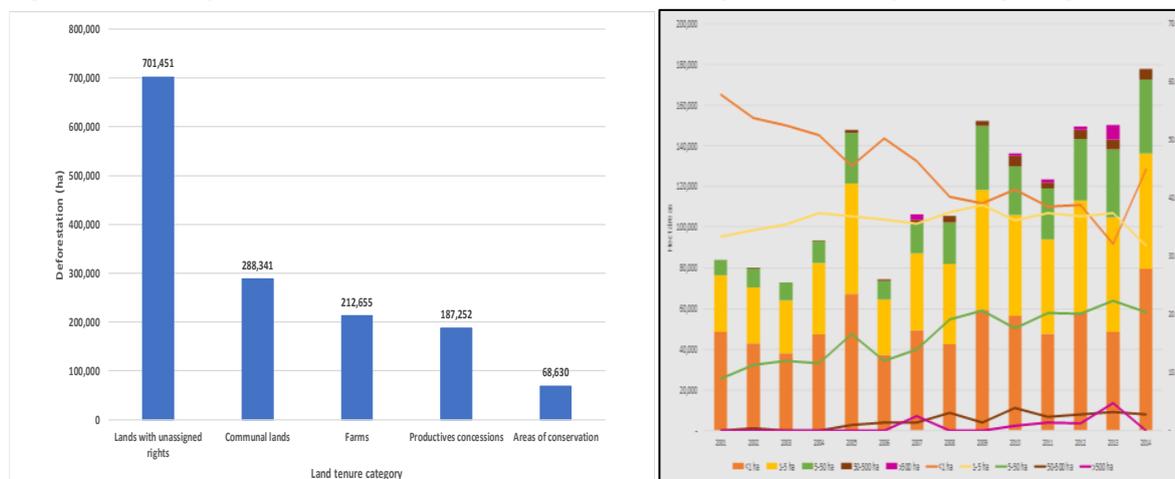
On a landscape scale, the Amazonian highlands (1000 – 2300 m above sea level - masl) and high jungle (400 – 1000 masl) have the least forest cover due to historical processes of migration and deforestation, whereas the low jungle (less than 400 masl) has the greatest amount of forest, but also the highest current rates of deforestation as well as the greatest amount of deforested land (Table 4.1.1).

With regards to land tenure, during 2008-2017 most (40%) of the deforestation occurred on lands without clearly defined rights, i.e. unassigned lands or non-concessioned permanent production forests (PPF), followed by 22% in communal lands (indigenous or campesino communities + indigenous territorial reserves), titled private farms (16%), productive forest concessions (14%), conservation areas (4%), and other areas (4%) (Figure 4.1.4). Analyses^{28,29} suggest that deforestation occurs on a small scale (about 88% of deforestation occurs on a scale of less than 5 ha) and is associated with agriculture practiced by small and medium-sized landholders (Figure 4.1.4). According to Robiglio et al (2015), 90% of deforestation occurs as openings of areas of less than one hectare and the main direct drivers of deforestation are agriculture and livestock. In effect, these are micro-deforestation processes that, in aggregate, cause significant losses of forest cover and degradation of existing forests.

Table 4.1.1. Forest cover and forest loss in the three Amazon landscapes (Robiglio et al., 2015 based on data from the 2012 national agriculture census)

Landscape	Forest cover, 2011 (ha)	% of total forest cover	Forest loss (2000-2011) (ha)	% of total forest loss	Relative annual rate of forest loss (%)
Highlands	7,676,400	11	295,394	26	0.37
High jungle	7,334,090	11	195,672	18	0.26
Low jungle	53,101,311	78	646,896	56	0.12
Total	68,111,801	100%	1,137,962	100%	0.16

Figure 4.1.4. Deforestation in relation to land tenure (left) and size of clearings (right) (MINAM).



At a more local scale, deforestation intensity is associated with 1) distance to roads or rivers that enable access to markets (associated with the majority of deforestation; 2) distance from population centers, and 3) topography³⁰. However, the evolution of deforestation on the agricultural frontier is varied and depends on the types and origin of farmers involved, migratory and colonization processes, the history of land use, the principal crops and dominant productive strategies, the size of landholdings, and the opportunity to access incentives provided by development programs (Robiglio et al., 2015 obs).

²⁸ Estrategia Nacional de Bosques y Cambio Climático (2016). MINAM, Lima, Peru.

²⁹ Robiglio, V., M. Reyes Acevedo, and E. Castro Simauchi (2015). Diagnóstico de los productores familiares en la Amazonía Peruana. ICRAF Oficina Regional para América Latina, Lima, Perú.

³⁰ Zegarra, E. and J.P. Gayoso (2015). Cambios en la agricultura y deforestación en la selva peruana: análisis basado en el IV Censo Agropecuario, p. 225-286, in Escobar, J., R. Fort, and E. Zegarra (eds.) *Agricultura peruana: nuevas miradas desde el Censo Agropecuario*. GRADE, Lima, Peru.

Drivers of deforestation in the Peruvian Amazon

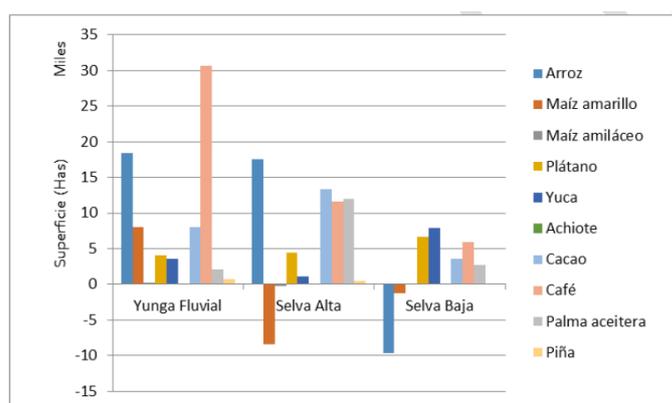
Drivers of deforestation in the Peruvian Amazon are diverse and include agricultural expansion, land speculation/trafficking, legal or illegal logging, and illegal activities such as mining and coca production. Order-of-magnitude estimates, based on different time intervals, suggest that agriculture, coca production, mining, land speculation, and the combination of logging and other uses each contribute about 20% - 25% to annual deforestation³¹.

Agriculture. The volume and value of agricultural production has grown steadily and has become increasingly oriented towards external markets. These production increases have come mainly from expansion of the agricultural frontier, which poses high environmental costs in terms of deforestation³² (World Bank, 2017), rather than increases in productivity, which has stagnated and is associated with the use of unproductive, smallholder agricultural systems that are poorly integrated into markets. As a result, the Amazon produces 13% of agricultural GDP, despite containing 38% of the country's agricultural land³³. Underlying causes of low productivity include the low use of technology or inputs caused by low levels of capital, little access to credit and technical assistance, low levels of producer organization, and lack of connectivity and access to markets (see Annex 2).

Industrial or export crops account for 38% of the area under crops or fallow and include coffee (25.4%), cocoa (8.7% but accelerating greatly), and oil palm (1.8%, but also accelerating). Pastures used for extensive grazing account for another 25% of the agricultural land, followed by other, including subsistence, crops (27%). Figure 4.1.5 shows that during 2004 – 2010 coffee increased greatly in the highlands, while in the high and low jungle areas, increases in coffee, cocoa, and oil palm are observed. The increase of permanent crops in the lowland jungle is only about one-third that observed in the other two landscapes.

Greater detail on agricultural-driven deforestation and drivers is presented in Annex 2.

Figure 4.1.5. Net changes in the area of annual and permanent crops in 3 landscapes in the Peruvian Amazon, 2004-2010 (Robiglio et al, 2015).



³¹ Robiglio et al, 2015; CORAH, 2018 <https://mail.corahperu.org/index.php/estadisticas/#monitoreo>; Wake Forest University, 2018 www.sciencedaily.com/releases/2018/11/181108130525.htm

³² World Bank (2017) Gaining Momentum in Peruvian Agriculture: Opportunities to Increase Productivity and Enhance Competitiveness

³³ Based on data from MINAGRI, 2017. Boletín Estadístico de la Producción Agrícola y Ganadera 2017 and Robiglio et al, 2015.

Logging. Logging is another important activity in the Peruvian Amazon and the accounting area, but it is implicated in forest degradation, rather than a direct cause of deforestation (see below). Indirectly, however, the low economic return to forest use and management contributes to the conversion of forests to other uses.

In general, statistics for the timber sector are scarce and are made more unreliable by the large production of undocumented illegal wood. The following overview of the sector is based on official data from SERFOR for 2015 and a series of assumptions related to the proportion of exports to total wood production and legal wood production.

National timber production of about 2.3 M m³ is estimated based on exports (0.35 M m³) and the assumption that exports are equivalent to 15% of total production³⁴. This implies that 2 M m³ of wood produced annually is channeled to the domestic market, which is also supplied by approximately 0.8 M m³ of imports, thus giving a total domestic demand of about 3 M m³. Of the total estimated annual production of 2.3M m³, 1.4M m³ is official, thus implying that illegal wood contributes about 40% of domestic production (other reports that suggest that illegal wood is 40% - 62% of total production, see Mejia et al., 2015 *ibid* and Apoyo Consultorías, unpublished).

Most (48%) timber originates in native communities, 34% from timber concessions, and 17% from farms and local forests (Mejia et al., 2015 *obsit*). Small farmers and loggers make up about 40% of the actors involved in timber extraction, but account for only 2% of the volume of timber harvested (see Annex 2). Small farmers extract timber from their own lands or communities, while the great majority of small loggers operate without formal authorization and extract timber from public lands, farms, native communities, and concessions. Medium-sized loggers obtain wood from their own concessions as well as native communities and unauthorized sources; and large loggers use mostly their own concessions, but also buy authorized or unauthorized timber mainly from native communities, but also farmers and intermediaries (Annex 2).

It should be noted that since 2009, the forestry sector has been undergoing a slow process of reform, due to the need to comply with the Forest Chapter of the Free Trade Agreement between Peru and the United States. Some important milestones of this reform have been the transfer of competences in forestry to regional governments (since 2009), the promulgation of a new Forestry and Wildlife Law in 2011; and the creation of the Forest and Wildlife Service - SERFOR - in 2014 (see section 4.5). Nevertheless, legal annual production and wood exports have declined, largely due to questions about the source and legality of timber origin. Moreover, the area of certified forests in Peru has also decreased, from approximately 1 M ha in 2013 to 700,000 ha in 2016.

Mining. Small scale gold mining, mainly in Peru's southern Amazon has grown in importance since the early 2000s, coinciding with construction of a new modern highway connecting Peru and Brazil. In recent years, deforestation has increased. According to Wake Forest University's Center for Amazonian

³⁴ Mejia, E. et al. (20017) Actores, aprovechamiento de madera y mercados en la Amazonía peruana. CIFOR. Documento Ocasionales 145.

Scientific Innovation (CIN CIA), mining has caused the deforestation of 170,000 ha of primary rainforest in the last 5 years³⁵.

Coca. Finally, the area of coca in Peru has fluctuated between 40,000 and 62,000 ha (averaging 51,646 ha) since 2003. Since eradication eliminates on average 17,084 ha/yr (ranging from 7,022 to 35,868 ha/yr)³⁶, this would suggest that coca is responsible for about 17,000 ha of annual deforestation, assuming that the replacement of eradicated hectares comes at the expense of mature forest.

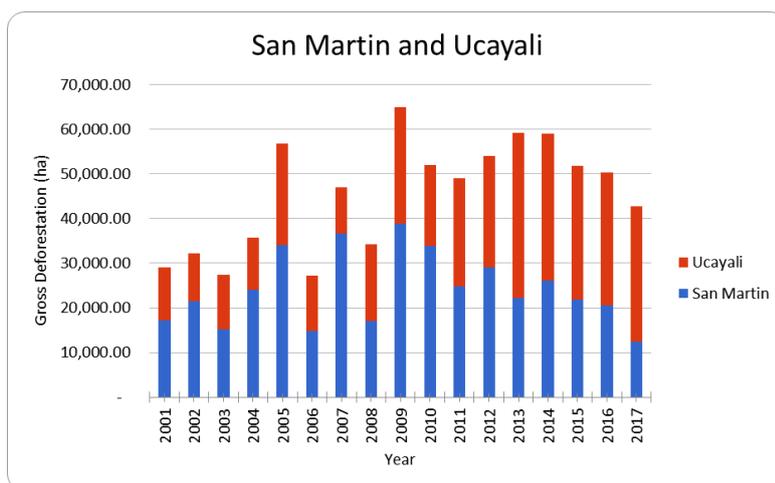
Deforestation and Forest Degradation in San Martin and Ucayali

Deforestation

By the end of 2017, accumulated deforestation in the accounting area (San Martin + Ucayali) contributed to 30% (2.31 million ha) of deforestation in the Amazon (7.5 million ha). Since 2000, annual deforestation in the accounting area has been variable. Average annual deforestation between 2008 and 2017 is 51,720 ha/yr, but has trended downward since 2013 (Figure 4.1.6 – it should be noted that from this point forward all data on deforestation and land use are sourced from the PNCBMCC GeoBosques Program, except when noted).

San Martin is the region with the greatest deforestation in the country, with 1.43 million ha of cumulative deforestation by the end of 2017. Historically, the average annual deforestation rate of San Martín during 2000 – 2017 (24,134 ha/yr, equivalent to 0.64% per year) is approximately 4 times the relative annual deforestation rate for the Amazon (0.16%) during the same period. In contrast, Ucayali is the third most deforested region, with 0.88 million ha of cumulative deforestation by the end of 2017. The region has a lower historic (2000 – 2017) average annual deforestation rate than San Martin: 21,316 ha/yr, equivalent to 0.22% per year.

Figure 4.1.6. Combined annual deforestation in San Martin and Ucayali, 2001-2017 (PCNB, 2018)



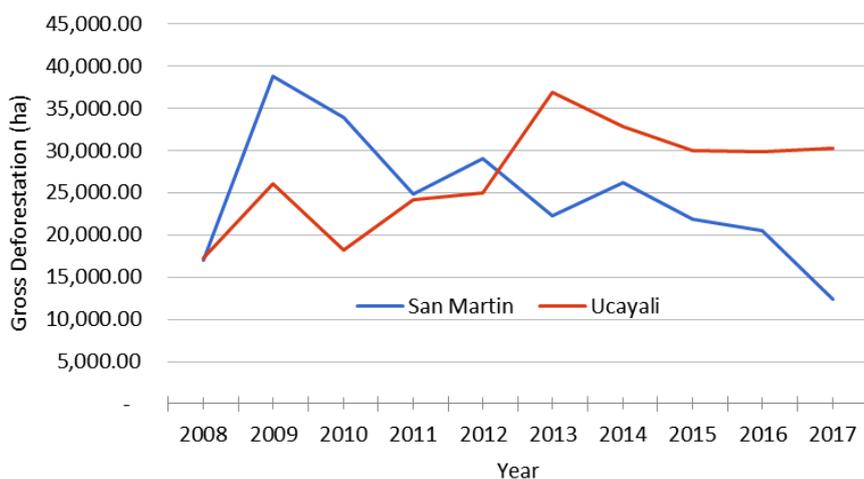
Although average deforestation during 2008 – 2017 is similar in San Martin (24,673 ha/yr) and Ucayali (27,047 ha/yr), the two regions show opposing recent tendencies: deforestation in San Martin has tended to decrease since 2010, but has increased since 2007 in Ucayali, although levels there have been

³⁵ www.sciencedaily.com/releases/2018/11/181108130525.htm

³⁶ CORAH (2018), <https://mail.corahperu.org/index.php/estadisticas/#monitoreo>

relatively constant between 2015 and 2017 (Figure 4.1.7). In San Martin, 79% of the deforestation was located in the highland jungle and highlands and 11% in the lowland jungle, but the pattern was reversed in Ucayali (93% of deforestation was located in the lowlands vs. 7% in the highlands), since Ucayali contains mostly lowlands.

Figure 4.1.7. Annual deforestation in San Martin and Ucayali, 2000-2017 (PNCBMCC-MINAM, 2018)

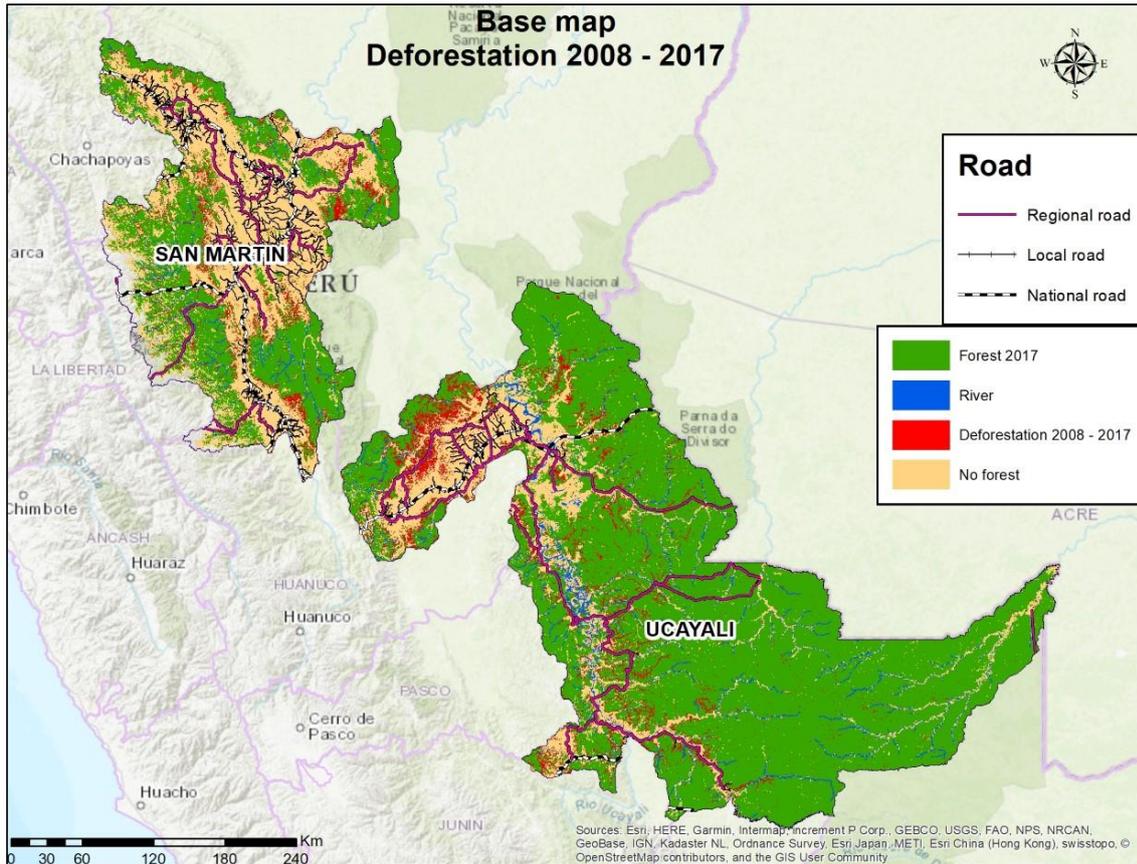


Deforestation hotspots

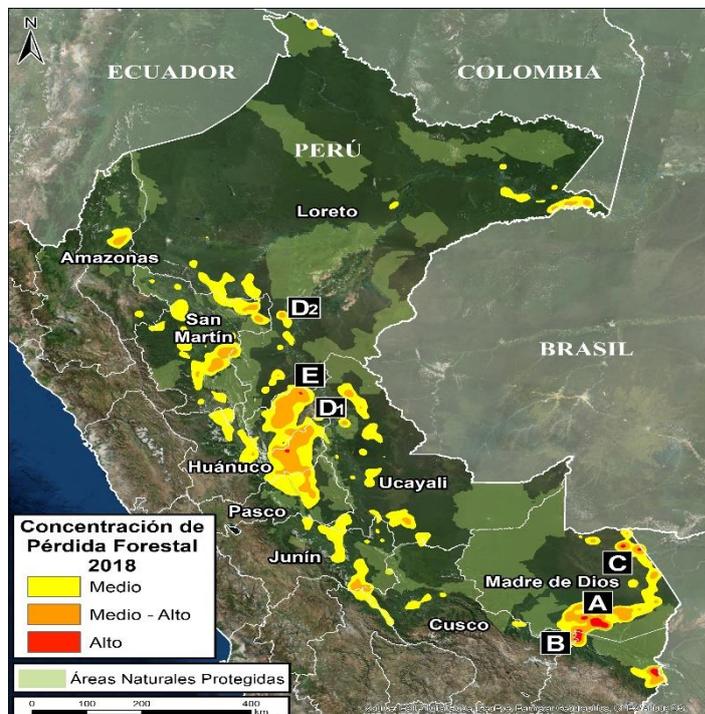
Although western and central San Martin suffered high rates of deforestation during the 1970s and 1980s, much of more recent deforestation is found in the northwestern and northeastern sectors of the region, where the recently improved and extended Northern Interoceanic Highway (IRSA Norte) has facilitated a high influx of migrants from the Andean region (Figure 4.1.8). Another area of recent deforestation includes the central and east-central areas influenced by the Marginal highway which runs down the north-south axis of San Martin as well as the highway which runs inland from the coastal region of La Libertad.

In Ucayali, since 2000 high rates of deforestation have been observed along the Federico Basadre highway, which runs from Lima to Pucallpa, the capital of Ucayali. The area starting about 60 km from Pucallpa going west is undergoing conversion to cacao, oil palm, and coffee. Other hotspots include the area bordering the Ucayali River and the Raymondi district in the province of Atalaya, Ucayali, which is located on the border between the Ucayali and Junín regions and is linked by a highway to Puerto Ocopa in Junín and the national highway network. In this zone, there are approximately 1.2 million hectares of mostly forested land, including permanent production forests, forest concessions, and wide tracts of forest within indigenous community lands (there are 82 indigenous communities located partially or wholly within the district). Deforestation is relatively low, but the recent linkage to the national highway network provides access to lands for newly arrived immigrants from the Andes, as well as attracting legal or illegal forest extraction activities. The existence of a shorter and faster road to market and of large areas of relatively unexploited forests are the chief incentives for forest industries to move from Satipo to Atalaya, just as in the past the industries moved from the forests in the central part of the country to Pucallpa. In contrast, the northeast and especially the southeast portions of Ucayali have large tracts of relatively intact forest which serve as the home of numerous indigenous communities.

Figure 4.1.8. Deforestation in the accounting area, 2008-2017, and hotspots, 2018.



Hotspots, 2018



At the district level, two potentially threatening situations are identified, based on absolute deforestation and the relative rate of forest loss between 2008 and 2017, and the quantity of forest remaining in 2017: 1) a relatively short-term threat where current rates of deforestation are high and

quantity of remaining forests are low (shown in red), and 2) a longer-term, but greater magnitude, threat to carbon stocks where current rates of deforestation are high and quantities of forest are large (shown in yellow). The results of this analysis are shown in Table 4.1.6 and the map of hotspots in Figure 4.1.9.

In San Martin, 18 of the 77 existing districts contributed 74% of the deforestation in 2008 – 2017. These districts lie along the IISA North highway in northern San Martin, western San Martin which is accessible by highway from the coast and the north-south Marginal highway, and southern San Martin, along the route of the Marginal highway. In nine of these districts, forests are at risk of being eliminated in the relatively short term, whereas eight are at risk of releasing important quantities of emissions in the medium-term due to high deforestation rates and large stocks of forests. The districts in the northwest are largely associated with coffee, those in the northeast and south with cocoa and oil palm, and those in the central and western portion of the region with cacao.

In Ucayali, 11 of the 17 districts contributed 93% of the deforestation in 2008 – 2017. These districts are found along the western portion of the Federico Basadre highway, and the Atalaya – Puerto Ocopa highway and along the Ucayali River in central Ucayali. In 5 of these districts, forests are at risk of being eliminated in the relatively short term, whereas six are at risk of releasing important quantities of emissions in the medium-term. The red districts in Ucayali in Figure 4.1.9 are associated with cocoa and oil palm, the yellow district to the west are associated with coffee and cocoa, and those in the central portion of the region are associated with cocoa and subsistence crop cultivation on the flood plains of the rivers.

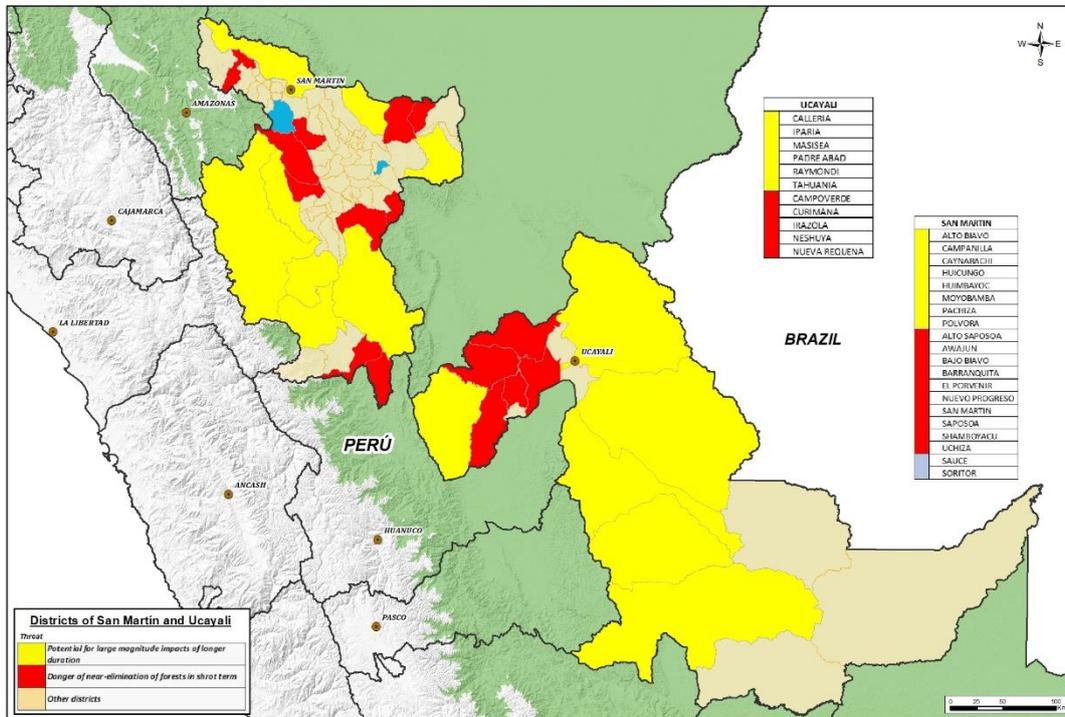
Table 4.1.2. Districts of San Martin and Ucayali threatened by deforestation (Danger of near elimination of forests in the short term; Potential for large magnitude impacts of longer duration)

San Martin Districts	Forest loss, 2008-2017 (ha)	Rel. annual rate of loss (%)	Remaining forest, 2017 (ha)	Threat	Ucayali Districts	Forest loss, 2008-2017 (ha)	Rel. annual rate of loss (%)	Remaining forest, 2017 (ha)	Threat
Moyobamba	27,735	1.31	185,420	Yellow	Irazola	34,372	2.35	114,393	Red
Alto Biavo	21,311	0.38	539,667	Yellow	Curimana	33,407	2.04	131,286	Red
Huicungo	16,054	0.22	714,971	Yellow	Padre Abad	31,958	0.79	373,378	Yellow
Bajo Biavo	14,972	2.22	53,387	Red	Raymondi	31,168	0.23	1,338,992	Yellow
Alto Saposoa	10,877	0.9	109,886	Red	Nueva Requena	24,269	1.45	143,772	Red
Barranquita	9,570	1.33	62,904	Red	Campoverde	18,432	4.16	27,708	Red
Pachiza	8,728	0.54	153,652	Yellow	Iparia	17,178	0.27	628,660	Yellow
Campanilla	8,713	0.56	148,109	Yellow	Calleria	15,901	0.15	1,056,408	Yellow
El Porvenir	7,914	2.09	30,403	Red	Masisea	15,433	0.11	1,340,158	Yellow
Caynarachi	7,591	0.78	90,078	Yellow	Tahuania	14,806	0.21	696,026	Yellow
Polvora	7,252	0.4	174,364	Yellow	Neshuya	12,386	4.49	16,818	Red
Shamboayacu	6,492	2.82	16,992	Red					
Awajun	6,194	1.91	26,544	Red					
Nuevo Progreso	6,111	1.07	51,412	Red					
Uchiza	5,831	1.42	35,789	Red					
Huimbayoc	5,704	0.38	146,166	Yellow					
San Martin	5,393	1.69	26,553	Red					
Saposoa	5,271	1.75	25,119	Red					
Sauce*				Blue					
Soritor*				Blue					

Total	181,713 (74% of forest loss)	0.66	2,591,416		249,310 (93% of forest loss)	1.48	5,867,599
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*Two other districts were included by a special request of San Martin Regional Government.

Figure 4.1.9. Immediate and medium-term threats to remaining forests in the accounting area.



Deforestation and land tenure in the accounting area

In the accounting area during 2008-2017, the loss of forest land was greater in lands with unassigned rights (unassigned lands and non-concessioned permanent production forests - PPFs), accounting for about 47% of forest loss (203,707 ha) (Table 4.1.3, also see maps in Annex 3). Forest losses from the other land tenure categories during the 10-year period ranged from approximately 96,000 ha in timber concessions, 70,000-76,000 ha each in titled private farms and native communities, 28,000 ha in conservation areas, and 1,000 ha for titled campesino communities. Relative annual rates of forest loss during this period, as a percentage of the quantity of forests present in each land tenure category in 2008, decreased in the following order: private farms (3.07%), lands with unassigned rights (1.24%), timber concessions (0.29%), communal lands (0.26% in indigenous communities and 0.16% in campesino communities), and various types of conservation areas (0.07%). Deforestation in lands with unassigned rights, non-concessioned production forests, and timber concessions is often associated with invasions by migrants in association with land speculation (Mejia et al, 2015).

Trends in forest loss were similar in San Martín and Ucayali: in absolute terms, non-assigned forests and timber concessions lost the most forest (75% of the forest loss in San Martín and 58% of the forests lost in Ucayali), followed by indigenous communities and private farms. In both regions, conservation areas lost relatively small amount of forest (11,000 – 17,000 ha) during the 10-year period.

Comparisons between the regions show that in Ucayali absolute losses of forests in indigenous communities and private farms were greater than in San Martín (about 102,000 ha vs. 45,000 ha), but

that losses from unassigned lands, timber concessions, and conservation areas were greater in San Martin than in Ucayali (201,000 ha vs. 168,000 ha).

Table 4.1.3. Deforestation (2008-2017) related to land tenure in the accounting area

Tenure Category	Accounting Area			San Martin			Ucayali		
	Forest Loss (ha)	%	Rel. % annual loss	Forest Loss (ha)	%	Rel. % annual loss	Forest Loss (ha)	%	Rel. % annual loss
Unassigned + Prod. Forests	245,098	47.4	0.92	140,463	56.9	1.12	104,635	38.7	0.64
Private farms	70,461	13.6	3.07	18,286	7.4	2.44	52,175	19.3	3.35
Indigenous communities	76,187	14.7	0.26	26,404	10.7	1.25	49,783	18.4	0.18
Timber concessions	96,034	18.6	0.29	43,762	17.7	0.80	52,272	19.3	0.19
Conservation areas	28,412	5.5	0.07	16,803	6.8	0.12	11,609	4.3	0.05
Campesino communities	1,018	0.2	0.16	1,018	0.4	0.16			
Total	517210	100	1.44	246736	100	0.69	270474	100	0.28

Rates of forest loss in both regions were high on private farms (2.44% in San Martin and 3.35% in Ucayali) and unassigned lands (1.12% in San Martin and 0.64% in Ucayali); the rate of loss of forest from indigenous communities was also high in San Martin (1.25%), but low in Ucayali (0.18%). However, the rates of loss from almost all land tenure categories (the exception is private farms) were much higher in San Martin than in Ucayali. The generally higher rates of forest loss, and the greater absolute loss of forests from public lands in San Martin compared to Ucayali, likely reflect the smaller quantity of forest and greater human population pressure on forests in San Martin compared to Ucayali.

Deforestation in relation to productivity

Econometric analyses suggest that deforestation is inversely associated with greater overall productivity: 1) productivity growth is lower and rates of deforestation are higher in Ucayali compared to San Martin (Table 4.1.4), and 2) calculation of the elasticities of productivity and deforestation (change in production/change in deforestation) are greater in Ucayali, which has more characteristics of the agricultural frontier, than San Martin (Table 4.1.4).

This inverse relationship between productivity and deforestation can be due to various factors: 1) increases in agricultural intensification, 2) increasing use of already deforested areas for agricultural activities, 3) changes in the economy towards activities (e.g. manufacturing or tourism) that are less dependent on deforestation, and 4) reduced access to forests due to increasingly difficult access or greater control of deforestation (through, for example, greater governmental supervision or indirectly through the assignment of rights and land titles). These changes, alone or in combination, can result in less deforestation.

Table 4.1.4. Sectorial growth in San Martin and Ucayali, 2007-2016³⁷

Sectorial Components of Growth	San Martin	Ucayali
Gross regional product (GRP)	6.27 %	3.82 %
Agriculture, livestock, hunting, & forestry	5.73 %	N.R.
Manufacturing, construction, business, lodging and restaurants, other services	6.16 %	4.28 %

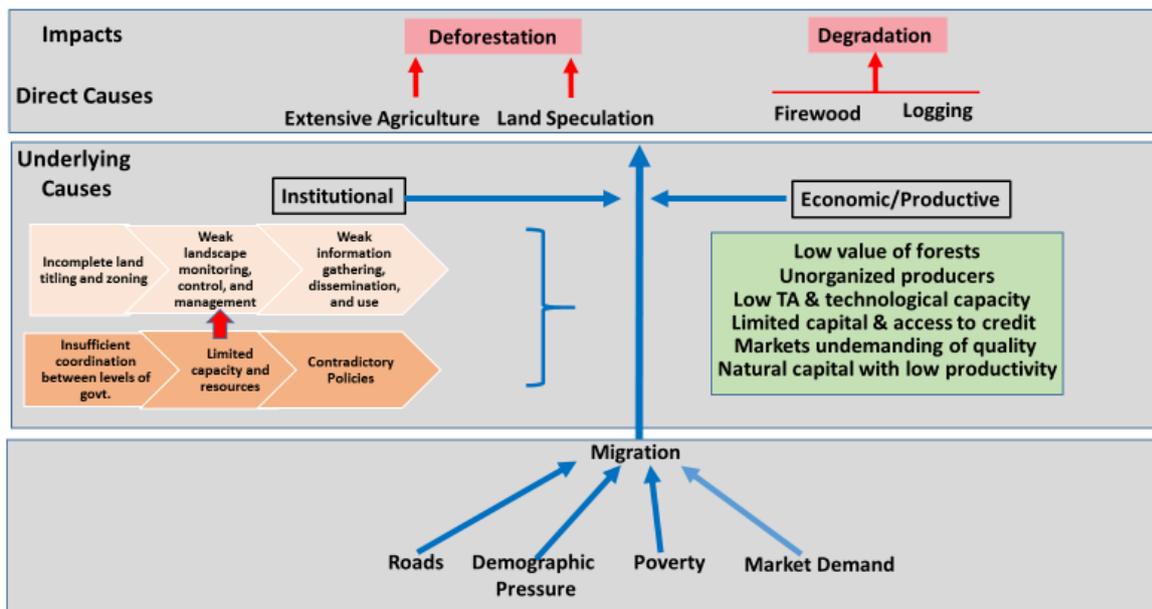
³⁷ The time period is different from that of emissions due to the lack of more recent data.

Tourism ³⁸	10.27 %	8.13 %
Deforestation ³⁹	2.12 %	3.81 %
Elasticity of deforestation in relation to GRP	0.35	0.95

Direct Causes of Deforestation in the Accounting Area

In the accounting area, the direct causes of deforestation are mainly agricultural expansion and land speculation, not livestock raising, mining, or coca production. These direct causes are linked to more fundamental or underlying causes that include low investment associated with low levels or access to capital, little technology use, low levels of producer organization, and few links with attractive markets, and institutional factors such as limited horizontal and vertical coordination, resources, and capacities that in turn affect the assignment of land use and resource rights, the availability of information for decision making and abilities to monitor and control forest and natural resource use (Figure 4.1.10). These direct and indirect causes ultimately play out in a context where forests are pressured by growing human populations (mainly through migration facilitated by roads) responding to market signals and low levels of well-being.

Figure 4.1.10. Causes of deforestation and forest degradation in the accounting area



Within this context, deforestation can be viewed as a multi-purpose “tool” often used to gain rights to land and increase capitalization. Deforestation by under-capitalized farmers and land speculators is a mechanism used to “improve” and exercise dominion over land, as a first step towards obtaining legal possession or title, in selling the land at a profit, or in preparing the land for (legal or illegal) productive purposes, especially agriculture. Prime examples are livestock farmers who cut forest and plant pasture, even though they are unable to stock the land with livestock, or speculators who clear multi-hectare blocks for their posterior sale to incoming migrants or neighboring farmers. Once forests are cut, land

³⁸ Occupancy of hotels and other types of lodging is used as a proxy to estimate growth in the tourism sector (Banco de la Reserva, Peru).

³⁹ Deforestation is based on the increase of non-forest area obtained from the interpretation of satellite images by the Geo Bosques Program of MINAM.

can be sold at a profit, rights of possession or titles can be requested from the government, or crops or livestock can be established.

Agricultural expansion

Analysis of more recent deforestation and changes in land use in the accounting area are generally consistent with Robiglio’s analysis on land use in the Amazon based on the 2012 census. Satellite image-based data for deforestation between 2008 - 2017 and changes in land use during 2005-2016 for the accounting area indicate that the average loss of 51,682 ha of forests annually has been most associated with net increases in agricultural crops (66%), followed by secondary vegetation (18%), pastures (12%), and other uses (3%) (Table 4.1.5).

Table 4.1.5. Average annual changes land use and their contribution to deforestation in San Martin and Ucayali, 2008 – 2017 (in ha). Data in the first two rows are from annual agricultural surveys, that of subsistence agriculture is estimated by difference between estimates from satellite images and surveys, while the rest is based on analysis of satellite imagery.

Land Use	San Martin	Ucayali	Total
Agriculture: coffee, cocoa, oil palm	9,299 (38%)	5,955 (22%)	15,242 (29%)
Agriculture: other crops (principally rice and plantains)	5,663 (23%)	1,522 (7%)	7,185 (14%)
Subsistence agriculture (imputed)	4,047 (16%)	7,079 (26%)	11,137 (22%)
Agriculture, net total	19,009 (77%)*	14,556 (54%)*	33,564 (66%)*
Pastures	692 (3%)	6,174 (23%)	6,866 (12%)
Secondary vegetation	4,474 (18%)	4,938 (18%)	9,412 (18%)
Other uses	544 (2%)	1,294 (5%)	1,838 (3%)
Forest loss	24,719	26,962	51,680

* The two agricultural sub-categories do not sum to the agriculture total due to a variety of factors. See text.

In San Martin, the average annual loss of 24,719 ha of forest is mostly due to net increases in agriculture (77%) and secondary vegetation (18%), with minor net increases (2% - 3% each) in the areas of pasture and other uses. In Ucayali, the average annual forest loss of 26,963 ha is most associated with increases in agriculture (54%); pastures (23%) and secondary vegetation (18%) are second in importance; and increases in other uses (5%) have been minor. It should be noted that although pasture expansion is apparently high in Ucayali, the regional government does not regard increases in pastures as an important cause of deforestation. In Ucayali, the expansion of so-called pastures is often the natural spread of an invasive species (*Imperata brasilensis* Trin.), unsuitable for grazing, into cleared areas or secondary vegetation. This is borne out by an estimated annual production of 0.04 head of cattle/ha. Hence the “pastures” land-use category may be largely degraded, not grazing, land that was originally cleared for agriculture.

Coffee, cocoa, and oil palm in the accounting area

Among agricultural crops, coffee, cocoa, and oil palm have been especially dynamic in recent years and are a major source of agricultural related deforestation in the accounting area, as a result of favorable international prices and promotion of these crops by various coca substitution programs (see Annex 2). The most important crop growing districts and their regional totals are shown in Table 4.1.6 and Annex 4. In both regions, a relatively small number of districts grow the majority of these crops.

Coffee. San Martin is the largest coffee-producing region, by volume, in Peru. San Martin has about 100,000 ha of coffee, where roughly 75% is found between 1,000 and 1,800 masl. It is managed by more than 41,000 producers on an average farm size of 2.3 ha, with an average yield of approximately 980 kg/ha (DRASAM, 2016; 2018). The principal producing areas in 2017 are the provinces of Moyobamba (26,523 ha), Tocache (15,268 ha), Rioja (12,476 ha), Bellavista (12,189 ha), and Lamas (12,038 ha). Yields can reach upwards of 2,500 kilograms per hectare (42, 60-kg bags) on well managed plantations. On less well-managed coffee farms, which represent the majority of coffee farms, yields are around 800 kg/ha (13 60-kg bags) due to poor cultivation practices and limited fertilizer use (Nolte, 2017). In the latter, coffee is managed under a shifting cultivation system – when natural soil fertility declines, farmer abandon their plots and plant coffee on new land cleared from forest. As a result, coffee area has only increased slightly in recent years, even though deforestation related to coffee is significant.

Table 4.1.6. Important agricultural production districts, by crop, in San Martin and Ucayali in 2017

Crops	San Martin districts	Crop area (ha) in districts listed, (crop area in the region)	Ucayali districts	Crop area (ha) in districts, (crop area in the region)
Coffee (> 3000 ha/district)	Moyobamba, Bajo Biavo, Alto Biavo, Alfonso de Alvarado, Jepelacio, Sauce, Polvora, Uchiza	49,482 (98,333)	Raimondi	11,663 (14,644)
Cocoa (> 2500 ha/district))	Campanilla, Huicongo, Juanjui, Pachiza, Pajarillo, Polvora, Nuevo Progreso, Saposoa, Tocache, Uchiza,	37,932 (63,187)	Padre Abad, Raimondi, Campoverde, Curimana	15,433 (29,688)
Oil Palm (> 2500 ha/district))	Barranquita, Polvora, Tocache, Uchiza	32,178 (37,275)	Nuevo Requena, Padre Abad, Campoverde, Irazola	29,087 (36,570)
Rice (> 3000 ha/district))	Awajun, Bajo Biavo, Bellavista, Calzada, Moyobamba, Nueva Cajamarca, Picota, San Fernando, San Hilarion, San Pablo, San Rafael, Soritor, Yuracyacu	77,478 (112,091)	Nueva Requena, Campoverde	7,263 (18,301)
Plantain (> 2000 ha/district))	Moyobamba, Pardo Miguel, Polvora, Tocache, Uchiza	14,510 (45,034)	Nueva Requena, Padre Abad, Curimana, Irazola, Neshuya	19,782 (31,264)

In contrast, in Ucayali, coffee is a relatively minor crop. In 2015, coffee was found on about 12,000 ha, managed by an estimated 5,500 producers on an average farm size of 2.24 ha, with yields of about 800 kg/ha. At present, the majority of Ucayali's 14,000 ha of coffee is grown in the Raimondi district, under conditions similar to those of San Martin.

Cocoa. Cocoa is important in San Martin, since the region is the largest producer at the national level, contributing \$83 million or 46% of the value of total cocoa exports in 2016 (BNR, 2017). In 2015, there were 52,115 ha of cocoa, with an average yield of almost 946 kg/ha (DRASAM, 2016) and around 26,000 farmers. In 2017, the cocoa area was 63,000 ha. Ten districts found in the Tocache (17,931 ha), Mariscal Caceres (14,154 ha), and Huallaga (10,551 ha) provinces in the southern and western portions of the region accounted for the majority of the cocoa in 2017 (DRASAM, 2018) (Table 4.1.6).

Cocoa is also important in Ucayali, which is the fourth most important cocoa region of Peru, after San Martin, Junín, and Cusco, and which accounts for about 8% of national production. The cocoa area has

grown rapidly, from less than 1000 ha in 2000 to almost 30,000 ha in 2017 (DRAM, 2018), but productivity is low, about 600 kg/ha. In 2017. Cocoa is found mainly in 4 districts of Padre Abad (19,567 ha), Coronel Portillo (5,041 ha), and Atalaya (5,054 ha) provinces (DRAM, 2018). Various projects such as the Peru Cacao Alliance, DEVIDA, and the regional government of Ucayali are promoting cocoa.

Cocoa farms are usually found at less than 1000 masl and average about 2 ha in size. Due to the relatively recent establishment of the cocoa crop, many farmers still exploit natural soil fertility to provide relatively high cocoa yields. Currently, less than half of cocoa farmer use any fertilizers (Silva et al. 2015) and productivity can be expected to decrease over time.

Oil Palm. Both San Martin and Ucayali each have about 35,000 ha of oil palm, whose present area (about 74,000 ha) has increased greatly from the approximately 14,000 ha present in 2000. About half of the plantings belong to large companies such as Grupo Palmas, and half to small farmers or their associations. In San Martin, oil palm is concentrated in the provinces of Tocache (30,728 ha in Polvora, Tocache, and Uchiza districts) and Lamas (4,984 ha in Barranquita and Caynarachi districts); in Ucayali, the main provinces are Padre Abad (17,927 ha) (Aguaytia district) and Coronel Portillo (18,643 ha) (Neshuya and Campoverde districts). Farms are generally larger (7-10 ha) than those of coffee or cocoa, but similarly suffer from inadequate input use. Unlike coffee and cocoa, oil palm has not undergone a de-commodification process, although steps have been taken by major actors to align their activities with the RSPO.

Coffee, cocoa, and oil palm and deforestation

Between 2008 and 2017, the average annual increases of cropped areas in the accounting area, based on agricultural survey data, are: 6,666 ha/yr for cocoa, 5,036 ha/yr for coffee, and 3,552 ha/yr for oil palm, but are spatially differentiated between the two regions. In San Martin, average annual increases were 4,138 ha for cocoa, 3,833 ha for coffee, and 1,327 ha for oil palm. In Ucayali, average annual increases were 2,528 ha for cocoa, 2,225 ha for oil palm, and 1,202 ha for coffee. These differences largely reflect the more elevated topography suitable for coffee and a longer history of projects promoting coffee and cocoa in San Martin compared to Ucayali.

Increases in the area under coffee, cocoa and oil palm, measured by surveys, account for about 45% of the expansion of agriculture, and 29% of overall forest loss (Table 4.1.5). However, in the districts with the highest rates of deforestation during 2008 - 2017, the relationship between forest loss and expansion of the area of these crops is variable, ranging from districts where expansion of these crops explains less than 10% of the deforestation (thus suggesting that land speculation or subsistence agriculture is important), to others where crop expansion is greater than deforestation (implying that a portion of new cropping area came from other land uses besides forest, i.e. secondary vegetation) (Table 4.1.7).

Econometric analyses of the relationship between coffee and cocoa expansion and deforestation suggest that the elasticities of deforestation in the accounting area are 0.22 for cocoa and 0.29 for coffee, i.e. a 10% increase in the area of cocoa will result in an 2.2% increase in deforestation, while a 10% increase in the coffee area will result in a 2.9% increase in deforestation. Projections of the areas of these crops based on a business-as-usual scenario suggest that an increase in their combined area is expected and will result in about 24,000 ha of deforestation annually, about double the annual rate of deforestation due to these crops during 2008 -2017.

Table 4.1.7. Net increases in cropped areas (ha) and deforestation (ha) in the districts with highest deforestation, 2008-2017. The most important districts for each crop are marked in color.

San Martin Districts	Coffee	Cocoa	Oil Palm	Rice	Plantain	Corn	Total	District Deforestn.
Moyobamba	9,492	171	0	4,527	999	273	15,462	27,735
Alto Biavo	2,472	1,393	0	1,185	54		5,081	21,311
Huicungo	647	1,831	0	0	188		2,652	16,054
Bajo Biavo	5,627	199	0	15,335	5		21,166	14,972
Alto Saposoa	547	518	0	0	0		1,065	10,877
Barranquita	0	495	2,765	512	282	92	4,146	9,570
Pachiza	518	1,624	0	0	287		2,429	8,728
Campanilla	747	1,939	0	157	257	84	3,184	8,713
Porvenir	0	175	1,563	196	391	21	2,346	7,914
Caynarachi	0	100	1,213	0	0		1,313	7,591
Polvora	2,616	3,337	624	0	2,306		8,883	7,252
Shamboyacu	347	207	0	0	311		865	6,492
Awajun	1,092	0	0	470	369	114	2,045	6,194
Nuevo Progreso	1,969	2,361	1,480	919	439	225	7,393	6,111
Uchiza	2,289	2,481	2,874	995	2,100		10,739	5,831
Huimbayoc	0	249	0	1	364		614	5,704
San Martin	36	322	0		133		491	5,393
Sapasoa	0	4,427	0	55	7		4,489	5,271
Ucayali Districts	Coffee	Cocoa	Oil Palm	Rice	Plantain	Corn	Total	District Deforestn.
Irazola	20	1,552	7,565		1,022	1,719	11,878	34,372
Curimana	125	3,980	1,954	1,383	1,630	275	9,347	33,407
Padre Abad	1,064	4,710	4,175	266	1,421	345	11,981	31,958
Raymondi	11,633	2,390	0		541		14,632	31,168
Nueva Requena	66	1,339	11,129	2,437	115		15,086	24,269
Campoverde	181	4,363	6,218	3,142	1,265	1,209	16,378	18,432
Iparía	67	203	0	0	0	621	891	17,178
Calleria	11	1,157	0	0	0	83	1,251	15,901
Masisea	8	1,049	0				1,057	15,433
Tahuania	28	1,000	0		125	240	1,393	14,806
Neshuya		27		1,039	2,021	385	3,472	12,386

Increases in other commercial crops

During 2008 – 2017, the expansion of other commercial agricultural crops, mainly rice and plantains, is about half of that of coffee, cocoa, and oil palm. In San Martin, these crops, accounted for 30% of the increase in agricultural area and 23% of overall forest loss in the region (Table 4.1.5). Between 2008 and 2017, rice expanded by 3,795 ha/yr and plantains increased by 1,520 ha/yr. In Ucayali, net expansion of other crops, totaled 1,522 ha/yr, accounting for a 10% increase in agricultural area and 7% of forest loss,

under the assumption that all crop expansion comes at the expense of forests. Plantains expanded by 647 ha/yr and rice by 578 ha/yr (DRAU, 2018).

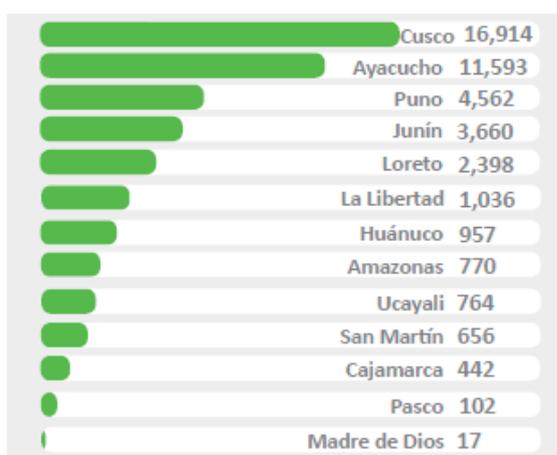
Rice is largely grown under flooded conditions, mainly by capitalized, medium-size farmers working in flat topography. In these systems, production is mechanized and dependent on irrigation and input use. There are reports of medium-size rice producers from San Martin moving to Ucayali in order to be closer to markets. However, rice cultivation (not necessarily mechanized) also occurs along river banks in Ucayali, mainly by new settlers and/or subsistence farmers. Expansion of this crop is a response to growth in national consumption, the growth of unsatisfied domestic demand, high domestic prices compared to international prices, and the reduction of rice production on the Peruvian coast (MINCETUR, 2018).

In contrast, plantains/bananas are grown mainly by migrants as well as more established small farmers, in pure stands or associated with other crops, for self-consumption or sale in local and domestic markets (Cardenas Diaz, 2010). Plantains have been promoted by DEVIDA in San Martin and Ucayali as an alternative crop to coca. Furthermore, demand for the principal variety cultivated in the Amazon has increased due to its use in products such as plantain flour and chips (El Comercio, 2015).

Coca

It should be noted that although relatively large areas (currently around 50,000 ha) are dedicated to coca production in the Peruvian Amazon, the existing coca areas in Ucayali and San Martin cover about 600 – 800 ha/region (see Figure 4.11). Hence, even assuming that all existing coca plantations are eradicated and subsequently replanted annually, coca does not appear to be a major contributor to the expansion of the area under other crops.

Figure 4.11. Coca area (ha) by region, 2016 (UNDCP, 2017)



Land speculation/subsistence agriculture

Data on land speculation are scarce, but both regional governments regard this process as important for deforestation. A map of districts with high levels of deforestation, large amounts of forest (Table 4.1.2) and relatively low levels of commercial crops (Table 4.1.7), suggestive of migratory agriculture and/or land speculation, is shown in Figure 4.1.12. In San Martin, these include the Alto Biavo, Alto Saposoa, Campanilla, Caynarchi, Huicungo, and Huimbayoc districts. In Ucayali, they include the Iparía, Calleria, Masisea, Tahuania, Padre Abad, and Raymondi districts that are accessible by highway or found along

the Ucayali River. According to regional government personnel, these districts have large numbers of migrants.

In Table 4.1.5, the sum of the increases of the two agricultural sub-categories (coffee, cocoa, and oil palm + other crops) based on agricultural surveys does not equal the quantity of forests converted to agricultural use estimated via the interpretation of satellite imagery. This suggests that the difference in agricultural area estimated by the two methods is largely due to land speculation and/or subsistence agriculture on the agricultural frontier, since these lands are not apt to be included in agricultural surveys, but will be classified as agriculture in satellite images. Based on this estimation,

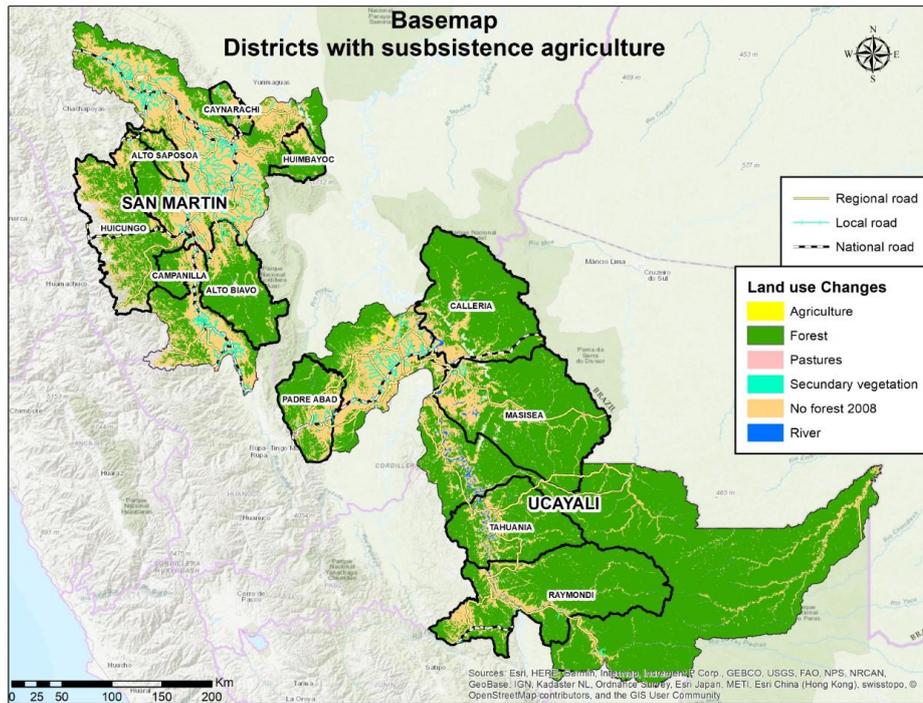
subsistence agriculture/land speculation may be responsible for about 20% - 25% of deforestation and is greater in Ucayali (26%) than in San Martin (16%), consistent with the larger amount of agricultural frontier in the former. (Other possible causes of these differences in agricultural area are surveys' underestimation of deforestation when unproductive plots are replaced by newly cleared and planted areas, or overestimation of agricultural area based on satellite imagery due to mis-categorization of cropped area, i.e. mixtures of crops and secondary vegetation in early stages of plot abandonment or non-productive areas cleared for land speculation may be classified as "agriculture". These errors are estimated to largely cancel each other out).

Land speculation occurs hand-in-hand with migrations and is a frequent cause of land invasions. Invasions occur generally in non-concessioned permanent production forests, forestry concessions, or lands without assigned rights. In these areas, the invaders cut the forest, in part incentivized by the idea of demonstrating possession of the land. Once established, the lands can be commercialized, based on formal possession, false titles, or legal titles, to recent migrants or landless farmers.

Figure 4.1.12. Districts (labelled) with a high suspected presence of migratory agriculture and/or land speculation.

Invasions and forestry concessions in Padre Abad, Ucayali

The forestry concessions of Padre Abad have highway access and are accordingly threatened by invasions, principally by people searching for land to settle or to plant coca. This phenomenon has proven difficult for authorities or local rights holders to control due to land trafficking. Settlers within the concessions maintain that they have legal permits issued by land speculators, but according to the Ministry of Agriculture, no type of land permit or title has been emitted in forestry concessions (Mejia et al., 2016).



The emerging vision, then, is that coffee, cocoa, and oil palm together likely contribute about 60% of agricultural expansion and about 30% of deforestation in the accounting area. Other commercial crops contribute about 15% to deforestation; secondary vegetation, which is a bi-product of agriculture or land speculation, accounts for about 18%; (mostly unproductive) pasture or pasture-like vegetation accounts for about 12%; other uses are responsible for less than 3% - 5% of deforestation; and land speculation or frontier agriculture is responsible for about 20% - 25% of deforestation.

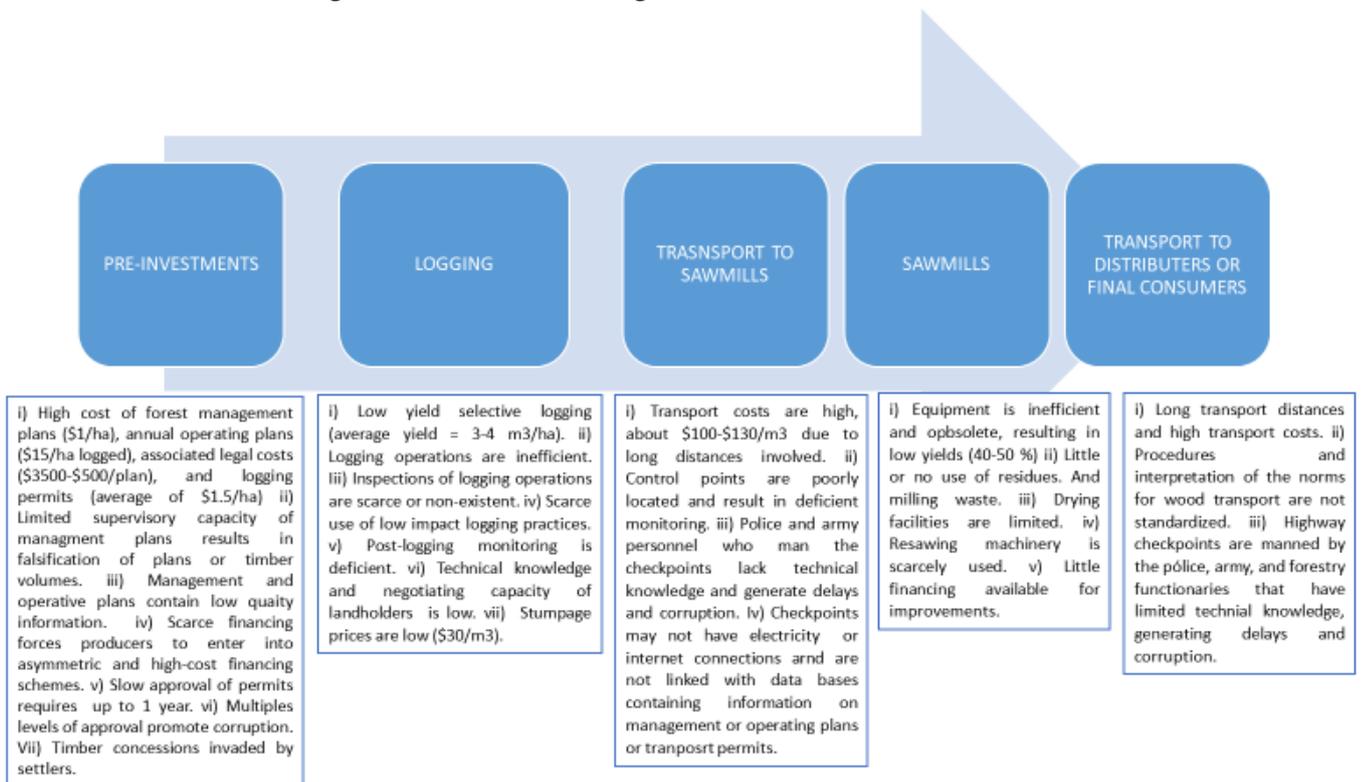
At a more detailed level, Tables 4.1.6 and 4.1.7 also suggest that: 1) a relatively small number of districts are involved in deforestation (26 of 96 districts); 2) some districts (Moyobamba, Nuevo Progress, Polvora, Uchiza, Campoverde, Curimana, Irazola, and Padre Abad) are dynamically diverse, with large areas of expansion of 3 or 4 crops; 3) other districts suffer from deforestation, but with minimal increases in the area of commercial crops (examples are Alto Biavo, Huicungo, Alto Saposoa, Caynarachi, Shamboyacu, Huimbayoc, and San Martín in San Martín, and Iparía, Calleria, Masisea, Tahuania, and to a lesser degree, Padre Abad and Raymondi districts in Ucayali). The districts in the latter category have significant agricultural frontier areas where land speculation and subsistence agriculture are likely to be more common.

Forestry and Logging

Most activities within forests cause forest degradation, not deforestation, but it is the low value of forest land that indirectly provides incentives for forest conversion to other uses. Forests produce about \$100 - \$300/ha annually (Ickwitz et al. 2017), compared with opportunity costs of \$600 to more than \$3000/ha for land-based activities in Ucayali and San Martín (SERNAMP, 2009).

In both regions, the problems with logging and illegal wood production are associated with a host of factors that cause the low competitiveness of sustainable forest management compared to other forms of land use, especially by small farmers or loggers (Figure 4.1.13):

Figure 1.13. Problems along the wood value chain



These problems include:

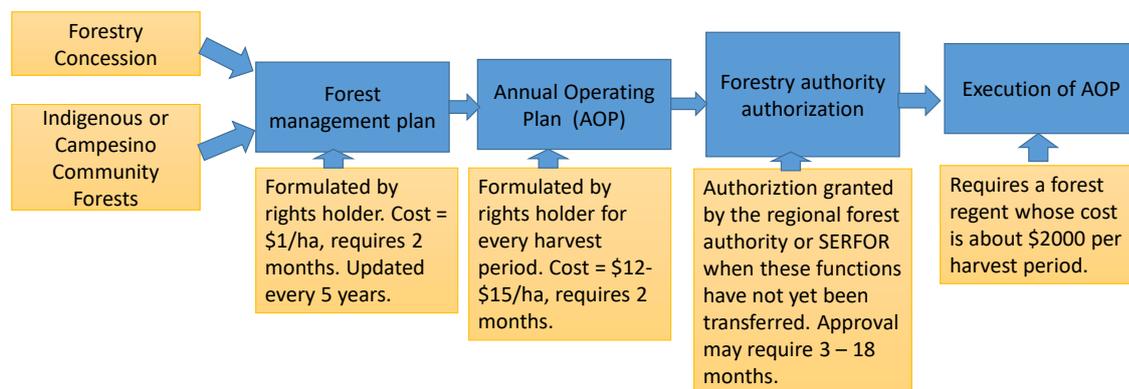
- High costs (\$77/m³ for large loggers and \$179/m³ for small loggers) and inefficiencies of logging, due to the lack or obsolescence of machinery and equipment and the use of only a few commercial timber species (only five species make up most of the volume of the twenty-one existing species commercialized), result in low volumes (3 – 6 m³/ha) of timber extraction and high costs per hectare (Mejia et al., 2017).
- High costs of regulatory compliance (see Figure 4.1.14). These costs are avoided by logging illegally, but potential savings are partially offset by the need to pay bribes (approximately \$6,517 per operation for medium-sized loggers and \$247 per operation for small loggers).
- Slow bureaucratic processes related to approvals and permits. Approval processes can require various months and can extend past the period of harvest (Figure 4.1.14).
- Lack of financial mechanisms that are appropriate to the needs, seasonality, and time frames of the forest sector. Credit for small and medium-sized loggers is difficult due to lack of formalization and guarantees. Therefore, these producers resort to shadow banking alternatives such as “habilitation”, which represents advance payments on the future delivery of timber, or pawn shops or currency brokers

where interest rates may vary from less than 1% to 10% per day (Sears and Pinedo Vasquez, 2011⁴⁰; Mejia et al, 2017 obsit).

- High transportation costs (about \$70-\$130/m³) due to the inferior state of road infrastructure and the long distances involved.

- Unfair competition from illegal loggers in the concessions, communal territories and areas with unassigned rights. It is estimated that 40% - 62% of wood produced, including almost all of the wood produced by small loggers or farmers, is illegal (Mejia et al., 2015 obsit; Apoyo Consultoría, 2018). Illegal wood avoids regulatory costs associated with forestry management plans and regulatory fees, but may entail the payment of bribes.

Figure 4.1.14. Flow diagram and costs of forestry permits



In the case of community forestry, additions to this list include inadequate capitalization, organization, and technical or commercial knowledge that restrict the ability of communities to harvest their own wood or to enter into commercial alliances with loggers or buyers.

Furthermore, small loggers (farm owners or actors specializing in forest extraction) face serious restrictions not encountered by larger operators. Small loggers, who account for 40% of the number of loggers, but 2% of the volume of wood produced, are almost entirely informal due to their inability to comply with the requirements of management instruments such as concessions, permits, and authorizations which require capital and resources (Mejia et al., 2015 obsit). They are thus excluded from sustainable forest management, are forced to work informally, and are generally more exposed to extortion on the part of the system of timber enforcement and control than medium or large loggers.

In addition, in San Martin active forestry concessions as well as non-concessioned productive forests or forest lands with unassigned rights, have serious problems with forest loss due to invasions. These invasions and associated social conflicts are facilitated by the construction of illegal roads and the lack of land use control. This situation is aggravated by the low regional government budget and insufficient personnel available for the management of natural resources, an incomplete process of decentralization

⁴⁰ Sears, R. R., y Pinedo-Vasquez, M. (2011). *Forest Policy Reform and the Organization of Logging in Peruvian Amazonia*. Oxford: International Institute of Social Studies.

that lacks a clear definition of functions and competencies, and the delays in the initiation of operations of the new environmental, forestry, and agrarian institutions.

Forest Degradation in the Accounting Area

Data related to forest degradation are scarce. Degradation may be due to logging, firewood and charcoal harvests, or forest fires. The magnitude of degradation was estimated via indirect methods or proxies, as explained below.

Estimates of illegal timber production at the national level suggest that it contributes 40% - 65% of total timber production, as noted in the sub-section on Logging above, equivalent to 1.0 – 1.4 M m³/yr or 1.1 – 1,500,000 tCO₂e/yr⁴¹. Since Ucayali contributes about 19% to national wood production⁴², illegal logging is estimated to contribute a similar percentage, about 220,000 – 300,000 tCO₂e/yr. On the other hand, San Martin is estimated to contribute about 1% to national annual wood production, suggesting that illegal logging is equivalent to about 10,000-15,000 tCO₂e/yr. If illegal logging contributes to 50% of total timber production, this would suggest that the total annual emissions due to legal and illegal logging from San Martin and Ucayali are about 400,000 - 600,000 tCO₂e/yr.

Firewood and charcoal harvests and forest fires are regarded as relatively unimportant by personnel from the San Martin and Ucayali regional governments. According to the National Household Survey of INEI⁴³, the percentage of households using firewood decreased greatly between 2006 and 2016, ranging from 5% in Ucayali, which has a more urban population, to 10% in San Martin for the latter year. The use of firewood, in particular, has decreased due to the use of alternative sources of fuel by brick factories, the introduction of more efficient stoves, and increases in the domestic use of natural gas.

The following indirect estimates suggest that firewood and charcoal contributions to emissions are about a half of those due to logging mentioned above. According to statistics from SERFOR (2015), firewood and charcoal production in 2015 was approximately 200,000 tons in San Martin and 83,000 tons in Ucayali, equivalent to approximately 230,000 tCO₂e/yr⁴⁴.

In contrast, the estimation of forest degradation based on proxies (which estimates annual forest degradation associated with new non-forest areas in a buffer zone extending from the non-forest boundary into the forest – see Section 8) suggests that emissions resulting from forest degradation are about 28.6% of total forest-based emissions, equivalent to an average of 9,846,000 tCO₂e/yr for the accounting area. Clearly, the large (factor of 10) differences among these estimates of degradation and the fact that the majority of degradation occurs along the edges of the forest - non-forest interface or in small perforations within forests, suggests that partial forest clearing for agricultural may be even more important than degradation caused by logging and firewood harvests. Clearly, more precise and direct estimation methods are needed and are being developed.

⁴¹ Assuming a biomass density of 0.65 t/m³, a carbon: biomass ratio of 0.45, and a stoichiometric of 3.67 to convert C to CO₂e.

⁴² In Ucayali, 60 businesses (not all legally registered in Ucayali) are involved in exports, but four, Consorcio Maderero, Inversiones Técnicas Maderables, JR Muye Investment, account for 40% of the sector's total production and exports (GOREU, 2017). In 2012, 20 buyers concentrated 22% of the demand, while 2066 buyers made up the remaining 78% (Mejia et al., 2015).

⁴³ Instituto Nacional de Estadística e Informática - Encuesta Nacional de Hogares (2017).

⁴⁴ Based on a distribution of 80% firewood: 20% charcoal, densities of 0.2 t/m³ for charcoal and 0.6 t/m³ for firewood, a carbon: biomass ratio of 0.45 and a C: CO₂ conversion of 3.67.

Underlying or Indirect Causes

Indirect or underlying causes of deforestation are many. They correspond to structural factors that usually act in concert, but at large scales, favoring deforestation and reducing the ability to respond to land use pressure.

In the Peruvian Amazon, the broad array of underlying causes of deforestation can be classified into the following groups:

Macro socioeconomic factors connected primarily with population growth, poverty and migration, both within and outside the Amazon, as well as market demand at the national or international level.

Productive factors tied to deforestation and extensive land use, including the low profitability of forest activities compared to agriculture; low input and technology use, hence productivity, caused by limited technical assistance, scarce capital, and limited access to credit; low levels of farmer organizations; and limited direct market access and a dependence on agricultural commodity markets undemanding of quality.

Institutional factors, such as limited institutional capacity and financial resources that underlie: inadequate vertical and horizontal coordination of public policies; imperfect and incomplete allocation of rights to forest lands, land titling and zoning; the limited availability, dissemination, and use of information for decision making and land use planning; and the low level of monitoring, control, and enforcement of land and natural resource use.

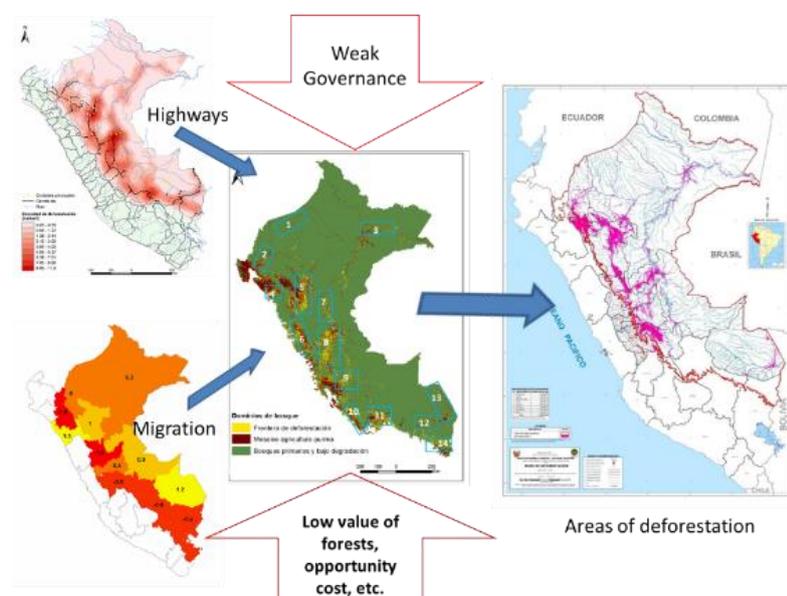
These conditions work together to cause deforestation. In effect, population growth, poverty, and favorable agricultural demand and prices stimulate migration, facilitated by roads, to forested regions. In these regions, high production costs, difficult logistics, and limitations of markets related to forest products reduce the value of forest land and favors their conversion to other land uses. Resource limitation of land holders or recent migrants results in land speculation based on deforestation or the use of land-extensive farming systems that cyclically substitute forests for inputs to produce low yields and products acceptable in relatively low-priced local markets undemanding of quality. At the same time, institutions short on resources and capacities are unable to control these processes due to incomplete land titling and zoning, information shortages for planning, decision making, and managing land and natural resources, and shortcomings related to their monitoring and control (Figure 4.1.15).

Macro socioeconomic factors

At the macro level, population growth, poverty, the availability of relatively cheap land in the Amazon, and the increase of road connections within the Amazon and to the Pacific coast pressure forest conversion to extensive agriculture or land speculation.

Population growth and migration. Populations in the accounting area growing 1.5% annually in both regions (INEI, 2018 obsit). Moreover, both regions are among the five regions of Peru with greatest net immigration, where Ucayali ranks 5th and San Martin 6th, based on a net immigration of 69,000 - 75,000 in 2015 (OIM, 2017 obsit) (see also section 3.1).

Figure 4.1.15. Factors driving deforestation



In 2015, immigrants comprised about 8% of the population in San Martín and originate mainly from Cajamarca (45%) and neighboring Amazonas (14%) which are among the poorest regions of Peru (section 3.1). These immigrants comprise 35% of the economically active population of San Martín and 57% work in the agricultural/forestry sector, where they make up 45% of the economically active population of the sector (OIM, 2017 obsit).

In Ucayali, immigrants made up about 9% of the region’s population in 2015; 30% of the immigrants originate from Loreto, 25% from Huánuco, 13% from San Martín, and 7% from Lima and are generally poor. They comprise about 42% of the economically active population of the region and about 25% work in the agricultural/forestry sector, where they comprise about 45% of the economically active population of the sector (OIM, 2017 obsit) (section 3.1).

Roads. The incorporation of large numbers of immigrants in the agricultural/forestry sector and their access to forests have been facilitated by large road construction projects: the IIRSA Norte, from the Pacific coast to San Martín, the Marginal highway, which connects San Martín and Ucayali and Huánuco, and the much older Federico Basadre highway which connects the capital of Ucayali, Pucallpa, with Lima. Road improvements also facilitate access to forests.

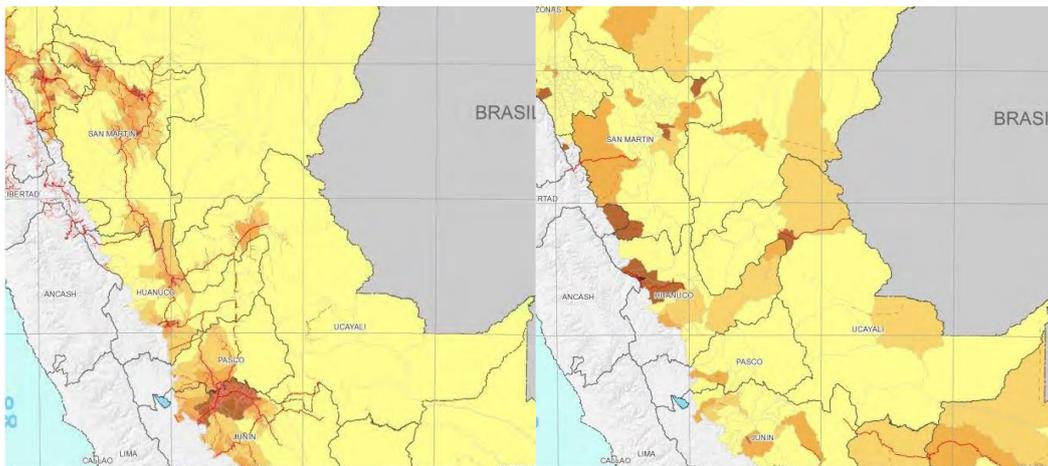
San Martín is among the regional leaders in road connectivity and improved (asphalted) 40% of the regional road system during 2015–2018, with the result that 56% of the 1136 km of major roads within the region are presently asphalted (DRTC, 2018). In addition, more than 3,000 km of (mainly unpaved) roads exist at the municipal or local levels. New roads are projected for the northeastern corner and the western sector of the region (Figure 4.1.16).

Figure 4.1.16. Actual and projected density (km/km²) of new roads in San Martín and Ucayali (MTC, 2013 in Guisa, et al., 2014⁴⁵)

⁴⁵ Guisa M and Calderon A (2014) Memoria descriptiva del mapa de áreas prioritarias con potencial de implementación del esquema REDD+. MINAM.

Actual

Projected



In Ucayali, deforestation has expanded along the western portion of the Federico Basadre highway in the region. Moreover, the road between Atalaya and Puerto Ocopa, Junín has linked to the national highway network and has opened up that area of the region to newly arrived immigrants as well as attracting legal or illegal forest extraction activities. Ucayali has 1,704 km of departmental roads, and another 1,386 km of secondary roads (*caminos vecinales*), of which 42% are compacted (DRTC, 2017). Furthermore, projected increases of roads in the northeastern sector of Ucayali will link that part of the region with the trans-Amazon fluvial network and will attract settlers and a corresponding increase in forest pressure (Figure 4.16).

Greater inter-institutional coordination and the avoidance, mitigation, or compensation of environmental impacts of roads will be needed in order to potentiate the positive economic impact of these projects while minimizing those on forests.

Market Demand. Markets and prices for coffee, cocoa, oil palm, rice, and plantains have been generally favorable during the last 10 years and have provided a stimulus for forest conversion. These crop products are largely commoditized, i.e. they tend to concentrate on non-differentiated products that are compensated based on standard international prices, of which farmers receive a small fraction, although there is a trend towards de-commoditization of coffee and cocoa, mentioned in more detail below and in Annex 2.

The De-Commodification of Coffee in Peru (World Bank, 2017)

Peru is the world's second leading exporter of organic coffee, and it is increasing its participation in this specialty market. The shift from the conventional to the organic and differentiated coffee market did not result from a deliberate national strategy to shift farmers from high-input production systems to organic production; rather, it emerged to take advantage of the fact that most producers used low levels of chemical fertilizers and pesticides because they could not afford them.

Rise of the specialty coffee industry

Since the late 1990s, NGOs, international agencies, and government entities have encouraged the industry to align itself with the growing global demand for organic and specialty coffee. Many of these efforts have focused on improving the competitiveness of small-scale coffee producers by improving the early stages of coffee processing (harvesting, milling, drying, sorting), pursuing collective action at the level of aggregation, and achieving organic

and other certifications (Fair Trade, Rainforest Alliance). Associated marketing campaigns and investments in infrastructure to assess quality (cupping capabilities, for instance) helped to increase domestic consumption and draw international attention to the new quality attributes of Peruvian coffee.

The shift in market orientation brought better export prices, community empowerment, and other benefits to small-scale producers, but coffee is still a risky business, characterized by volatile pricing, climatic, disease, and pest conditions (e.g. the recent outbreak of coffee rust disease that has affected 40–60% of plantations nationwide). The premium paid for organic and specialty coffee has not been enough to compensate for lost productivity. Organic producers have been particularly vulnerable, because their use of fungicides to suppress the disease is restricted.

Recalibrating the value chain

Initiatives to increase Peru's participation in the quality-differentiated market for coffee have widened opportunities for thousands of farmers, and quality improvements have helped to buffer the low prices and other shocks that inevitably affect the industry. At this juncture, the competitiveness of this critical value chain will depend on striking a better balance between improvements on and off farm, to strengthen the capacity of all participants in the value chain to respond in concert to a broad set of competitiveness challenges, from production to marketing.

Coffee and cocoa do not yet form an important part of the mainstream sustainable commodities movement driven by large multi-national businesses or commercial fora such as Unilever, the Consumer Goods Forum, or the Roundtable on Sustainable Palm Oil (RSPO), although certification (Rain Forest, UTZ) and commercial demand for sustainable coffee and cocoa is increasing (e.g. Nestle). Markets for coffee sourced from Peru continue to emphasize bulk purchases of standard or improved quality (based on sourcing from zones known for their coffee quality). A similar situation exists for cocoa, although markets are more segmented into different, quality-related categories (Scott et al., 2015 obsit).

The De-Commodification of Cocoa in Peru (World Bank, 2017)

For cocoa exports, like coffee exports, market differentiation proved to be a valuable strategy. After decades of stagnation, in the early 2000s the area planted to cocoa in Peru started to rise steadily and then dramatically—increasing from 50,000 ha in 2005 to 121,000 ha in 2015. Interest in cocoa was fomented by development projects launched to replace coca. The projects took the form of public-private alliances that brought together Peruvian public institutions, international buyers, and producers (e.g. the Peru Cocoa Alliance, funded by USAID). Although some of the partnerships with large international buyers never materialized, the projects provided an essential platform for innovation and coordination in the value chain.

Entry into market for conventional cocoa

Initially the highly productive and disease-resistant cocoa hybrid variety CCN51 was promoted and planted on a large area, but it proved to have a significant disadvantage: the quality of the bean is unexceptional, forcing Peru to compete in the market for conventional cocoa. Dominated by large West African players, the market is highly competitive and extremely price sensitive. Profit margins are tiny and highly vulnerable to price fluctuations. Currently cocoa prices are experiencing a significant decline owing to global overproduction.

Efforts to enter organic cocoa and other differentiated markets

Peru's cocoa industry managed to move away from the conventional cocoa market by pursuing organic certification. Although a small player in terms of overall cocoa production, Peru is the world's second-largest producer of organic cocoa. The industry has recently scaled up efforts to break into the "fine/flavor" cocoa market by promoting the unique qualities of Peru's indigenous cocoa varieties. Compliance with certification and traceability requirements is costly, but essentially mandatory, given that most large international chocolate manufacturers are committed to achieving 100% certification of their supply. Producer organizations in Peru will need to seek technical assistance to improve productivity, focus on consolidation to achieve economies of scale

and gain market power, strengthen their links to international markets, and develop their links with local buyers in the national market.

Similarly, domestic markets for rice and plantains have also been growing and have been implicated in deforestation. The problem with these markets is that they do not recognize product sustainability, but rather operate mostly on the basis of price, and secondarily on quality.

Certified or specialty markets for these products are relatively small (see Annex 2). Although, certification systems usually include criteria for sustainability, but not quality, specialty markets tend to value quality over sustainability. Market niches for reduced-deforestation, high quality coffee and cocoa that command higher prices are growing, but are still small and of difficult access. They are generally dominated by international, rather than national, buyers (e.g. OLAM, ECOM, but see PERHUSA, the SCAN Peru Platform and the JNC for local promotion). Further market details are presented in Annex 2.

Early experiences with de-commoditization of coffee and cocoa are promising and lessons learned can be applied (see boxes above). These lessons suggest that key factors for developing these markets include: 1) the recognition of an existing or potential market opportunity and changes in supply, based on collective action, improvements in quality, and marketing, to meet the new demand; 2) complementary efforts by multiple actors, including producer organizations, agribusiness firms, public agencies, NGOs, and international development agencies, whether closely coordinated or acting in parallel; 3) strategic direction by a lead entity or entities for others to follow in pursuit of a shared goal; and 4) a strong commitment, persistence, and buy-in to a long-term vision (World Bank, 2017). In the current context of San Martin and Ucayali, this suggests that greater emphasis is needed on producer organization, the formation of a multi-stakeholder platform for promotion and oversight, the establishment of quality standards (such as those envisaged in the San Martin and Ucayali branding), and long-term leadership.

Productive Conditions

Productive enabling conditions refer to productive services or factors used by individuals or producer organizations in order to produce profitably, competitively, and sustainably. Principal limitations associated with these enabling conditions include access to capital and credit, information and technical assistance, and markets, as well as the aggregation of producers into organizations that would help reduce transaction costs and achieve economies of scale. As such, these limitations apply to small actors working within forests (small landholders and loggers that extract timber), as well as those outside of forests dedicated to farming.

Table 4.1.8. Problems related to technical assistance and producer organizations in the Amazon

Technical Assistance	Organization of Producers
Lack of overall strategies or policies, although specific programs exist	Lack of overall strategies or policies, although specific programs exist
Service providers are diverse, dispersed, and non-articulated. Approaches and methodologies may differ among providers	Service providers are few and non-articulated. Approaches and methodologies may differ.
Lack of segmentation of producers or recognition of their technical level or needs	

Incomplete geographic coverage; assistance may not coincide with timing of needs	Incomplete geographic coverage; assistance may not coincide with timing of needs
Non-actualized technical content, technical content not aligned with market or commercial needs, or does not include economic impact of technical recommendations	Assistance may not align with market or commercial needs
Lack of incorporation of emissions reductions or climate change adaptation in technical content of assistance programs	Lack of incorporation of sustainability and quality criteria in marketing strategies

The relative lack of technical assistance and producer organizations have been commented on in the sections above and in Annex 2. Further details are presented in Table 4.1.8 below. The problems of technical assistance, producer organizations, and markets reinforce each other, since the lack of organization increases the cost of technical assistance, technologies, and inputs and negatively affects the ability of farmers to obtain leverage in their negotiations with markets or in exploiting new market opportunities. Likewise, the lack of technical assistance also affects the ability of producers to access markets based on quality.

Access to credit is necessary in order to increase productivity via the incorporation of improved technologies or inputs into productive systems. At present, credit access and use in the Peruvian Amazon is very low, since 11.7% of the farmers in the region obtained credit while 10.2% solicited credit, but were denied. Currently only approximately 20% of medium-sized farmers and 10% of small-sized farmers in the Amazon have credits from Agrobanco or other financial institutions. Furthermore, the majority of credit is used for commercialization, not production, and 56% of Amazonian farmers identify the scarcity of credit as a principal factor limiting agricultural production. In addition, associated financial products such as crop insurance and farmer pension systems are largely absent.

In the Amazon region, Agrobanco (presently under reorganization) was the principal credit institution in the region, and 67% of its local credit portfolio was dedicated to small-scale farmers, with an average loan size of US\$6,500 per farmer. Agrobanco offered 16 agricultural/forestry loan products with annual interest rates in the range of 15% - 23% (for borrowing in Peruvian Soles and 10% - 14% in US dollars) depending on the term and size of the loan, although there are also significant “hidden costs” in terms of the time and expenses that borrowers incur in obtaining these loans. Credit policies of Agrobanco’s successor are unknown at present. In the Amazon regions of San Martín and Ucayali, the principal municipal savings and loans organizations are Caja Maynas, Caja Paita and Caja Piura. Their annual rates of interest for agricultural loans range between 25% and 125%.

Credit Recipients (INEI, 2012)

Credit recipients are most often men between 45 and 65 years old and Spanish speakers (as opposed to speakers of native languages). Credit access increases with education level, number of family members, farm size, proximity to the district capital, and lack of participation in other social welfare programs. Moreover, 48.3% of credit recipients have other jobs and 23% belong to a farmer association. Women who read and write are more likely to receive credit than those that don’t, and access to credit tends to increase with educational level.

Besides the low availability and high interest rates of credit, other barriers include: the lack of land title, other “hard” collateral or guarantees, high transaction costs, and lack of familiarity of lending institutions with agriculture or logging and consequently the perception of high risk in lending to small producers on the part of lenders.

The consequence of this situation is that farmers without credit are unable to access inputs or technologies and suffer low productivity and product quality as a result. On the other hand, small loggers are forced to access capital via habilitation (advance payments for future delivery of timber) or shadow banking based on very high interest rates, thus setting off a vicious cycle in which logging is used for rapid profit at the expense of forest degradation or improvement in forest quality or transformation practices (Mejia et al., 2015 obsit).

Institutional Enabling Conditions

In general, deforestation is facilitated weak forest governance and the scarce presence of the State in the region and is caused by a complex of interacting conditions:

Insufficient institutional cooperation among sectors and among different levels of government. Sectorial approaches and the lack of coordination between national, regional, and local governments are the norm, and make solving problems that are multi-sectorial and multi-level in nature difficult. Moreover, they result in deficient information flow, decision making, and overlap or gaps in policies and actions.

Coordination of MINAM and MINAGRI has historically been limited to forestry themes involving the Forestry and Wildlife Service (SERFOR) of MINAGRI and the PNBC of MINAM but it has improved in the recent years. Other dependencies of the Ministry of Agriculture have been neglected, in spite of the more significant roles that they have in the implementation of the forest and climate change strategy. At a minimum, better cooperation among MINAM, MINAGRI, PRODUCE, and the regional governments is needed to promote production and better control and monitor land use. In the forestry sector, coordination between the regional and local governments, OSINFOR, SERFOR, MINAM, and the PCM is needed, and SINAFOR, the coordination body for forestry needs, to be empowered. Currently, actions are underway in order to improve high level cooperation among sector.

Coordination of the support provided by different agencies of external cooperation for REDD+ is also needed. The government has made a great effort to align the activities of numerous projects financed by international cooperation in order to avoid duplication and ensure complementarity, but there is still significant room for improvement.

Policies that favor deforestation. A number of laws related to land, agriculture, and forestry contribute to deforestation via the creation of perverse incentives or the lack of enforcement. Although the Regulation for Forest Management (Supreme Decree 018-2015) prohibits the granting of titles for lands whose greatest use capacity is forestry or protection, in practice, the actual use permitted on these land has often been determined on a case-by-case basis, based on inadequate maps of land use classification and the absence or incomplete zoning. At the regional level, governments often authorize the conversion of forests to other uses and provide public services to settlers in forests, in contradiction with the express use of these lands for forest products, services, or conservation.

Faced with this situation, the new Forestry Law 29763 tries to restrict the possibilities of converting lands whose greatest use is forestry or protection to agriculture. Under this law, the granting of land rights and the authorization of changes in land use require that the landholder demonstrate *a priori* that the highest capacity of use is agriculture or livestock, a determination that must also be backed by the no objection of the forestry authority and MINAM before the authorization of deforestation is granted. However, within the forestry sector fiscal incentives, such as tax reductions for forestry activities, and legal requirements, administrative procedures, and management instruments required under the new

Forestry and Wildlife Law generally favor medium and large loggers. Application of these procedures by small landholders or loggers is uneconomic, thus forcing them to work informally, excluding them from sustainable forest management, and exposing them to extortion on the part of authorities.

In general, the design of public policies that affect deforestation need to include those actors, via appropriate participation mechanisms, that are linked to the causes of deforestation, especially that due to the agricultural sector.

Incomplete assignment of land and resource rights, as well as land use classification and zoning. As mentioned above, high rates of deforestation are associated with the large portion of forests in the Amazon that do not have assigned rights (non-concessioned production forests or forests with unassigned rights). Furthermore, the reclassification of timber concessions is necessary, due to invasions, but this process is incomplete.

Despite advances in land titling in recent years, needs related to land or forestry classification, zoning, and titling still exist. This situation is a product of problems related to other enabling conditions: limited cooperation among responsible institutions, the lack of information flow among government entities and the general population, inadequate monitoring and control of land use, and the cost associated with traditional zoning and land titling procedures. It results in considerable losses of forest lands due to invasions, inadequate land use, as well as social conflicts among land holders and the apparent illegality of many settlers. Incomplete forest zoning also affects the development and implementation of procedures or protocols for the (re)assignment of forestry concessions by the regional governments.

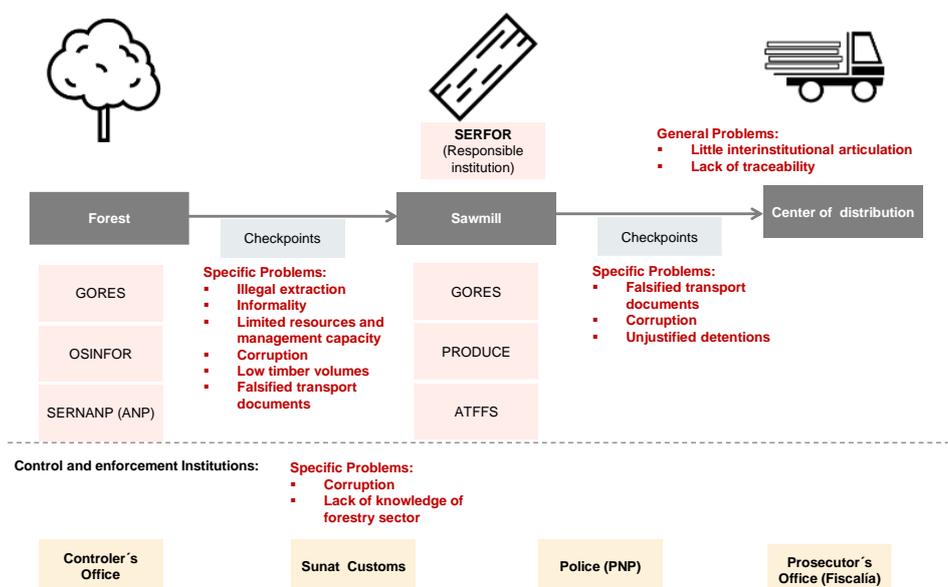
A partial solution to the number of small producers that lack land titles or other instruments of formalization that can serve as credit guarantees, is the granting of cession of use contracts to farmers without title which enable the legal practice of agroforestry on forest lands. These contracts require compliance with a number of conditions (such as conservation or renovation of forests and payment of an annual fee), and produce a number benefits such as providing a legal basis for subsequent sale of these lands or trees found on them or priority access to government services (see the following link for further details: <http://www.worldagroforestry.org/project/support-development-agroforestry-concessions-peru>).

Weak monitoring, management, control, and sanctioning of land and natural resource use. Although the GeoBosques system developed by MINAM is an effective satellite-image-based tool for monitoring deforestation in almost real time, enforcement of laws or regulations and sanctioning of those responsible is almost non-existent. Various weaknesses also exist with the system for the monitoring, control, and sanctions in relation to forest timber concessions or other land uses. Specific problems with the monitoring and control of timber concessions include: the uncertainties related to procedures, costs, and effectiveness of forest regents; the system of timber control includes a variety of institutional actors (Figure 4.1.18) and is based on easily falsified plans, permits, and shipping documents that can be obtained in the black market; as a result, checkpoints for the control of timber are affected by the corruption of police and supervisory authorities. Mejia et al (2015) mention that the transport of logs to sawmills in Pucallpa and sawn boards to Lima can occasion the payment of bribes of more than \$1000/shipment.

There is a chronic lack of access to, dissemination, and use of high quality information on which to plan, make land and natural resource management decisions, coordinate institutions, increase public

consciousness, or change attitudes. The coordination of information also affects timber control, since the system of permits and transport is not linked with control check points, nor is there a platform for traceability. Furthermore, information on both agricultural and forestry production and markets is deficient. At a more general level, the educational level and environmental knowledge of the general public, especially migrants, is low, which leaves them unprepared to sustainably manage forests or agriculture under Amazonian conditions.

Figure 4.1.18. Institutional involvement in timber value chains (Apoyo Consultoría, 2017).



Low and inadequate budgets and institutional capacities exist at all levels, but perhaps most critically at the regional level, since the regions are responsible for much of the planning, implementation, and monitoring of land and natural resources, but have received limited funds for the central government for carrying out these responsibilities. The recently created Regional Environmental Authorities (ARA) responsible for natural resources require greater support to consolidate their institutionality as do all government entities related with the classification, zoning, and titling of lands with unassigned rights and with the administration of the forest supervision and control system (Mejia et al, 2015). Moreover, the coordinating Forest and Wildlife Management Committees contemplated in the Forestry and Wildlife Law are under-funded which limits the participation of forestry stakeholders and civil society in general in confronting the illegal occupation of land and other practices that result in deforestation.

In effect, weak institutions and governance are unable to cope with population pressure driven by poverty, favorable export-oriented agriculture markets, and the attraction of cheap and available land. In this context, informality of small and medium-sized landholders (lack of land titles, limited access to credit, weak links with markets, lack of access to social benefits) interact with inadequate policies and weak institutions (principally, inconsistent land use classification and zoning procedures and policies for assigning land use rights; weak forest monitoring, enforcement, and governance; and problems of institutional coordination), economic conditions (sub-valuation of forests, opportunity costs of competing land use, capital limitations of farmers, lack of off-farm employment opportunities), and technological factors (limited technical assistance, technology use, and credit) on the forest margins. There, this complex of factors favors land speculation and extensive or inappropriate land or resource use, based on deforestation and forest degradation.

4.2. Assessment of the major barriers to REDD+

There are a number of barriers to REDD+ at the national level and within the accounting area that can affect the successful implementation of forest conservation, sustainable forest management, enhancement of carbon stocks and thus the reduction of emissions from deforestation and forest degradation. Moreover, many of these barriers are inter-related, which means that integrated solutions are often needed. Many are also related to underlying factors and conditions affecting deforestation and forest degradation. The principal barriers are presented below and are also discussed in section 4.1 above.

Policies. At the regional level, *de facto* policies of the regional governments in the accounting area have also encouraged deforestation by authorizing changes of use of forests to agriculture or by providing public services to settlers of non-classified forest or lands classified for forest use or by insufficient control and enforcement of deforestation and inappropriate land use. On the other hand, there are few policies that provide incentives for maintaining forests intact or reducing deforestation.

In general, the application of land use policies related to land classification, zoning, and titling need to be improved, since the settlement of land with unassigned rights or the invasion of lands classified for other use are highly associated with land speculation, inappropriate use, and increased rates of deforestation. The lack of formal rights also serves as a disincentive for investments in more sustainable and productive agricultural or forestry systems or forest plantations.

The new Forestry Law 29763 tries to restrict the possibilities of converting lands whose greatest use is forestry or protection to agriculture but requires multiple levels of approval before authorization of deforestation is granted. Moreover, the government is working to remedy the inconsistent and slow application of land classification, zoning, and land titling instruments at the local level. Under Peru's legal framework, scope also exists for designing policies or incentives that discourage deforestation or encourages sustainable land use. The development of the San Martin and Ucayali branding based on sustainability and social criteria, the use of cession of use contracts for agroforestry, and the orientation of public services in line with this policy, are examples.

Coordination. Although the Amazon contributes to about half of Peru's territory, there is little coordination between the national government and the Amazon, due to cultural barriers and low political weight. Land use policies are formulated at the national level, with little input from the Amazon, and often demonstrate a preference for agricultural development or infrastructure development. As a result, environmental/forest protection in sectorial strategies, plans, and budgets usually has a low profile. There is also a lack of sectorial integration or a territorial-based conservation-production approach and chronic under-funding.

Limited coordination among levels of government has also affected coherent planning and the ability to carry out sustainable land and natural resource development and its monitoring. Moreover, recent and on-going decentralization has resulted in the transfer of responsibilities for forestry, land use, and natural resource governance to the regional governments without assigning sufficient resources to the regions for their implementation, and monitoring is severely constrained by limited personnel and operating budgets. At the municipal level, local government projects, financed from public investment funds from the MEF, are not integrated with projects or plans at the regional government level and hence represent

another source of discoordination. Furthermore, key stakeholders in policy decisions are not usually brought on board, which encourages resistance on their part to the application of environmental/forestry instruments and regulations.

Clearly, greater efforts should be made to include environmental indicators in sectorial planning and to more closely integrate agricultural, forestry, and infrastructure sector development. The need for greater coordination in the context of Amazon development is being addressed by the high-level MIC convened by the office of the Presidency of the Council of Ministers as well as the MINAM-MINAGRI coordination group for forests and climate change. At the regional level, there are various efforts, financed by the international cooperation, to increase coordination through multi-stakeholder platforms, such as the Public-Private Coalition.

Consideration of environmental sustainability needs to be better integrated into economic development plans, programs and projects, preferably via across-the-board incorporation of consistent environmental indicators and a shared “vision of success” as part of the institutional planning and monitoring processes. In this regard, further discussion is needed with MEF in order to explore how environmental criteria might be incorporated in the evaluation process of public investment projects. Progress is also being made in increasing the consciousness of the importance of the Amazon and deforestation as part of Peru’s national emissions reduction strategy as well as Peru’s application to the OECD. At the regional level, the San Martín and Ucayali regional governments are basing their development plans on sustainable territorial development that incorporates a forest conservation-sustainable production-social inclusion (PPI) approach. It must be noted that the Framework Law on Climate Change adds new functions to sectors and governments at all levels to include climate change approach in their planning processes.

Resources and capacities. The lack of alignment between institutional resources, capacities, and responsibilities, especially related to the governance of land and natural resource use at the regional level, results in a reduced ability to plan, monitor, and control land use and apply existing policies and regulations or to extend governance to more remote areas. As mentioned above, regional governments have been assigned greater responsibilities for land and natural resource management, monitoring, and supervision, but lack sufficient funds, equipment, and personnel in order to carry out these tasks effectively.

Limited institutional presence. The large geographical extent of the Amazon and limited transportation or information networks and connectivity translate into high costs in order to maintain an adequate institutional presence. This limited institutional presence is due in part to the low political profile and budgets of the environmental sector and the Amazon, mentioned above. At the same time, it negatively impacts information flows and communication, monitoring, and the response to problems as well as the application of laws, policies, and regulations, especially in the forestry sector.

At the level of direct REDD+-related interventions in conservation, forestry, and sustainable agriculture, a number of barriers are also present:

High costs and limited economic returns of conservation discourage government investment and the lack of markets for environmental services affect the protection and maintenance of protected areas. On the other hand, ecotourism, a potentially important source of private investment in support of conservation, is incipient, of a relatively small scale, and is inadequately promoted.

Forestry. The forestry sector suffers from a complex set of problems related to illegal invasion of forests and illegal wood production, resulting in deforestation and forest degradation. These problems include: the incomplete process of assigning rights to forests, the high cost of legality, limited monitoring and enforcement systems for controlling land use, inadequate systems of verification and control of forestry plans and timber extraction, weak timber tracking and control (checkpoints) systems, corruption of functionaries, resource and personnel limitations of relevant institutions, and indiscriminating markets for illegal products. Furthermore, the absence of national markets for ecosystem services reinforces the sub-valuation of forests.

Sustainable, low emissions agriculture. A number of barriers to the implementation of sustainable, low emissions agricultural production exist: economic and knowledge barriers by lenders and lendees limit access to credit and TA and hinder the widespread adoption of more sustainable production practices, especially on the part of small and medium-sized producers; organization of producers in order to achieve economies of scale in input purchases or commercialization is insufficient; and participation and linkage with markets by producers are limited due to high farm-to-market logistical, transportation, and transaction costs, asymmetries of information, and little effort by the government to promote the unique products originating from the Amazon. Moreover, the majority of existing markets for agricultural/livestock/forest products do not recognize quality or sustainable production and hence do not compensate increased investments in these areas, which serves as a disincentive for investments in more sustainable production.

4.3 Planned actions and interventions under the ER Program

Overall Context

During the last five years, Peru's economy has levelled out after the commodity boom years of 2002-2013. Average growth has been 3.1%, with low inflation. It is expected that growth will remain at about 3%-4% annually in the medium term and that the government's emphasis on economic growth, poverty reduction and basic services, corruption, and administrative reform will continue (World Bank, 2017b⁴⁶).

With regards to natural resources and climate change, the government has taken climate change seriously and is gaining traction in addressing deforestation. As noted in section 2.3, progress in the legal, policy, and institutional areas related to deforestation and climate change has been made at the national level in recent years. At the regional level, the San Martín and Ucayali governments are promoting low emission economic development based on a production-protection-inclusion approach and have developed a number of supporting innovations including the development of regional branding based on attributes such as deforestation-free value chains, the creation of credit guarantee funds that promote alignment with low-carbon productive activities, the promotion of sustainable private investment, and land use rights (agroforestry cession of use contracts) and land use planning initiatives. Finally, a number of internationally funded projects are promoting concrete activities at multiple levels.

This proposal will build upon these processes as it aims to transition the regional economies in the accounting area from an economic development model based largely on extensive land use and deforestation to one that is more intensive, more sustainable, more equitable, and less carbon-dependent, especially for flagship crops such coffee and cocoa whose production has increased at the

⁴⁶ <https://www.worldbank.org/en/country/peru/overview>

expense of forest. It is expected that the ER Program will enhance and further the evolution of this transition by focusing on the implementation of a territorial-based production-protection-inclusion model of low emissions economic development. In concert with improvements in capacities and underlying productive and institutional enabling conditions, the promotion of forest conservation; sustainable forestry and agricultural production by small and medium producers, their organizations, and indigenous communities; and investment and employment creation by green businesses will contribute to reduced deforestation and greenhouse gas emissions and more sustainable land use.

Overall Goal and Strategy

The Emissions Reduction Program is expected to conserve, recover, and reduce pressure on forests in order to reduce forest emissions by about 26,774,277 tCO₂e⁴⁷ during 5 years, via the implementation of a comprehensive protection-production-inclusion approach. This approach responds to the principal drivers of deforestation – the low value of forests, agricultural expansion, land speculation and migration, and underlying productive and institutional weaknesses – by improving forest governance, use, and conservation, the sustainable intensification of agroforestry and tree plantations, the promotion of investments and employment by green businesses, and improvements in underlying productive and institutional enabling conditions, including multi-stakeholder platforms for planning, coordinating, monitoring, attracting investments and exerting political pressure related to sustainable land use and climate change. This combination has proven effective in Brazil and has been adapted to respond to the different socioeconomic and cultural context of Peru⁴⁸.

In so doing, the Program addresses a number of priority bottlenecks (marked in yellow in Table 4.3.1) identified in the Systematic Country Diagnosis carried out by the World Bank (World Bank, 2017c), and which are applicable to the forestry, agriculture, and land use sectors. It also takes into account strategic actors with traditionally low participation in development activities: the private sector, women, small farmers, migrants/subsistence level producers, indigenous communities, producer organizations, and land speculators.

The Program's strategy is based on current strengths including: rich natural capital, a good business climate, progress related to sustainable agricultural production systems and value chains, innovations by regional governments, and a host of programs and projects aimed at emissions reductions from forestry and land use (Figure 4.3.1). The latter is especially important, since the Program will essentially marshal a variety of existing or planned project and programs (DCI, FIP, PPS, WDE-Saweto, UN-REDD+, SERFOR-CAF, EII, PTRT2, ACP, Technoserve, regional PIPs – see section 2.3); to achieve its goals, especially those related to land titling, sustainable production systems, and increasing forest conservation and value. New activities will be limited in order to avoid duplication of efforts and keep costs low, and will be used largely to align, potentiate, complement, or address gaps of existing or planned projects (Figure 4.3.2).

Table 4.3.1. Priority areas and bottlenecks identified in the World Bank – Peru Country Partnership Framework, 2017 – 2021 (World Bank, 2017c⁴⁹).

⁴⁷ Includes about 10,500,000 tCO₂e in set-asides and Peru's commitment to the Carbon Fund of 6,400,000 tCO₂e (see Section 13).

⁴⁸ Szott, L.T. et al (2017). The protection-production compact in the Peruvian context. <https://www.mda.org.pe/media/2017/02/publications/ENGTPPCitPC.pdf>

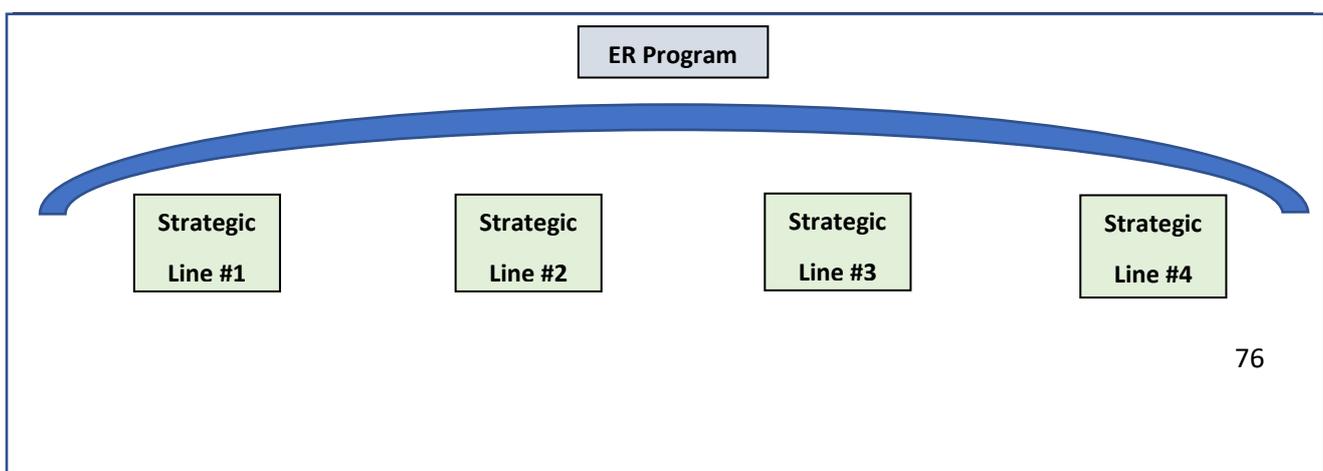
⁴⁹ <http://documents.worldbank.org/curated/en/919181490109288624/Peru-Systematic-Country-Diagnostic>

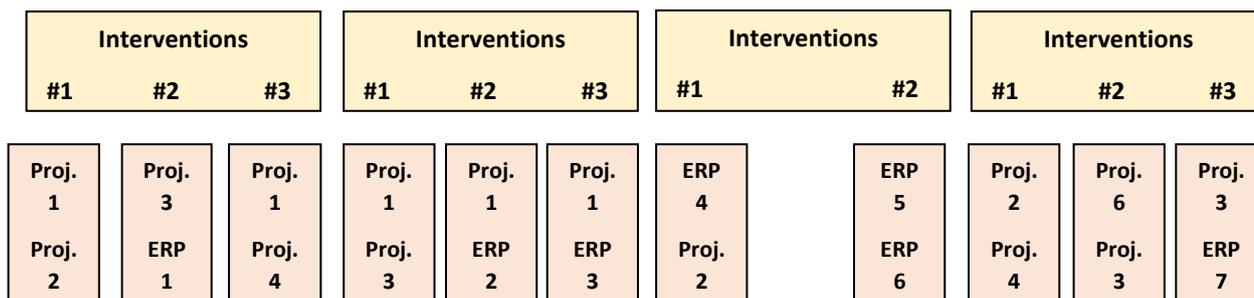
Priority Areas	Key Bottlenecks
Improving connecting infrastructure and public services	1. Large gaps in access to water and sanitation
	2. Lack of urban planning and cadasters
	3. Large gaps in connecting infrastructure
Raising human capital	4. Fragmented coverage and quality of services in health
	5. Low quality of services in education
Reducing factor and product market rigidities	6. Inefficiencies across social services
	7. Labor and tax regulations that hamper productivity and formalization
Right-sizing the fiscal envelope	8. Regulatory barriers to competition (at the subnational level) that hamper productivity and formalization
	9. Low efficiency of public spending
Improving government coordination, capacity, and law enforcement	10. Low tax revenues
	11. Unfinished decentralization process
	12. Weak enforcement of the rule of law in the justice system
	13. Weak enforcement of regulations
Reducing environmental risks	14. Low level of government coordination and red tape
	15. Low levels of trust and social capital (citizen-government)
	16. High exposure to climatic risks and natural hazards
	17. Reactive and loosely coordinated natural resources management

Figure 4.3.1. Bases of the intervention strategy.



Figure 4.3.2 Conceptual approach of the ER Program based on planned or on-going projects (Proj. 1, 2, 3, etc.) and new (ERP 1, 2, 3, etc.) activities.





Strategic Lines and Interventions

A comprehensive protection-production-inclusion approach will be used to decrease forest conversion and degradation and GHG emissions while increasing low emissions economic development that will decrease pressure on forests. This approach is aligned with the PPI strategies adopted by the San Martin and Ucayali regional governments, as well as major national level initiatives such as the NDCs and DCI.

Interventions are organized along 4 strategic lines shown below. The strategic lines and their interventions should be considered as a package, since they respond in an integrated fashion to the different conditions and drivers of deforestation found in the territory of the accounting area.

- Strategic Line #1: Increase conservation and the value of forests,
- Strategic Line #2: Increase productivity, sustainability and competitiveness of climate friendly production systems,
- Strategic Line #3: Promotion of investments and employment creation by green businesses, and
- Strategic Line #4: Improvement of institutional enabling conditions.

A summary of the interventions, their relationship to drivers of deforestation, and their focus is shown in Figure 4.3.3 and Table 4.3.2. Due to their complementary nature, the four Strategic Lines do not strictly map in a one-to-one nature with the drivers of deforestation, since various Lines are combined to target the drivers of low value of forests, extensive agriculture, or migration and land speculation.

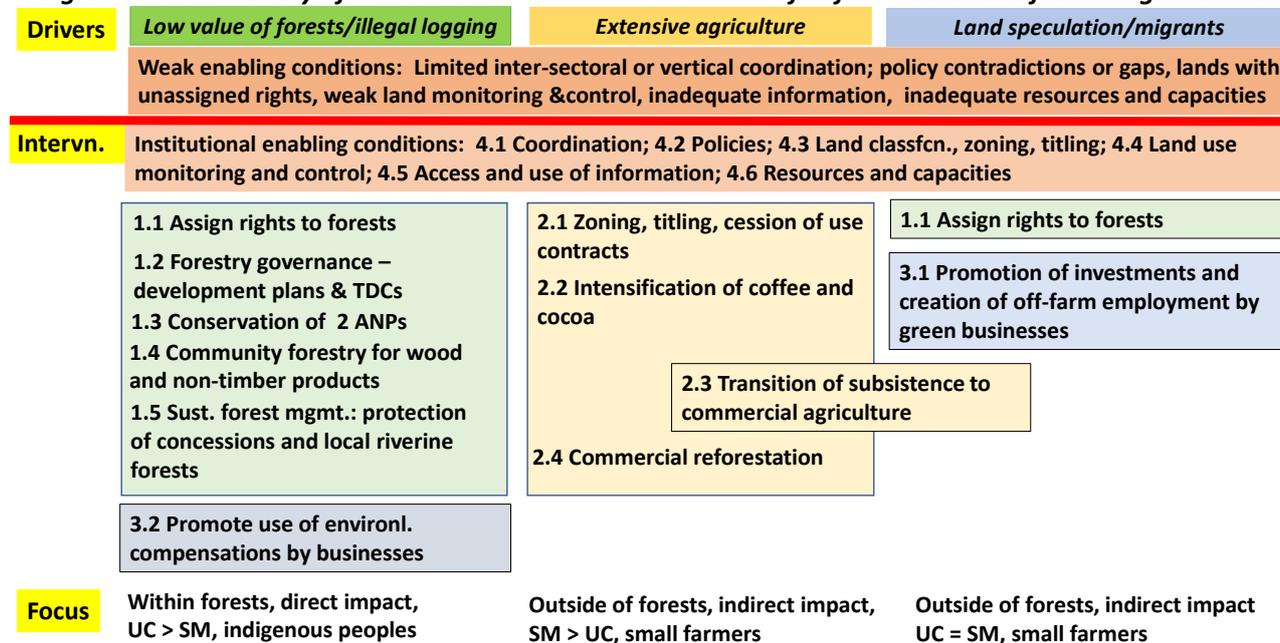
Strategic Line #1 primarily responds to forest conversion driven by the low value of standing forests. It includes classifying, zoning, and assigning rights to forests without rights as well as forestry-based activities such as sustainable forest management, community forestry and forest governance, and increased protection of select ANPs.

Strategic Line #2 promotes more intensive, profitable, and sustainable production systems such as coffee, cocoa, and forestry plantations as a response to extensive agriculture that substitutes periodic forest clearing for input use. By producing more from already deforested land, via the use of technology, inputs, credit, and technical assistance, this intervention will reduce pressure on forests.

Strategic line #3 also seeks to indirectly reduce pressure on forest through the promotion of investments and employment creation that can absorb marginal farmers or migrants, thus reducing their dependence on unsustainable slash-and-burn agriculture. It also encourages businesses to use surplus emission reductions generated by the ER Program to offset their carbon footprint. By contributing to the greater value of standing forests, it helps attack forest conversion driven by the low value of forests.

Finally, Strategic Line #4 complements and potentiates the other Strategic Lines. It aims to improve institutional abilities to plan, manage, monitor, and control land and forest use by all actors, including loggers, farmers, migrants, and land speculators.

Figure 4.3.3. Summary of interventions in relation to causes of deforestation and forest degradation.



Expected Emissions Reductions

These interventions respond to the principal drivers of deforestation, as shown in Table 4.3.3. Strategic Line #1 and the agroforestry cession of use contracts of Strategic Line #2 will reduce deforestation directly via improved forest conservation, forest management, and governance, whereas the majority of the interventions of Strategic Line #2 and Strategic Line #3 will indirectly reduce deforestation via the reduction of deforestation pressure by sustainable production activities outside the forest and the creation of employment alternatives to slash-and-burn agriculture. The expected impact of the interventions on emissions reductions is shown in Table 4.3.2. Emission reduction calculations are shown in Annex 5. More details of the intervention are shown in Annex 6.

Table 4.3.2 shows that land classification, zoning, and titling are expected to have the greatest impact on deforestation. This estimate is based on the ambition and budgets of current titling programs that will extend into the accounting period and will enable rapid progress during the first years of the ER Program. Although there are questions whether land tenure interventions always reduce deforestation, this assumption is based on empirical observation of deforestation in the Peruvian Amazon (see the “Deforestation and land tenure in the accounting area” sub-section of section 4.1) and is likely due to the fact that rights holders are more apt to protect their resources. In order to avoid double accounting of emissions reductions related to this intervention, emissions reduction calculations are based on mutually exclusive categories (for example, in intervention 1.1, the assignment of concessionary rights to forests with unassigned rights does not include the area of indigenous community without rights. Similarly, there is no double accounting with interventions 1.3 or 1.4 since these interventions occur on already titled land.).

Besides emission reductions, the Program is also expected to impact regional development via the promotion of investments and off-farm employment; with regards to the latter, about 4000 person-years of new jobs are expected.

Table 4.3.2. Expected impact of interventions on emissions reductions.

<i>Driver of deforestation</i>	<i>Intervention</i>	<i>Emission Reductions (tCO_{2e})</i>	<i>Ambition</i>	<i>B/C (\$/tCO_{2e})</i>
Strategic Line #1: Improve value and conservation of forests		19,039,631		
Low value of forests, illegal logging, and land speculation	1.1 Assign rights to forests (unassigned forests + untitled indigenous communities), including the creation of forest classification and zoning units. <ul style="list-style-type: none"> Assigning concessionary rights to forests Reclassification of existing forest concessions Titling Indigenous communities 	15,431,040	1,367,159 ha	0.18
	1.2 Strengthen community governance of forests. <ul style="list-style-type: none"> Community development plans. Improved community forest monitoring. Payments for conservation (TDCs) of forests on indigenous lands, including the formulation of community development plans financed by TDCs. 	7,768,999 See 1.5 7,662,041	518,722 ha 352,641 ha 495,796 ha	7.23
	1.3 Strengthen forest conservation in protected natural areas and conservation concessions. <ul style="list-style-type: none"> Strengthen forest conservation in 2 protected natural areas Develop improved management guidelines for ACRs 	663,414 274,713 388,701	638,000 ha 638,900 ha 528,900 ha 330,000 ha	0.67 0.67
	1.4 Community forestry management for timber and non-timber products.	557,323 557,323	766,283 ha 766,283 ha	0.67
	1.5 Strengthen sustainable forest management in forest concessions and in local riverine forests. <ul style="list-style-type: none"> MFC in reassigned concessions Increase protection of concessions 	261,278	433,000 ha	93.75
	1.5 Strengthen sustainable forest management in forest concessions and in local riverine forests. <ul style="list-style-type: none"> MFC in reassigned concessions Increase protection of concessions 	2,155,576 1,272,142 883,434	432,641 ha 340,000 ha 92,641 ha	11.95
Strategic Line #2: Increase productivity, sustainability and competitiveness of climate friendly production systems		7,518,256		
Extensive agriculture, migrants, and land speculation	2.1 Assign rights to small landholders, including registration and certifications to formalize plantation and agroforestry areas			
	2.2 Promote increases in productivity, intensification, and quality of coffee and cocoa in largely deforested areas. <ul style="list-style-type: none"> Cession of use, AT, credit, inputs AT only 	6,422,575 5,048,392 1,374,183	8,000 ha 15,000 ha	12.02
	2.3. Improve family agriculture from a subsistence level to a level that generate surplus for market <ul style="list-style-type: none"> Cession of use, AT, credit, inputs AT only 	861,029 460,226 400,803	2,000 ha 5,500 ha	8.36
	2.4. Promotion of commercial reforestation by businesses and community alliances.	234,652	18,550 ha	159.61
Strategic Line #3: Promotion of investment and off-farm employment creation by green businesses		187,389		
Land speculation and migrants	3.1. Promotion of employment creation and investments in low emission agri- or silvoindustrial activities.	187,389	1800 man-years jobs	89.43
	3.2. Promotion of linkages/emission compensations between forest conservation and commercial value chains	--	--	
Strategic Line #4: Improvement of institutional enabling conditions				
Low value of forests, illegal logging, extensive agriculture, migrants, land speculation	4.1 6 interventions related to coordination; policies; land use classification, zoning, and titling; land use monitoring, control, and enforcement; information access, use, and dissemination; and resources and capacities.	Impacts on emissions are included in the other strategic lines	Assumed to be included in the above	
Total		26,745,276		

Key assumptions in these calculations include:

- 1) Direct effects of avoided deforestation on emissions reductions are based on differences in rates of deforestation associated with the status quo (i.e. the rate associated with a given land tenure category) and a new rate associated with an “improved” land use category (e.g. the effect of assigning rights to forest without rights is to change the rate of deforestation of forests with unassigned rates to that of forestry concessions).
- 2) Private sector financing for MFC and MFS is available under the ambition used. A number of projects included in the ERPD have components aimed at improving private sector investment and management. Moreover, a large private sector actor (the Refinca business) has committed US\$ 60 million to reforestation and is involved in negotiations on the order of another US\$ 80 million with CAF in order to increase the participation of small reforesters. The ER Program will also increase the availability of credit and TA for producers.
- 3) The contracts of cession of use for intensified coffee and cocoa agroforestry systems have as a condition an 80% reduction in on-farm deforestation.
- 4) Yield increases are 100% for coffee and cocoa intensification based on credit, inputs, technologies, and TA, but are 20% for subsistence family farmers with access to only TA;
- 5) In the case of indirect effects of intensified agriculture or employment creation on emissions reductions, calculations are based on elasticities of deforestation vs. crop yield or deforestation vs. job creation. Indirect effects of agricultural intensification (i.e. an increase in yields will result in a reduced need to clear more land) results in a reduction of deforestation of 0.22 ha and 0.29 ha for every 100% increase in cocoa and coffee yields, respectively. This elasticity is based on the analysis mentioned in section on agricultural productivity and deforestation in section 4.1.
- 6) The creation of every new employment position for ex-farmers in green businesses will avoid 0.2 ha of deforestation annually for every person-year of employment created.
- 7) Most interventions are assumed to be applied in lowland areas and use an emissions factor for lowland forest (520.524 tCO₂e/ha). The exception is coffee, which uses an emissions factor for highland forests (379.883 tCO₂e/ha).

Finally, it should be noted that the emission reduction calculations for interventions 2.2 and 2.3 were sub-divided depending on whether: 1) the effect on deforestation is direct (i.e. direct on-farm conservation as a condition for receiving cession of use contracts) or indirect (i.e. increases in yield reduce the need to deforest additional land) and 2) in the latter case, the yields are dependent on the level of intensification as noted in assumption #2 above. The ambition level (number of hectares or farms) varies with these conditions (see Table 4.3.2)

The potential emission reductions during 5 years associated with the interventions total 26,745,276 tCO₂e and range from 187,389 tCO₂e (promotion of investments and off-farm employment) to 15,431,040 tCO₂e for forest and land classification, zoning, and titling. The variable most affecting the magnitude of emissions reductions is the area of the land or forest affected.

The interventions in the forest are expected to produce about 19,068,630 tCO₂e of emissions reductions, intensification of production systems will reduce about 7,518,258 tCO₂e of emissions, and promotion of investments and employment will contribute 187,389 tCO₂e of emissions reductions. The interventions in strategic line #4 (institutional enabling conditions), do not directly contribute to emissions reductions

(an exception is intervention 4.3, but these reductions are included in intervention 1.1), but are necessary in order to potentiate and complement the other interventions.

Viewed from the perspective of the direct or indirect effects of the interventions on deforestation, indirect effects on deforestation through employment creation and agricultural intensification amount to about 5,694,637 tCO₂e of emissions reductions, those related to the assignment of rights contribute 15,431,040 tCO₂e, while direct effects of forest conservation and productive activities contribute about 5,648,600 tCO₂e.

The cost/benefit analysis shown in Table 4.3.1 suggests that from a carbon emissions reduction standpoint, land classification and titling is the most efficient intervention, followed by conservation in ANPs, improved community governance of forests, and transitioning subsistence or migrant farmers to more commercial and sustainable agroforestry systems., sustainable MFS, and intensification of coffee and cocoa. All of these interventions cost less per ton of carbon emissions reduced than a payment equivalent to US\$ 5/tC. They also account for almost all of the emissions (26,061,957 tCO₂e).

On the other hand, MFC for timber or non-timber products, commercial reforestation, and the promotion of investment and employment creation have little impact on emissions reductions but can create significant increases in economic well-being, e.g. the creation of about 4000 person-years of jobs.

These results suggest that a low emissions development strategy needs both types of interventions – those that have high impact on emissions but little direct economic impact as well as those interventions with the opposite characteristics.

Strategic lines and interventions

Strategic Line #1 will improve the governance, protection, and income derived from forests, thus reducing incentives for their conversion. It concentrates on land tenure categories with large quantities of forests and relatively high rates of deforestation: forest lands with unassigned rights, including non-concessioned Permanent Production Forests (PPFs) and local, riverine forests; titled and non-titled indigenous communities; sub-utilized or inactive forestry concessions; and two conservation areas (149,870 ha in the ACR Cordillera Escalera in SM and the Sira territorial reserve in UC) under pressure from deforestation.

Interventions include:

- 1.1) Land classification, zoning, and titling,*
- 1.2) Improved forest governance and conservation by indigenous communities and local governments;*
- 1.3) Improved conservation in ANPs and conservation concessions;*
- 1.4) Community forest management (MFC) for timber and non-timber products in indigenous communities, and*
- 1.5) Sustainable forest management (MFS) in forestry concessions and local, riverine forests.*

All the interventions in this strategic line impact indigenous communities to some degree, due to the large amounts of forest under their control. Interventions in indigenous communities focus on community forest governance and conservation (intervention 1.2) and MFC (intervention 1.4). Interventions 1.1 (assignment of rights), 1.3 (ANPs), and 1.5 (MFS) may also include indigenous communities. Other actors include local governments, rural communities and loggers. The interventions

are relatively more important for Ucayali than San Martin, due to the larger quantity of forests in the former.

Line #2 will intensify coffee and cocoa production⁵⁰, improve subsistence family agricultural, and promote commercial reforestation by business-community alliances, thus reducing the need to clear more forest for extensive agriculture⁵¹. The interventions include:

2.1) Land classification, zoning, and assignment of rights (including agroforestry cession of use contracts) to small landholders,

2.2) Promote increases in productivity, intensification, quality, and commercial contacts of coffee and cocoa grown in deforested areas,

2.3) Increase the productivity of family agriculture from a subsistence level to one that generates greater surpluses, and

2.4) Promote commercial reforestation by business-community alliances in order to create jobs and reduce pressure on forests.

This intervention targets various types of actors: commercially oriented small and medium producers of coffee and cocoa; subsistence family farmers (indigenous, migrants, or long-term settlers), mainly on the agricultural frontier, who will be empowered to increase their productivity; small and medium reforesters or their associations; and businesses interested in reforestation associated or not with community reforestation associations in degraded, but commercially viable landscapes. The use of non-forested areas will be emphasized among all groups of actors.

Commercial agricultural interventions will be relatively more important in San Martin than Ucayali, while the transitioning of subsistence to commercial agriculture and reforestation will be relatively more in Ucayali than San Martin.

Strategic line #3 will promote investments and employment in “green” agricultural or forestry businesses in already deforested areas in order to absorb migrants and marginal farmers and thus reduce the pressure on forests. The interventions include:

3.1) Promotion of investments and the creation of off-farm employment opportunities by green businesses, and

3.2) Stimulating the use of emission reductions from increased forest conservation by socially responsible businesses in Peru or elsewhere, and PES, thus providing incentives for green investments in the accounting area.

Promotion of investments and the creation of employment by green businesses will absorb migrants and marginal farmers in sustainable activities and will reduce pressure on forests. Beside direct promotion of these investment, another tool to encourage green investments will be to facilitate the use and compensation of emissions reductions generated under the Program umbrella by socially responsible businesses in the region or elsewhere that are interested in reducing their carbon footprint via

⁵⁰ Historically, the expansion of oil palm has been an important cause of deforestation. However, there has been a substantial slowdown in large scale forest conversion to oil palm plantations, beginning with RSPO certification and other net zero deforestation initiatives in 2016-2017 (Finer et al., 2018). Therefore, interventions do not directly target oil palm as a direct driver of deforestation, although the institutional enabling conditions may have an indirect effect.

⁵¹ Direct conservation of on-farm forests will also occur as a condition for agroforestry cession of use contracts.

environmental compensations. The Program will provide information on certified emissions reductions available and will promote their use. It will also help link businesses interested in these emissions reductions with suppliers. This information will be backed by the National Registry of Mitigation Initiatives (including REDD+) and the Organizational Inventory of GHG of MINAM, which will facilitate the standardized reporting of emissions and emissions reductions of public and private organizations, in line with the InfoCarbono registry.

Strategies for PES will also be formulated; PES will contribute to increasing the value of forests in order to reduce their conversion to other uses.

These interventions are applicable to both regions, since both San Martin and Ucayali have ample deforested areas located near major highways (300,000 ha along the Federico Basadre highway between Pucallpa and Neshuya in Ucayali and along the IRSA Norte and Marginal Highways in San Martin) that can serve as potential sites for these investments. Principal actors targeted include private businesses with the potential to impact the employment of small farmers and migrants. Regional governments and local stakeholders will also be involved in the formulation of PES strategies.

Strategic Line #4 will increase the capacities of institutions to better respond to land use pressure through improved governance of land and forest resources and will ensure that economic development does not ultimately cause more deforestation. This strategic line operates more generally across the entire accounting area, since it affects the ability of the institutions to better plan, implement, monitor, and control land and natural resources in their territories. This strategic line is aimed at two different institutional levels: the strengthening of regional governments and the interactions of regional and national governments and sectors. In turn, this strategic line will support order the effectiveness of the other interventions.

The interventions include:

- 4.1) Alignment and coordination of sectors and different levels of the government,*
- 4.2) Establish regional and national policies to avoid land use change authorizations, promote local forests management and link deforestation reduction targets with additional public finance,*
- 4.3) Land and forest classification, zoning, and titling,*
- 4.4) Monitor, control, and enforce land and forest resources use at the regional level,*
- 4.5) Improve the availability, access, and use of information, especially at the regional level, and*
- 4.6) Increase institutional resources and capacities.*

Principal Activities

Principal activities associated with each intervention are shown in Table 4.3.3. Within this general scheme, a number of principal activities repeatedly appear within various interventions: the assignment of rights, the strengthening of producer associations, productive technical assistance, improvements in the access to credit and markets, and the use of incentives, and are indicative of the importance of these activities within the intervention strategy. More detailed descriptions of the activities are found in Annex 6.

Table 4.3.3 Summary of interventions and principal activities, their focal areas, and ambition.

Strategic Line #1: Conserve and increase value of forests	Ambition
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Focal Areas/Actors	Interventions	Principal Activities	Total	SM	UC
<ul style="list-style-type: none"> - Forests without assigned rights, principally in UC, - Forest concessions (principally in UC, but also SM), - Communal lands (principally in UC) - Riverine forests in UC -Indigenous communities -Logging companies and producer associations 	1.1 Forest and land classification, zoning, titling	Classification and zoning of forests without assigned rights (including non-concessioned PPF and legal clarification and assignment of rights of local, riverine forests), including the creation of forest classification and zoning units.	518,722 ha	378,722	60,000 + 80,000 (local riverine forests)
		Reclassification of forestry concessions.	352,641 ha	92,641	260,000
		Zoning and titling of indigenous communities.	495,796 ha		
	1.2 Strengthened governance of indigenous forests for conservation or sustainable production	Community development plans.	638,900 ha	148,900	490,000
		Improved community forest monitoring.	528,900 ha	38,900	490,000
Payments for conservation (TDCs) of forests on indigenous lands, including the formulation of community development plans financed by TDCs.		330,000 ha		330,000	
Promote the participation of forest stakeholders (communities, other forest users, private sector) in local governments					
1.3 Forest conservation in protected natural areas and conservation concessions	Increased protection in 2 ANPs (El Sira, Cordillera Escalera)	766,283 ha	149,870	616,413	
	Develop improved management guidelines for ACRs				
1.4 Community forest management (MFC) for timber or non-timber products	-MFC for timber	220,000 ha	20,000	200,000	
	-MFC for non-timber products	130,000 ha	25,000	105,000	
	-MFC for ecotourism, others	83,000 ha	8,000	75,000	
	There are 4 principal activities relevant to MFC: strengthening of the UTMFC, strengthening of community technical, commercial, and monitoring capacities, formation of commercial alliances, and development of community business plans.	Total= 433,000 ha	53,000	380,000	
1.5 Sustainable forest management (MFS) in forest concessions	Greater control of invasions of concessions in San Martin.	92,641 ha	92,641	0	
	Promote forestry clusters based on partnerships between the private sector and communities, mainly in a reclassified concession in Atalaya, Ucayali (approx. 180,000 ha + community lands).	260,000 ha		260,000	
	MFS by producer associations in local, riverine forests, including TA.	80,000 ha		80,000	
	Market promotion: Promote responsible purchases of legal wood by the State.				
Strategic Line #2: Increase the productivity, intensification, and competitiveness of climate friendly production systems.			Ambition		
Focus	Interventions	Principal Activities	Total	SM	UC
<ul style="list-style-type: none"> - Commercial coffee and cocoa farmers with or without land titles - Informal subsistence farmers/migrants on 	2.1 Assign rights to landholders	Promote cession of use contracts for commercial agroforestry in commercial (8,000) and subsistence (2000) farms.	10,000 farms4 groups	6,000	4,000
		Cession of use contracts for reforestation by producer groups		2 groups	2 groups

the agricultural frontier -Indigenous subsistence farmers on communal lands - Reforestation companies and reforester associations on already degraded lands		Implement plantation registration and producer certifications to formalize plantation and agroforestry areas			
	2.2 Promotion in largely deforested areas of increases in coffee and cocoa intensification, productivity, quality, and market linkages.	Establish the economic identity of producers in order to increase their access to credit and reduce their apparent risk as perceived by credit institutions.	8000 prod.	6,000	2,000
		Reduce interest rates of credit via new financial business models that reduce transaction costs and the risk profile of ventures and that make use of "social collateral", such as financing hedges, economic identities, and safeguards and guarantees (e.g. FONDESAM funds) to control the risk of loan losses.	8000 prod.	6,000	2,000
		Foment producer associations based on training and the sharing of experiences of these organizations and building consensus on the most effective ways to enhance their capacity.	1200 assns.	1000	200
		Promote the use of technologies, equipment, and inputs through technical assistance and increased access to credit (see above).	8,000 prod.	6,000	2,000
		Use local or regional competitions to stimulate adoption of measures that increase productivity and quality.	280	180	100
		Increase linkages to de-commoditized niche markets based on sustainability and quality via commercial contacts and promotion, the adoption of branding criteria, and the establishment of platforms for market intelligence and a virtual marketplace.	20,586 prod.	15,000	5,586
	2.3 Improve family subsistence agriculture in order to generate commercial surpluses.	Use block chains to reduce information-related asymmetries and transaction costs of value chains and increase product traceability.	8000 prod.	6,000	2,000
		Promote the use of crop insurance and credit.	2,000 prod.		2,000
		Promote the establishment of local producer associations.	200 assns.		200
Group TA provided by the regional governments.		3,000 prod.	500	2500	
2.4 Promotion of commercial reforestation by businesses &/or community alliances.	Improve linkages with local and domestic markets.	200 assns.		200	
	Promote commercial reforestation	2 businesses	1	1	
	Facilitate business-community alliances	2 alliances 2 alliances = 15,550 ha	1 (550 ha)	1 (15,000 ha)	
	Support community/producer organization partners (TA, funding)				
	Implement a Registry on forest and agroforestry plantations to ensure the property rights on products	7750 ha	275 ha	7,500 ha	

Strategic Line #3: Promotion of investments and off-farm employment creation by green businesses.			Ambition		
Focus	Interventions	Principal Activities	Total	SM	UC
"Green" agro- and silvoindustries on already deforested and/or degraded lands	3.1 Promotion of private investments in low emission agri- or silvoindustrial activities.	Strengthen investment promotion capacities in the regional governments (OPIPs) and the private sector ProUcayali, ProSanMartin) and public-private platforms (the Public-Private Coalition and Regional Development Agencies). Promote and facilitate "green" agricultural or forestry investments in already deforested areas, non-timber forest products, or sustainable forest-based businesses such as ecotourism. Promote and implement certificates of origin as part of regional branding.	7 institutions (1 pan-Amazon) \$15 million (\$5 million and 200 new jobs every 2 years)	3	3
	3.2 Facilitate use of ERs from reduced deforestation by businesses in Peru and elsewhere, as well as PES	Formulate strategies of PES for forest rights holders Promote availability of emissions reductions to businesses interested in reducing their carbon footprint through compensations. Facilitate linkages between providers and users of certified emissions reductions.	2 strategies 5 businesses using ER compensations from the accounting area	1	1
Strategic Line #4: Improve institutional enabling conditions.			Ambition		
Focus	Intervention	Principal Activities	Total	SM	UC
Broad coverage with a focus on the regions. <i>National, regional, and local governments and institutions</i>	4.1 Alignment and coordination of sectors and different levels of the government	Implement recommendation of the Multi-level, Multi-Sectorial Committee for Sustainable Development of the Amazon re: coordination mechanisms between national and regional governments and among sectors.	✓	✓	
		Implement the multi-level and multi-sector model of forest governance under development by MINAM and MINAGRI	✓	✓	✓
		Establish the Amazon Commonwealth (replacement of CIAM) to coordinate regional governments.	2	1	1
		Establish regional (public-private) development agencies – ARD to coordinate private and public actors at the regional level.	2	1	1
		Consolidate provincial development agencies (ADLs) of regional governments to link municipality planning and initiatives with regional government plans and programs.	1		
		Consolidate public-private platforms (the Public-Private Coalition) for multi-stakeholder input and lobbying for regional development.	1		
		Establish a science and technology development platform, led by IIAP, to provide natural resource-based technologies at the regional level.			

		Strengthen dialogue between the different levels of government, with other ministries and with civil society			
	4.2 Establish regional and national policies to avoid land use change authorizations, promote local forests management and link deforestation reduction targets with additional public finance	<p>Update regional forestry plans including new policies for the use of local forests, including riverine forests.</p> <p>Avoid authorizations by regional governments of changes of use of forests.</p> <p>Condition the eligibility of regional government incentives (public services, infrastructure) to alignment with reduced deforestation.</p> <p>Include criteria related to the reduction of deforestation in the evaluation framework of public investment projects (PIPs) of MEF.</p> <p>Reduce the regional governments' provision of public services to agricultural settlements located in areas classified for forest use.</p> <p>Update the forest regional plan</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p>	<p>✓</p>
	4.3 Land and forest classification, zoning, and titling (also see Strategic Lines 1 and 2)	<p>Prioritize Program participants and stakeholders in classification, zoning, and titling programs of the regional governments (see intervention 4.2).</p> <p>Clarify the rights related to local forests and riverine forests (see interventions 1.1, 1.5, 2.1, 2.3, and 2.5).</p> <p>Grant cession of use contracts para agroforestry and reforestation (see interventions 2.1, 2.2, 2.3, and 2.5).</p> <p>In UC, reassign rights to abandoned or expired forestry concessions (see intervention 1.5).</p>	<p>2</p> <p>✓</p>	<p>1</p> <p>✓</p>	<p>1</p> <p>✓</p>
	4.4 Monitor, control, and enforce land and natural resource rights and classification at the regional level.	<p>Disseminate the use of the GeoBosques monitoring system and the early warning system at the regional and local levels in order to monitor land use and compliance with responsibilities of rights holders.</p> <p>Promote forestry supervision and deforestation response by community control and forest surveillance committees, veedurías forestales, forest and wildlife management committees and forest custodianship of indigenous lands and other enabling forest titles</p> <p>Promote multi-stakeholder deforestation response teams outside of indigenous lands.</p> <p>Monitor cession of use contracts and regional branding of beneficiaries.</p>		<p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p>
	4.5 Improve the availability, access, and use of information, especially at the regional level.	<p>Improve the quality of agricultural information of the principal value chains.</p> <p>Improve, standardize procedures, and make official forestry information and a practical methodology for information gathering.</p>		<p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p>

		Centralize and link information related to early warnings, forestry and logging plans, transport documents, and forestry control checkpoints and inspections, especially in areas threatened by deforestation and degradation (see SNIFFS, below).		✓	✓
		Consolidate and link SINIA and SNIFFS, including the forest transparency portal.	✓	✓	✓
		Update frequently and improve public access to information via the internet in order to reduce asymmetries of information.	✓	✓	✓
		Promote public environmental education / consciousness related to deforestation and sustainable land use.			
		Strengthen regional capacities in digital and geographical information management			
	4.6 Increase institutional resources and capacities	Train institutional personnel, especially at the regional level		✓	✓
		Incorporate technologies, protocols, and the capacities for their use in order to reduce costs/improve information quality.		✓	✓
		Form partnerships with other actors, especially the private sector, in order to extend institutional capacities and reach.		✓	✓
		Promote a common vision and local capacity to formulate PIPs at the regional and municipal levels.		✓	✓

Intervention Location and Actors

The relative importance of the interventions varies geographically and by principal actors. The geographical location of the interventions and activities and the actors involved reflect the work plans and objectives of the projects and include high priority districts and hotspots identified in section 4.1 (see Annex 7). Due to the predominance of forests and its large indigenous population, Strategic Line #1 interventions will concentrate on indigenous populations in Ucayali. Interventions of Strategic Line #2 related to intensified coffee and cocoa production by small farmers will be relatively more important in San Martin, but those related to improving subsistence family agriculture will be relatively more important for small farmers, migrants, and indigenous communities in Ucayali. The large extent of deforested and degraded land along the Federico Basadre highway also makes Ucayali a prime candidate for the establishment of tree plantations by businesses and/or communities under Strategic Line #2 or the promotion of investments by businesses and the employment of migrants or marginal farmers in green agri- or forestry businesses of Strategic Line #3. Strategic Line #4 involves mainly regional, but also other, levels of governments and is equally important in both regions.

Within the regional governments, key actors as agents and targets of implementation are: the Regional Economic Development Directorate, the Regional Agrarian Directorate, the Regional Environmental Authority, and the Forestry and Wildlife Management Unit (UGFFS) due to their responsibilities for local economic development, land titling, and forestry planning and supervision and their existing limitations to effectively carry out these responsibilities.

The combination of these intervention sites results in wide geographical coverage in San Martin as well as Ucayali: at least 13 of the 15 districts of Ucayali and 63 of the 77 districts of San Martin. In Ucayali, forest-based activities are more concentrated in Tahuania, Masisea, Raimondi, Iparía, Calleria, and Sepahua districts, while agriculture and reforestation are more concentrated in the Padre Abad, Curimana, Irazola, Campoverde, and Nueva Requena districts. In contrast, in San Martin, the relatively few forestry activities are located in Caynarachi, Barranquita, Alto Saposoa, Pinto Recodo, el Porvenir, and Moyobamba districts and agricultural interventions are widely disseminated in most of the districts in the region, in line with San Martin’s greater agricultural vocation (Annex 7).

Implementation Road Map

The 11-year duration of the ER Program will include a 1-year preparation period, 5 years of implementation under the aegis of the FCPF, and 5 additional years based on other sources of funding. Implementation will begin in 2020, although work on some project activities as well as preparatory work will begin prior to that date). However, the majority of enabling conditions and direct interventions will begin in year 1 of implementation.

An approximately one year-long period of preparation will focus on obtaining feedback regarding the ER Program proposal and implementing Readiness activities that are critical for ER Program implementation. These include consolidating institutional arrangements and coordination mechanisms at the regional and local levels, further developing systems for monitoring, safeguards, the emissions registry, and benefit distribution plan, and preparing PIPs for funding.

A tentative chronogram and specific actors participating is shown in the following Table.

Table 4.3.4. Principal activities and actors during the preparatory phase of ER Program implementation

Theme	Expected Completion Date	Participants
Benefit sharing plan: complete draft Advanced draft Final version	June 2019 Sept. – Oct. 2019 Nov. – Dec. 2019	MINAM, MINAGRI, MEF, GOREs, indigenous organizations, private sector
Private sector engagement plan	June 2019	MINAM, MINAGRI, GOREs, ARA, DRFFS, indigenous organizations, private sector
Location and specific actors for Interventions	June 2019	MINAM, MINAGRI, GOREs, ARA, DRFFS, indigenous organizations, private sector
Mechanism for citizen attention (grievance mechanism)	October 2019	MINAM, MINCU, SERFOR, GOREs, indigenous organizations, private sector, civil society, academia.
Harmonization of REDD+ project base lines	December 2019	MINAM, MINAGRI, GOREs, private sector
Financial mechanism	December 2019	MINAM, MINAGRI, MEF
Local monitoring systems for land use, safeguards, benefits distribution, non-carbon benefits	December 2019	MINAM, GOREs, indigenous organizations, private sector
Registry of emission reductions	April 2019 (design) February 2020 (implementation)	MINAM, MINAGRI, GOREs, other State sectors

ESMF	October 2019 (design)	MINAM, MINCU, SERFOR, MINAM, MINAGRI, GOREs, indigenous organizations, private sector, civil society, academia.
SIS	September 2020 (operation)	MINAM, MINCU, SERFOR, MINAM, MINAGRI, GOREs, indigenous organizations, private sector, civil society, academia.
Credit interventions	November 2019	FONDESAM, GOREs, FOGAPI, COFIDE, and IFIs.
Blockchain use for economic identity and value chain traceability	November 2019	BanQu, FONDESAM, GOREs, FOGAPI, COFIDE, IFIs, GOREs.
Institutional coordination and alignment of projects	December 2019	MINAM, MINAGRI, GOREs, indigenous organizations, projects, Amazon Commonwealth Public - Private Coalition. Relevant themes include the use of environmental/deforestation indicators, orientation of technical assistance programs to producers and communities, project monitoring, information sharing and reporting, cross-project fertilization and events, and linking producers with credit.

The implementation of the proposed activities largely obeys the chronograms of the underlying projects. Although not all projects are programmed to be active up to 2024, many are already active, which will contribute to rapid start-up of the ER Program. The tentative chronogram for these activities is shown in Annex 6.

4.4 Land tenure

Land tenure in Peru and property rights

The Peruvian legal framework is substantially defined by the Constitution, which guarantees land rights to individuals as well as to indigenous peoples, and other forms of tenure. The Peruvian Constitution (especially articles 66, 67, 70, 88 and 89) recognizes and provides protection to:

- The right to private property;
- The ownership of agricultural land in private, communal or various associative forms;
- The use and exploitation of natural resources by individuals;
- The sustainable use of natural resources;
- The use and exploitation of land and natural resources by peasant and indigenous communities.

In the case of land, the general principle is that there is no property without an owner. If the land does not have a private owner, then it belongs to the State.

Types of land tenure and uses

Private property

Peruvian legislation includes the classic division of land uses, differentiating land for agricultural use, livestock use and forest use, although in practice there are combinations such as agricultural, agroforestry

and silvopastures uses. Property rights are recognized for land classified for agricultural or livestock use, but property rights to forest lands (see paragraph below), in principle, are not recognized or assigned, since these lands are considered patrimony of the Nation. However, historically and after processes of change of use (mostly carried out illegally) lands with forest aptitude have been given in property to individuals; nowadays these historic private rights to forest lands are still recognized, but owners are required to maintain a percentage of forests in those properties (minimum of 30% of the forest mass) according to article 38 of the Forestry and Wildlife Law. It should be noted that authorizations of changes of use of forest lands are in the process of being eliminated, as one of the goals under the DCI.

The legal framework with regards to the ownership of agricultural land is essentially provided by the provisions of the Civil Code and other complementary laws, in particular Law No. 26506⁵² and Law No. 27360⁵³, which allow their holders access to the right of ownership, as well as to other rights (possession, lease, etc.).

Communal lands and territorial reserves

Communal land rights are provided by the Indigenous Communities and Agrarian Development Act of the Low and High Jungle (Decree-Law No. 22175); the General Law of Peasant Communities (Law No. 24656), and the Demarcation and Titling of the Territory of Peasant Communities Act (Law No. 24657). In addition, there is a Law for the Protection of Indigenous or Original Peoples in Initial Contact (Law No. 28736), which allows the establishment of Territorial Reserves for these peoples, prohibiting the presence of individuals and companies of any kind on these lands.

From 1920 until 1993, when the current Constitution was approved, indigenous community lands (later called campesino communities and indigenous communities) were subject to a regime of legal protection. Specifically, these lands could not be alienated (i.e. they could not be bought or acquired by private individuals in any way), seized (thus avoiding the eventual judicial auction of their lands), nor could they be lost due to extinctive prescription, which allows a person who manages land in a public, peaceful way, as if they were an owner, to claim, after a time fixed by law, property rights over that land, despite it being owned by another person.

Currently, the loss of land by prescription is the only protection provided for indigenous lands by the Constitution. A community can lose ownership rights over part of its land or to the resources existing on that part of the land, either because it sells it (or transfers it legally by other means) or because it is auctioned off after an embargo.

According to Peruvian law, communal lands are owned by the community as a whole, that is to say, by all the comuneros, with no one being able to invoke individual property rights over any portion of that territory. It should be pointed out that, according to the legislation in force, indigenous communities can receive property titles only over lands for agricultural and livestock use; in the case of forest lands, which also make up their territory, the State gives them a contract of cession in use, which allows indigenous peoples to use these lands, fulfilling certain conditions, but does not allow them to dispose of them (that is, they cannot sell them, cede them, mortgage them, etc.).

As long as they maintain the ownership of their agricultural or livestock lands, the laws recognize the right of the community to use exclusively the existing resources there (except for minerals and hydrocarbons). In the case of forests found on communal land, the commercial use of forests for timber or non-timber

⁵² Law on Private Investment in the Development of Economic Activities in the Lands of the National Territory and of Peasant and Native Communities, approved in July 1995.

⁵³ Agrarian Promotion Law, approved in October 2000.

production wood requires a Forest Management Plan and other obligations specified by the Forestry and Wildlife Law.

Forest lands and concessions

In the case of forest lands, particularly those located in the Amazon region, the Forestry and Wildlife Act, No. 29763, establishes that lands suitable for forestry, with or without forest cover, are owned or controlled by the State. Individuals or companies can exploit forests via forest concessions, while indigenous peoples (especially indigenous communities) have the right to exploit forest lands, as regulated by the Forestry and Wildlife Law, but cannot own them.

Forest concessions, both for timber and for other forest resources, are regulated extensively by the Forestry and Wildlife Act, No. 29763 and its regulations: Regulations for Forest Management (S.D. 018-2015-MINAGRI), Regulations for Wildlife Management (S.D. 019-2015-MINAGRI), Regulations for the Management of Forest Plantations and Agroforestry Systems (S.D. 020-2015-MINAGRI) and Regulations for Forest and Wildlife Management in Native Communities and Peasant Communities (S.D. 021-2015-MINAGRI).

Holders of forest concessions for the sustainable use of forest and wildlife resources have the right to use and enjoy such natural resources and, consequently, the ownership of legally extracted fruits and products, "as well as the right to benefits from ecosystem services arising from their management" (art. 51). Moreover, Article 109 of the Forestry Law establishes with absolute clarity the ownership of rights over ecosystem services: "The benefits arising from the economic exploitation of forest ecosystems and other ecosystems of wild vegetation are part of the enabling titles. These provisions of the Act are confirmed in articles 42(b) and 99 of the Regulations for Forest Management, approved by Supreme Decree No. 018-2015-MINAM.

Concessions on uncultivated lands are regulated mainly by Act No. 26505 and its Regulations (Supreme Decree No. 011-97-AG), Legislative Decree No. 1089 and complementary regulations (Supreme Decree No. 026-2003-AG). They permit the practice of agriculture on State lands classified for agricultural use.

Protected Natural Areas

Finally, there is a Law of Protected Natural Areas (Nº 26834) as well as several norms on unproductive lands (unproductive lands for agriculture due to the lack or excess of water).

The different ownership and tenure regimes are presented schematically in the following Table.

Table 4.4.1. Forms of land tenure

Form of ownership	Rights granted
Private property	It allows private property holders (nationals or foreigners), whether individuals or companies, to use, enjoy (use its fruits and products) and freely dispose (lease, transfer, mortgage, or assign) of the land.
Communal property	Allows communities to use and enjoy their land. They may also dispose of their lands based on decisions by communal Assemblies, based on percentages determined by special laws.
Territorial Reserves	Established by the State on behalf of indigenous peoples in voluntary Isolation or in initial contact. Individuals cannot access rights to these lands.
Forest concession	Allows private individuals to harvest timber and other forest products on State-owned forest land.
Concession on uncultivated lands	Allows individuals to practice agriculture on uncultivated State land classified for agricultural use and then, once the contractual obligations have been fulfilled, these lands can become private property.

Natural Protected Areas	Land owned by the State for conservation due to its biological diversity or other values of cultural, landscape or scientific interest.
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Rights to other natural resources

Peruvian law assigns the dominion of natural resources to the nation or the State. Article 66 of the Constitution states that natural resources are the patrimony of the Nation. The Organic Law for the Sustainable Use of Natural Resources, No. 26821, reiterates this principle and develops guidelines for its treatment by special laws for the different natural resources.

Along these lines, the Water Resources Act, No. 29338, establishes that water and water resources are the property of the Nation, and that private property rights over water are not recognized. Therefore, individuals must request the granting of a right (normally a water use license, in the case of permanent uses, such as agrarian use, or a permit or authorization, in the case of temporary uses). The Law, however, allows the use of water for the satisfaction of basic needs, without the need to manage any rights. The Act also broadly recognizes the right of peasant and indigenous communities to use water in accordance with their uses and customs.

The General Mining Law recognizes the dominion of the State over the minerals existing in the subsoil, empowering individuals, through mining concessions, to extract them and to take ownership of the minerals extracted. Although concessions are expressed on maps over a portion of the territory, this is a different right from that of landowners.

In the case of oil and gas, Organic Law No. 26221 of Hydrocarbons establishes, as in the case of mining, that the hydrocarbons located in the subsoil are the property of the State, which may enter into exploration and exploitation contracts with private companies.

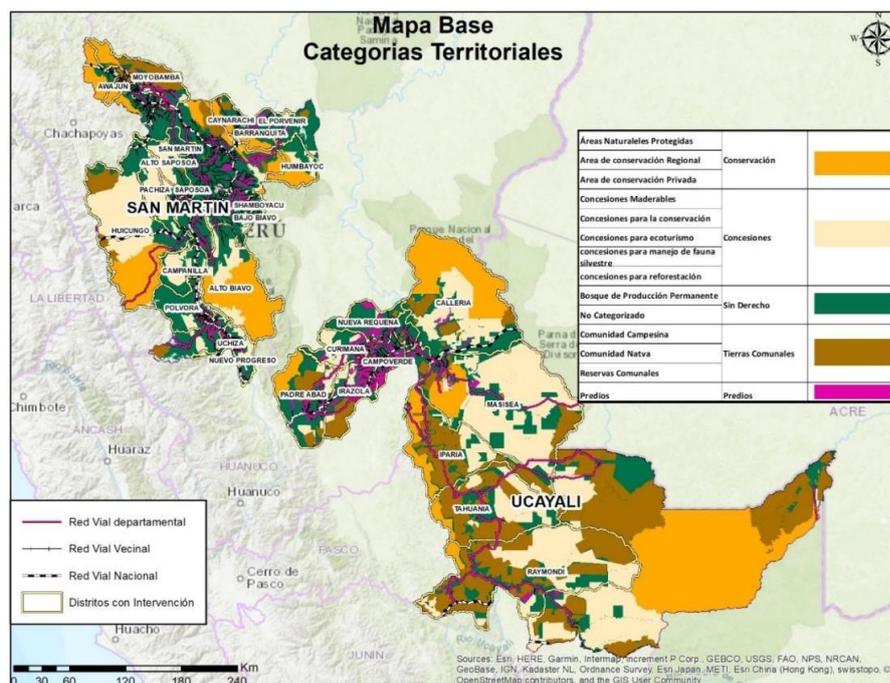
The General Law of Fishing, No. 25977, also considers as patrimony of the Nation the hydro biological resources contained in the jurisdictional waters of Peru. Although the Law focuses mainly on fishing in marine waters, it recognizes small-scale or artisanal extraction activities, which is applicable to the native populations and communities of the Amazon.

The Ecosystem Services Compensation Mechanisms Act, No. 30215, promotes, regulates and supervises compensation mechanisms for ecosystem services derived from voluntary agreements that establish conservation, recovery and sustainable use to ensure the permanence of ecosystems, including carbon sequestration. The law allows landowners, landowners and those with licenses for the use of renewable resources to contribute to ecosystem services. This includes the possibility of benefiting from Voluntary Emission Reduction (VER) certificates, although this area still requires more precise regulation. Article 5 of Law No. 30215 empowers contributors of ecosystem services to receive a payment conditioned on the realization of actions of conservation, recuperation, and sustainable use of the sources of ecosystem services.

Current land use

A mosaic of land use rights exists in San Martin and Ucayali (Figure 4.4.3).

Figure 4.4.3. Land tenure categories in the accounting area.



Agricultural use

The majority of Peru's farms are small-scale. According to the IV National Agricultural Census (conducted in 2012), 82% of agricultural units have less than 5 ha and 90% are units of less than 10 ha.⁵⁴ Likewise, the IV National Agricultural Census shows that 99% of the agricultural units are in the hands of natural persons, while only 0.11% of the agricultural units correspond to societal forms,⁵⁵ as can be seen in the following Table 4.4.2. It should be noted that this Table does not differentiate between types of land use (e.g., pastures, agriculture, forests) within agricultural units.

Table 4.4.2. Distribution of Agricultural Units by legal status of owners, 2012 (INEI, 2012).

Agricultural Categories	Producers	%	Surface ha
Natural person	2,246,702	99.37	14,112,231
Closed corporation - SAC	1,892	0.08	369,529
Open corporation - SAA	459	0.02	169,026
Limited Liability Company -SRL	284	0.01	77,451
Individual Limited Liability Company - EIRL	345	0.02	32,446
Agricultural Cooperative	92	0.00	44,857
Peasant community	6,277	0.28	16,359,074
Indigenous Community	1,322	0.06	7,106,751
Other	3,610	0.16	471,100
Total	2,260,983	100.00	38,742,465

Although the number of peasant and indigenous communities is very unrepresentative with respect to

⁵⁴ When presenting the tenure structure according to the size of the agricultural units, the Census does not differentiate between uses i.e. natural pastures, forests or agricultural use (whether under irrigation or rain-fed).

⁵⁵ These corporate forms include: open stock companies, closed stock companies and limited liability companies.

the total (contributing to 0.34% of the agricultural units), the information from the IV National Agricultural Census shows that together they account for 72% of the total agricultural area of the country⁵⁶. According to Peruvian law, communal lands are owned by the community as a whole, that is to say, by all the community members, with no one being able to invoke individual property rights over any portion of that territory. However, it should be noted that within communities there is family ownership of plots for agricultural use (especially in peasant communities and to a lesser extent in indigenous communities) and increasingly individual property rights are being recognized within communities. Thus, at the national level, small property and smallholdings predominate in terms of the number of owners of farms, but in extension communal lands predominate.

Most of the owners of agricultural units in the country define themselves as owners (73%), although with different degrees of formality. The peasant and indigenous communities, which own 72% of the total national agricultural area, have mostly communal property titles, although many of them still need to go through land regularization processes in order to have secure tenure.

In the accounting area, agricultural land tenure is similar to that at the national level. The census information for the Ucayali and San Martín regions provides information on agricultural land tenure and the legal status of its owners (Table 4.4.3).

Table 4.4.3. Distribution of Agricultural Units by legal status, in San Martín and Ucayali

Agricultural Unit	San Martín			Ucayali		
	Number Agriculture Units	%	Extension (ha)	Number Agriculture Units	%	Extension (ha)
Natural person	91,067	100%	955,273	25,300	99	426,464
Closed Company - SAC	41	0%	23,392	18	0%	39,996
Open Joint Stock Company - SAA	11	0%	3,318	1	0%	40
Responsible Company Limited	5	0%	51	4	0%	351
Individual Limited Liability Company - EIR	13	0%	601	2	0%	32
Agrarian Cooperative	3	0%	4,290	1	0%	25
Peasant Community	2	0%	24	0	0%	0
Indigenous Community	37	0%	334,516	236	1%	1,853,846
Other	45	0%	1,544	18	0%	1,153
TOTAL	91,224	100%	1,323,017	25,580	100%	2,321,909

Source: IV National Agricultural Census, INEI 2012.

Communal lands and territorial reserves

In the case of indigenous communities, it should be noted that information regarding indigenous communities provided by the Directory 2016 - Native Communities of Peru, published by the Institute of the Common Good, differs from data from the IV National Agricultural Census. According to the former, there are 101 native communities in San Martín, 29 of which are recognized and titled, 70 are recognized but with pending title, and 2 are yet to be recognized and titled. In Ucayali, the same source reports the existence of 336 native communities, 234 recognized and titled, 54 communities recognized but with pending title, and 48 are yet to be recognized and titled.

⁵⁶ This is the result of the "Communities Report - Complementary Information Sheet, IV Cenagro" of the National Institute of Statistics and Informatics -INEI- that adjusts the results on communities, increasing to 19'888,192 ha the amount of land owned by peasant communities, and to 8'046,415 ha those controlled by native communities, for a total of 27'934,607 ha of communal lands.

In the case of campesino communities, the Directory 2016 – Campesino Communities of Peru shows that there are 63 campesino communities in San Martín, of which one is recognized and titled, while 3 are recognized but with pending title, and 59 are yet to be recognized and titled. In Ucayali, the same source records 139 peasant communities, all of which would be unrecognized and untitled.⁵⁷

The Protection of Indigenous or Native Peoples in Initial Contact Act No. 28736 has created five Territorial Reserves to protect peoples in isolation and in initial contact, in order to guarantee the life, health and continuity of their traditional ways of life. These Reserves are mainly located, at least partially, in Ucayali and total 2,799,501 ha, according to the following detail:

- Isconahua Territorial Reserve, with 275,665 ha (Ucayali)
- Mashco Piro Territorial Reserve, with 768,848 ha (Ucayali)
- Murunahua Territorial Reserve, with 481,160 ha (Ucayali)
- Territorial Reserve Kugapacori, Nahua, Nanti and others, with 443,887 ha (between the departments of Cusco and Ucayali).

However, a report prepared by the Institute for Democracy and Human Rights of the Pontificia Universidad Católica del Perú (IDEH-PUCP) considers that there is a diversity of peoples or segments of indigenous peoples in voluntary isolation and others in initial contact, generally settled in protected natural areas, where they are not recognized by the State, as explained below.

Protected Areas

In application of the Law of Protected Natural Areas (ANPs), the State has defined as its domain different protected natural areas (with the exception of private conservation areas), which may not be assigned in property to individuals. There are ten categories of protected natural areas. In three of them, national parks, national sanctuaries and historic sanctuaries (defined as areas of indirect use), only scientific studies and tourist activities can be carried out under strict controls. In the other seven categories (direct use), the exploitation and extraction of some resources is permitted, mainly by the local populations themselves. Direct use areas are National Reserves, Landscape Reserves, Wildlife Refuges, Communal Reserves, Protected Forests, Hunting Reserves and Regional Conservation Areas. Reserved areas constitute another category and have a transitory character, while studies are carried out to establish their definitive categorization (article 13 of the ANP Law).

According to official information, there are 15 National Parks covering 10,394,366 ha; 9 National Sanctuaries, with 317,366 ha; 4 Historic Sanctuaries, with 41,279 ha; 15 National Reserves with 4,652,851 ha; 3 Wildlife Refuges, with 20,775 ha; 2 Landscape Reserves, with 711,818 ha; 10 Communal Reserves, with 2,166,588 ha; 6 Protected Forests, with 389,987 ha; 2 Hunting Reserves, with 124,735 ha; and 10 Protected Natural Areas of Transitional National Administration, with 636,717 ha. In addition, there are 21 Regional Conservation Areas and 130 Private Conservation Areas. All of them total 22,924,711 ha in the marine and terrestrial areas of the national territory⁵⁸. SERNANP's website also presents the map of

⁵⁷ Information System of Peasant Communities. IBC-CEPES, 2016.

⁵⁸ Figures taken from the Listing updated December 17, 2018 from the SERNANP Web site <[<http://www.sernanp.gob.pe/documents/10181/165150/Listado+ANP+17.12.2018.pdf/cb841a1a-7ac3-4236-911b-eef3d4b891c3>>](http://www.sernanp.gob.pe/documents/10181/165150/Listado+ANP+17.12.2018.pdf/cb841a1a-7ac3-4236-911b-eef3d4b891c3)>

the various ANPs established in the country, although as of October 2018.⁵⁹

In the department of San Martín there are two National Parks, in addition to a Regional Conservation Area, a Protected Forest and eight Private Conservation Areas, according to the following detail, taken from SERNANP's listing:

- The Abiseo River National Park was created in August 1983, by Supreme Decree No. 064- 1983-AG, with an area of 274,520.
- Cordillera Azul National Park was created in May 2001, by Supreme Decree No. 031- 2001-AG, with 1,353,190 ha and is located in the departments of San Martín, Loreto, Huánuco and Ucayali.
- Regional Conservation Area of Cordillera Escalera was created by Supreme Decree No. 045-2005-AG, in December 2005 and has an area of 149,870 ha. It contains 7 communities (of the Kichwa Lamista and Shawi ethnic groups).
- Regional Conservation Area Bosques de Shunté y Mishollo, created by D.S. Nº 016-2018-MINAM, in December 2018, with an area of 191,405 ha.
- Alto Mayo Protected Forest, created by Supreme Resolution No. 0293-1987-AG/DGFF 23.07.1987, with 182,000 ha, plus a buffer zone of 247,656 ha⁶⁰. In its interior are located 14 indigenous aguaruna communities.
- The Private Conservation Areas Tambo Ilusión (R.M. Nº 075-2010-MINAM), Juninque (R.M. Nº 033-2011-MINAM), Larga Vista I (R.M. Nº 033-2011-MINAM), Larga Vista II (R.M. Nº 033-2011-MINAM), Larga Vista II (R.M. Nº 033-2011-MINAM), Larga Vista II (R.M. Nº 075-2010-MINAM), Juninque (R.M. Nº 033-2011-MINAM), Larga Vista I (R.M. Nº 033-2011-MINAM). No. 021-2013- MINAM), Pucunucho (R.M. No. 040-2013-MINAM), Ronsoco Cocha (R.M. No. 040-2013- MINAM), Palmonte (R.M. No. 157-2016-MINAM) and Las Naranjas (R.M. No. 147-2018- MINAM). All of them add up to a little more than 529 ha, being Ronsoco Cocha the largest, with 363 ha.

The following map, taken from the Master Plan 2018-2023 of the Regional Conservation Area "Cordillera Escalera" (approved by Regional Ordinance No. 010-2018 of the Regional Government of San Martín), shows the Natural Protected Areas in San Martín, including those proposed.⁶¹

It should be noted that in the Regional Conservation Areas, such as the Regional Conservation Area Cordillera Escalera and the Regional Conservation Area Bosques de Shunté y Mishollo, no buffer zones are established. In fact, as a SERNANP document points out, "Unlike the national categories of ANPs, for which a space around is defined as a buffer zone, this instrument does not apply in the case of RCAs".⁶²

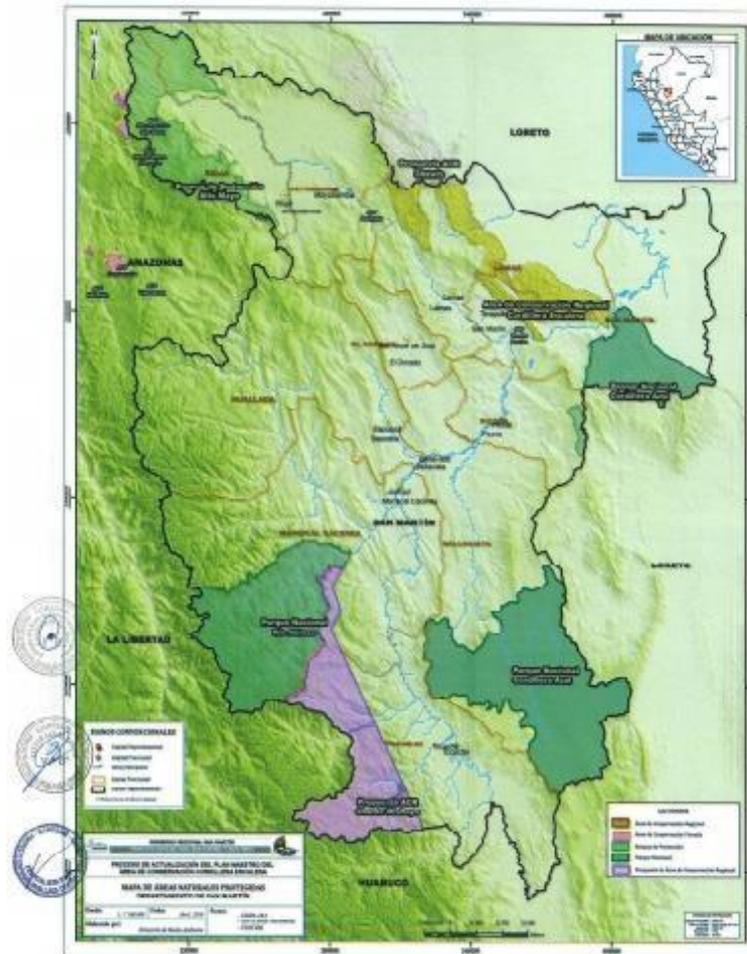
⁵⁹ Retrieved from <<http://www.sernanp.gob.pe/documents/10181/165198/MAPA+ANP+25-10-2018.pdf/06b30e24-3e5b-404c-9874-a3e6f71fab2e>>>

⁶⁰ Alto Mayo Protected Forest Master Plan 2008-2013. INRENA, 2008, p. 178. In: <<https://legislacionanp.org.pe/images/documentospdf/PlanesMaestros/BosquesProteccion/AltoMayo/Plan%20Maestro%202008%20-%202013%20BP%20Alto%20Mayo%20ver%20publ.pdf>>>

⁶¹ Taken from <<https://www.regionsanmartin.gob.pe/OriArc.pdf?id=107109>>>

⁶² *Regional Conservation Areas. Documento de Trabajo N°5*, Lima, SERNANP, 2013, page 27. This document can be viewed on the website: < <http://www.sernanp.gob.pe/documents/10181/147284/5+Doc+Work+Areas+of+Conservation+Regional+%281%29.pdf/ea712fc6-7e14-459c-b281-06007aa7aa702>>>

Figure 4.4.1. Map of Natural Protected Areas (ANPs) in San Martin.



Ucayali has three National Parks, shared other departments, two Communal Reserves, equally shared, and a Regional Conservation Area. The SERNANP website contains a map of the various PNAs established in the country.⁶³

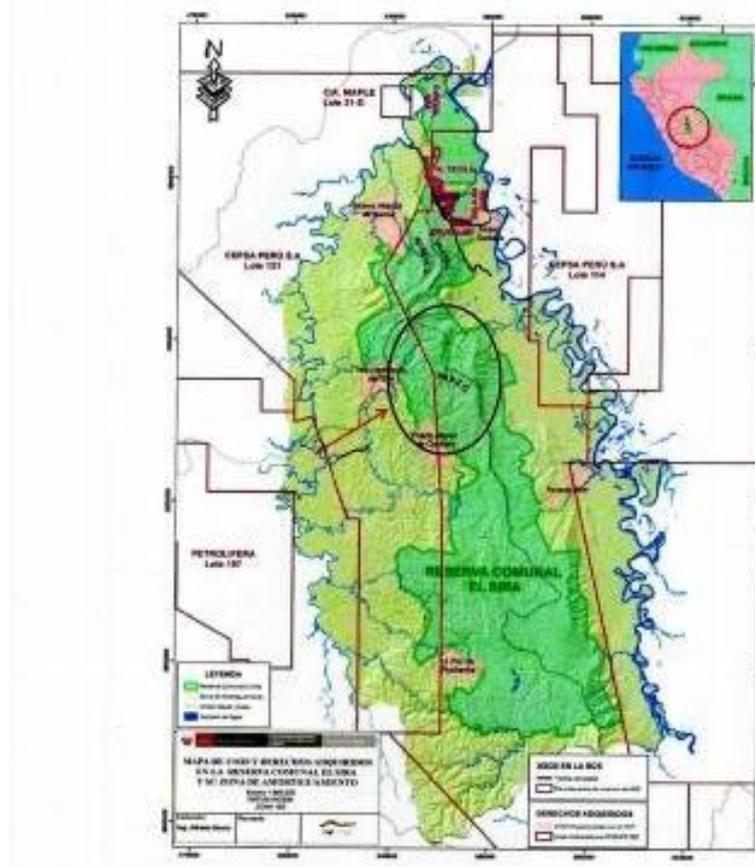
- Cordillera Azul National Park, created in May 2001, by Supreme Decree No. 031-2001- AG, with 1,353,190 ha, in the departments of Ucayali, San Martín, Loreto and Huánuco.
- Alto Purús National Park, created by Supreme Decree No. 040-2004-AG, in November 2004, in the departments of Ucayali and Madre de Dios, with 2,510,694 ha.
- Sierra Del Divisor national park, created by Supreme Decree No. 014-2015-MINAM in November 2015, with 1,354,485 ha, between Ucayali and Loreto. In its interior are located Asháninka and Shipibo-Conibo communities, as well as Isconahua Indians in voluntary isolation.
- The Imiria Regional Conservation Area was created by Supreme Decree No. 006-2010- MINAM in June 2010, with 135,737 ha.
- El Sira Communal Reserve, created by Supreme Decree No. 037-2001-AG, in June 2001, located between Huánuco, Pasco and Ucayali, with 616,413.41 ha.
- Purus Communal Reserve, created by Supreme Decree No. 040-2004-AG, in November 2004,

⁶³ Retrieved from <<http://www.sernanp.gob.pe/documents/10181/165198/MAPA+ANP+25-10-2018.pdf/06b30e24-3e5b-404c-9874-a3e6f71fab2e>>>

between Ucayali and Madre de Dios, with 202,033.21 ha.

The Master Plan of the El Sira Communal Reserve 2015-2019 ratifies the Buffer Zone established by Presidential Resolution No. 044-2009-SERNANP (published on June 3, 2010 in the Official Journal El Peruano). This zone is located "in the provinces of Puerto Inca, Satipo, Oxapampa, Coronel Portillo and Atalaya, in the departments of Huánuco, Junín, Pasco and Ucayali, respectively"⁶⁴. As can be seen in the attached map, taken from the same source, the area covered by the Buffer Zone is quite wide.

Figure 4.4.2. Map of El Sira Communal Reserve located partially in Ucayali.



Forest Lands

According to data from the National Institute of Statistics and Informatics, in the three natural regions of Peru there are more than 72 million ha of forests, of which 68,188,726 ha are found in the Amazon.⁶⁵ In terms of forest regulation, it is estimated that there are 17.5 million ha of permanent production forests, with potential for the use of timber resources and 2.6 million ha correspond to forests for the use of forest products other than timber, such as conservation, and ecotourism, among others.

According to information provided by SERFOR, as of February 2018 there are 1,714 non-timber

⁶⁴ *Master Plan for the El Sira Communal Reserve 2015-2019*, approved by Presidential Resolution No. 134-2015- SERNANP of 15 July 2015. p.36 http://old.sernanp.gob.pe/sernanp/archivos/biblioteca/planes_maestros_2015/sira/Plan%20Maestro%202015%20-%202019%20RC%20El%20Sira%20ver%20aprob.pdf

⁶⁵ Taken from the *National Strategy on Forests and Climate Change*. Lima, 2016. p. 22.

concessions, representing 70% of the total, and 718 timber concessions throughout the country.⁶⁶ Eight per cent of timber concessions are located in Ucayali (183 concessions) and 2% in San Martín (39 timber concessions), according to the same source.

The information from the National Forest Conservation Program (PNCB), for its part, reports, in 2017, the existence of 507,893 ha of timber concessions in San Martín, leaving a total of 797,544 ha of non-concessioned forests. Of these, 326,570 ha are maintained as Permanent Production Forest.

In Ucayali, timber concessions in 2017 totaled 2,683,709 ha, also according to the PNCB. The non-categorized forests in that department totaled 794,731 ha, of which 736,888 are Permanent Production Forests.

According to the Forestry and Wildlife Law, harvesting rights to permanent production forests may be granted to individuals through concessions, which may be for timber, ecotourism, conservation, for non-timber products, wildlife management, and for forest plantations. However, concessions do not grant ownership over the lands or their forests, which belong to the State.

Forest concessions for timber purposes, as well as concessions for forest products other than timber, are normally valid, according to the Forestry and Wildlife Law, for up to forty years, and are renewable, thus generating stability to the holders of such concessions. In the case of indigenous communities, they do not require major formalities for customary harvesting, but if they wish to harvest timber or non-timber forest products, they must present and obtain approval of their forest management plan, as in the case of other forest concessionaires.

It should be noted that partly due to changes in forest legislation, but also due to non-compliance with the obligations of the concessionaires, many forest concessions have become obsolete, or are in suspension.⁶⁷

Deforestation and land use change

The continuous migration to the Amazon region and the growth of the agricultural frontier in recent decades is strongly associated with deforestation and degradation of the Amazon forests. For many years, perverse incentives for deforestation existed, which established land clearing and productive use (crops or livestock) as conditions for obtaining legal land titles, even though the land was classified for forestry or protection.

Since 1978, when the Indigenous Communities and Agrarian Development Law of the High and Low Jungle was approved, land rights should be based on the highest capacity of use of the land, in order to avoid the titling of lands whose highest capacity of use is forestry or protection. However, problems with the application of this concept have contributed to the deforestation of more than 7.3 million hectares of the Peruvian Amazon. This situation changed with the approval of the current Forestry and Wildlife Law, in July, 2011.

This situation is recognized by the National Strategy on Forests and Climate Change, which focuses on the Amazon rainforests "because: (i) it comprises the largest area of forests in the country; (ii) it is the

⁶⁶ Updated 23.02.2018. Can be seen in: <-

=<http://appweb.serfor.gob.pe/ConcesionesForestales/Default.aspx>- Proudly Presents

⁶⁷ < <https://www.serfor.gob.pe/wp-content/uploads/2016/03/Cuadro-Concesiones-Forestales-con-Fines-Maderable.pdf>>

biome where the largest amount of forests is lost annually through slash-and-burn, thus the largest source of GHG emissions; and (iii) it is the home of human populations that depend directly on forests and are highly vulnerable to the effects of climate change, such as indigenous peoples in isolation and in initial contact". The same source states that "the LULUCF sector is responsible for 51% of the country's total greenhouse gas emissions, due to the conversion of forest or protective land for agricultural use and other activities linked to the LULUCF sector."

Poverty in the rural Andean region continues to be one of the main causes of expulsion of its population, especially young people, who seek better alternatives by migrating to the Amazon region. This migration often generates tensions with the indigenous populations and also contributes to land speculation, generally associated with road construction, illegal logging, the production of illicit crops and illegal mining, all of which cause deforestation. In not a few cases, these forms of land occupation are carried out violently, while authorities are unable to manage or sanction these illegal practices, whether due to a lack of resources (material and human), the existence of networks of corruption, the lack of clearly established rights (especially in the case of production forests), and the existence of legal loopholes. Data and discussion of drivers of deforestation in the accounting area and in the Peruvian Amazon in general are found in section 4.1.

Land tenure challenges

The recognition of land rights is complex. In spite of the existence of norms and institutions in charge of the formalization of property, a number of difficulties remain.

On the one hand, legislation and public institutions have undergone numerous and continuous modifications since the beginning of the 1990s. These changes make it difficult to constantly update the general population and negatively affects the application of these changes by officials in charge. This has been compounded by the transfer of the approval of rules and procedures from MINAGRI to the Ministry of Housing, Construction and Sanitation and back to MINAGRI, while the responsibility for implementing formalization has been transferred to the regional government.

The lack of definition of property rights, mentioned in previous pages, also leads to problems of invasion by migrants and others, of lands belonging to farmers and especially indigenous communities. Invasions by informal loggers of community lands are also frequent, which has led more than once to violent conflicts, sometimes with the complicity of local authorities. These problems are difficult to solve, which facilitates the action of speculators, precisely because of the lack of definition of rights over those lands, their oftentimes difficult access, and the lack of public entities in charge of solving those problems. Special mention must be made of the issue of the granting of certificates of possession by local governments, which, due to the lack of adequate regulation, often fuels conflicts.

There are different mechanisms for resolving disputes and conflicts. Given that the main claim of farmers and indigenous communities is the lack of legal security, the Public Investment Project "Cadastre, Titling and Registration of Rural Lands in Peru, Third Stage - PRT3, is being executed. Its goals consider the formalization of the ownership of 403 indigenous communities, 190 peasant communities and 283,400 individual rural properties in 10 departments of the country, including San Martín and Ucayali. In addition, different titling programs have been operating in the Amazon region for some years, supported by multilateral entities and international cooperation, such as PNCB, FIP, IDB, BMZ, NORAD, among others. This is expected to reduce a source of frequent disputes.

On the other hand, the need to strengthen the capacities of the forestry authority, both at the national and regional levels, to not only supervise but also sanction violations of the Forestry and Wildlife Law must be recognized.

If disputes escalate and become conflicts, the authorities in charge of resolving those conflicts will be the civil or mixed judges in their respective jurisdiction. However, it should be remembered that alternative dispute resolution mechanisms are in force in the country, such as extrajudicial conciliation and arbitration, created precisely to resolve more efficiently, quickly and definitively conflicts that, if taken to the Judicial branch, would take several years to resolve. It should be noted that within the scope of the RTPT3 project, the intervention of indigenous organizations represents an enormous advantage in finding conciliation-type solutions that put an end to possible conflicts.

The titling of indigenous communities also continues to be a concern, on the one hand due to unsatisfied social demands and on the other in that these lands serve as sources of land-use related conflicts. It should be pointed out that the titling of communities, especially indigenous communities, is complex due to the number of steps that must be followed, their complexity (such as soil classification), and the intervention of different public entities, including those belonging to different ministries. In the case of campesino communities, discrepancies about boundaries can delay resolution for years.

Before titling their land, indigenous communities are required to obtain administrative recognition, which involves a complex series of steps. The Regulation of the Law of Indigenous Communities and Agrarian Development of the Regions of Low and High Jungle deals very briefly with the procedure of delimiting and titling these territories. As a result, a significant number of ministerial resolutions have been issued by the Ministry of Agriculture and Irrigation which are difficult to implement, such as the "Guidelines for the implementation of the process of agrological evaluation of the lands of native communities and classification by their capacity for greater use at the level of Groups" and "Guidelines for georeferencing the territorial demarcation plan of titled native communities".

The complexity derived from the current institutional and forestry framework has made the procedures for the demarcation and titling of native communities even more complex, since they involve not only the Regional Agricultural Directorates (DRA) of the regional governments, but also SERFOR, SERNANP and DGAAA, entities belonging to different Ministries.

One issue that generates discussion is the legal distinction of the Forestry Law that only recognizes property rights to the community over the area of agricultural use; on lands suitable for forestry, only contracts of cession in use are granted, since these lands are considered patrimony of the Nation. Another aspect that hinders the titling of communal lands is their overlap with Protected Natural Areas, Permanent Production Forests and forest concessions.

In this context, results or lessons learned from the land recognition and titling under the FIP Global Dedicated grant Mechanism for Indigenous Peoples and Local Communities (DGM-Saweto project) (page 24), and the Land Titling and Registration Program (PTRT3) include the following:

The first and most important is that maintaining a good relationship with regional indigenous peoples' organizations, is essential, as this facilitates the process, avoids or reduces the risks of conflicts between communities and gives greater confidence to the communities. As mentioned above, a good working relationship between the indigenous representatives, the financial administrator, and the regional government can accelerate and reduce the costs of the land titling process.

The second has to do with the need to improve relations between the various ministries, in particular the Ministry of Agriculture and Irrigation, which is the governing body for rural property sanitation procedures, and the Ministry of Environment, through which several of the funds for forest conservation

and communal land sanitation were channelled. In addition, there is a need to revise and simplify the procedures for recognition, delimitation and titling of indigenous communities.

These land ownership conflicts could be eased by having a rural land cadastre that integrates not only registered property rights, but also other rights, such as cession in use, forest concessions, mining concessions, among others, and that is permanently updated. The simplification of the procedures for the recognition of indigenous communities and, above all, of the administrative procedures for the demarcation and titling of these communities is something that cannot be postponed, despite its complexity, since it goes against the recognition of its importance under the constitution.

Strengthening regional forest authorities would also prevent some of these conflicts and corruption. Finally, the re-establishment of agrarian and environmental specialty in the different laws courts of the country could help to adequately resolve many of the disputes and conflicts over land, given that they are currently resolved by civil law judges who are not trained in specialized subjects related to agrarian, forestry and environmental legal issues.

Consensus is also need among the different actors regarding the treatment of Proofs of Possession currently granted by regional and local governments. This should include clear procedures for the registration, systematization and transparent articulation of the *constancias* granted in the integrated rural cadastre.

4.5 Analysis of laws, statutes and other regulatory frameworks

Although Peru is not a major contributor to global greenhouse gas emissions, deforestation of its Amazon region is a subject of national as well as international concern, since the region accounts for the majority (51%) of national greenhouse gas emissions and has a rich, but threatened, biological and cultural diversity. Recognition of this situation, as well as Peru's participation in international commitments to prevent further deterioration of the environment (such as the United Nations Framework Convention on Climate Change - UNFCCC), have resulted in the evolution of the country's legal and policy framework related to deforestation, ecosystem services, and climate change.

The national regulatory framework

Peru's political constitution states that every person has the right "to enjoy a balanced and adequate environment for their development" (article 2, paragraph 22) and adds that "The State determines national environmental policy... and ...promotes the sustainable use of its natural resources" (article 67), a declaration that is complemented by specific mention of the Amazon "The State promotes the sustainable development of the Amazon with adequate legislation" (article 69).

The Organic Law for the Sustainable Use of Natural Resources (Law No. 26821) develops a series of general norms for the sustainable use of natural resources, declaring as its objective "to promote and regulate the sustainable use of natural, renewable and non-renewable resources, establishing an adequate framework for the promotion of investment, seeking a dynamic balance between economic growth, the conservation of natural resources and the environment and the integral development of the human person" (article 2).

The environmental regulatory framework is complemented by the General Environmental Law, No. 28611, which in Article I states that "Every person has the inalienable right to live in a healthy, balanced and adequate environment for the full development of life, and the duty to contribute to effective management and protection of the environment, as well as its components, particularly the health of people individually and collectively, the conservation of biological diversity, the sustainable use of natural resources and sustainable development of the country".

In addition to these general norms, there are State policies approved by the National Agreement, the forum that brings together the country's authorities, political and social organizations, which aspires to define broad agreements that transcend governments and become general State policies. Thus, in State Policy No. 19, the National Agreement proposes to integrate national environmental policy with the country's economic, social and cultural policies, in order to contribute to overcoming poverty and achieving sustainable development in Peru.

Equally important, and also at a general level, is the Bicentennial Plan: Peru to 2021, which among the national objectives includes achieving sustainable use of natural resources and an environment that contributes to a good quality of life for people. This instrument seeks to ensure that economic activities are carried out in the best environmental conditions possible with modern technology, and at the same time it proposes to take advantage of biodiversity and renewable resources to promote the development of new economic activities with high added value and sustainability.

Another general instrument is the National Environmental Policy, whose objective is to improve people's quality of life, guaranteeing the existence of healthy, viable and functional ecosystems in the long term and the sustainable development of the country. It considers four thematic axes: (i) conservation and sustainable use of natural resources and biological diversity; (ii) integrated management of environmental quality; (iii) environmental governance; and (iv) international environmental commitments and opportunities.

The National Environmental Action Plan is derived from the objectives of the National Environmental Policy, and emphasizes the prevention, protection and recovery of the environment and its components, conservation and sustainable use of natural resources in a responsible manner and consistent with respect for fundamental human rights.

The National Forestry and Wildlife Policy, for its part, develops the functions and responsibilities of all levels of government (national, regional and local) and public and private actors with respect to forest and wildlife management and establishes corresponding policy axes.

The legal and policy instruments mentioned above are complemented by laws that address more specific issues. The most important ones are mentioned below.

The Law of Protected Natural Areas, Law No. 26834, defines the different categories of ANPs, establishes the national system of protected natural areas, as well as regional and private areas. In general, the Law regulates public use, the use of resources in protected areas, and the establishment, planning, and participation processes, among others. This law is of special importance for the ANPs located in the accounting area.

The Law of Conservation and Sustainable Use of Biological Diversity, Law No. 26839, deals with the conservation of biological diversity and the sustainable use of its components, and promotes the conservation of ecosystem biodiversity, fair and equitable participation in the benefits derived from the use of biological diversity, and the contribution of biological diversity to the economic development of the country. This law provides legal backing for the rights of indigenous communities to their knowledge, practices, and innovations associated with biological diversity and their use by others.

The Ecosystem Services Compensation Mechanisms Act, Act No. 30215, promotes, regulates and supervises compensation mechanisms for ecosystem services derived from voluntary agreements that establish conservation, recovery and sustainable use actions to ensure the permanence of ecosystems, and is applicable to natural or legal persons, both public and private. Under this law, the rights of property owners or usufruct holders of forest resources also include rights to ecosystem services and includes the eventual possibility of benefiting from the emission of certificates of Voluntary Emissions Reductions (VERs). The law, however, requires more precise regulations regarding these rights (see also section 17.2).

More recently, the country approved the Framework Law on Climate Change, Law No. 30754, which establishes general provisions for coordinating, designing, executing, monitoring, evaluating and disseminating public policies for the comprehensive, participatory and transparent management of climate change adaptation and mitigation measures, in order to reduce the country's vulnerability to climate change and take advantage of low-carbon growth opportunities. This law, whose regulation is in the process of being drafted, incorporates climate change into development planning at all three levels of government.

Under the general Organic Law for the Sustainable Use of Natural Resources, various laws define the use of specific natural resources: the General Mining Law (Legislative Decree No. 109), the Hydrocarbons Law (Law 26221), the Water Resources Law (Law 29338), the Private Investment Law for the development of economic activities on national territory lands as well as those of peasant and native communities (Law 26505), and the Forestry and Wildlife Law (Law 29763), among others.

The Forestry and Wildlife Act, No. 29763, and its regulation have been the result of a broad participatory process. The Act defines its purpose as promoting the conservation, protection, increase and sustainable use of the forest and wildlife heritage within the national territory. The law recognizes the multiple uses of forests, including goods and services (including ecosystem services) and their various users, that is, indigenous peoples and other traditional users of forest and wildlife resources, as well as other economic actors. In addition, the law regulates zoning processes and forest management, the assignment of rights to forest users in forests under the public domain, respect for the rights of indigenous peoples, as well as those of the owners of properties with forests, and establishes the obligatory nature of management plans, while defining a new forest institutionalality and mechanisms for inspection and control. The Forestry and Wildlife Law also promotes reforestation, but seeks to avoid reforestation at the expense of standing forest. In addition, the Law permits the establishment of local forests with the objective of providing a legal basis for the sustainable, commercial use of local forests by local inhabitants.

Additionally, there are laws related to specific actors. The Native Communities⁶⁸ and Low and High Jungle Agrarian Development Act, No. 22175, seeks to establish an agrarian structure for the lowland and high jungle regions that contributes to decent standards of living of their populations and the integral and

⁶⁸ It should also be noted that there is special regulation for indigenous peoples, who in Peru are recognized as native communities and peasant communities.

integrated use of renewable natural resources, in accordance with regional development plans. In its first part, it recognizes the existence of indigenous communities, as well as their organization and rights, particularly over their territories, the rights to land ownership for agricultural and livestock use, and the right of cession of use of forested areas. It should be noted that when rights of cession of use are granted via a contract to a community, this does not confer property rights over the land to the community (i.e. although indigenous communities have cession of use rights to forests found in their territories, they do not have property rights to the forests).

The General Law of Peasant Communities (Law No. 24656) defines the character of these traditional organizations, their organization, their rights and the possibilities of the development of economic activities within them. This law was complemented by the Act on the Demarcation and Titling of the Territory of Peasant Communities (No. 24657), which established simplified mechanisms for the legal titling of their lands. Most of these lands are found in the mountains and the coast, but some peasant communities are found in the Amazon.

The Law of Prior Consultation of Indigenous Peoples (Law No. 29785) is derived from Peru's national constitution, ILO Convention No. 169, and the United Nations Declaration on the Rights of Indigenous Peoples. It established the rights of indigenous and peasant peoples, intercultural communities and Afro-Peruvian peoples to free, prior and informed consultation, through appropriate procedures and prior to agreement or consent, related to State standards, plans and projects. As a result, the application of norms, plans, and programs that affect these peoples must be consulted prior to their implementation.

With regards to the legal framework for governance, it should be recalled that the country's decentralization process has defined three levels of government: national, regional and local. Local government is exercised through provincial municipalities and district municipalities.

The Organic Law of Regional Governments, Law No. 27867, regulates the structure and organization of decentralized governance at the regional level. It seeks to organize the territory and the environment in a sustainable manner, manage natural resources appropriately and improve environmental quality, and to promote inter-institutional coordination and cooperation and citizen participation at all levels of the National Environmental Management System. Among other functions, the Law grants regional governments powers in the area of forest control and empowers them to grant rights of access to forest resources through forest concessions. It also recognizes the rights of the regional governments to provide clear title to rural properties, including those of indigenous and peasant communities.

The Organic Law of Municipalities, Law No. 27972, develops the competencies recognized in the Constitution for (mostly rural) municipalities. The competencies of provincial municipalities include the promotion of the sustainable management of natural resources, soil, water, flora, fauna and biodiversity, with the aim of integrating the fight against environmental degradation with that against poverty and the generation of employment within the framework of consensual development plans.

The Framework Law for the Modernization of the State, Law No. 27658, regulates the process of modernization of State management. It defines as its fundamental purpose the obtaining of greater levels of efficiency of the state apparatus, in all its institutions and entities in order to improve attention to citizens, prioritizing and optimizing the use of public resources.

The new law that regulates the promotion of private investment through Public-Private Partnerships and Assets Projects (Legislative Decree No. 1362) defines Public-Private Partnerships as the joint participation of private investment with State entities in order to develop public infrastructure, public services or projects related to the environment. The Partnership is based on based on long-term contracts between private investors and the State entities involved.

Institutional framework

The Peruvian State has established different entities for the application of the normative framework described above.

The Ministry of the Environment (MINAM) is the governing body of the environmental sector that promotes the conservation and sustainable use of natural resources, biological diversity and protected natural areas. It is the national environmental authority, the national authority on climate change and the technical and regulatory authority at the national level in this area and is the focal point for international negotiations on climate change. It is responsible for proposing technical aspects related to REDD+ and coordinating with relevant national and sub-national (regional), public and private entities. Its scope includes the following dependencies:

- General Directorate for Climate Change and Desertification is in charge of formulating national policy and standards for climate change management, in coordination with the corresponding entities. It is also the National Authority designated to fulfill the commitments assumed in the United Nations Framework Convention on Climate Change.
- General Direction of Territorial Classification and Zoning is responsible for environmental classification, mapping, and zoning.
- General Directorate of Environmental Management, Policies, and Instruments is responsible for designing and formulating the national environmental policy and environmental planning instruments for environmental management. It also elaborates guidelines for the formulation of environmental policies, strategies and plans of a sectorial, national, regional and local nature within the framework of the National Environmental Management System.
- National Forest Conservation Program for Climate Change Mitigation (PNCBMCC), was created with the objective of conserving 54 million hectares of tropical forests, as a contribution to climate change mitigation and sustainable development. It is responsible for the National Action Plan REDD+ and co-responsible with SERFOR for the National Forests and Climate Change Strategy.
- National Protected Natural Areas Service (SERNANP), is the specialized public agency of MINAM whose function is to manage and operate the National System of Natural Areas Protected by the State (SINANPE). It promotes, grants, and regulates rights for environmental and other similar services generated by national protected natural areas.
- Office of Environmental Evaluation and Fiscalization (OEFA), is the governing body of the National System of Environmental Evaluation and Fiscalization. It acts as evaluator, supervisor, inspector and applicator of environmental laws and incentives, according to the environmental regulations established in Law N° 29325, Law of the National System of Environmental Evaluation.
- The Ministry of Agriculture and Irrigation (MINAGRI) is the governing body of the National Agrarian Policy related to resolving physical and legal problems with land titling and the

formalization of agrarian property, including the lands of indigenous communities, peasant communities and private rural properties.

- The General Directorate of Agrarian Environmental Affairs (DGAAA) approves the Environmental Impact Studies of the agrarian sector, carries out environmental audits of agrarian and agro-industrial projects and activities and others related to renewable natural resources within the scope of its competence. It approves the classification of lands according to their greatest use capacity.
- The General Directorate of Legal Titling of Agrarian Property and Rural Land Registry (DIGESPACR) is the technical normative entity involved in the resolution of physical and legal problems with land titling of rural properties, including native and peasant communities. It coordinates this work with the Regional Governments, which are the executors of such processes.
- The National Forest and Wildlife Service (SERFOR), is the governing body of the National Forest and Wildlife Management System (SINAFOR) and the technical and regulatory authority at the national level responsible for dictating standards and establishing procedures related to forests and wildlife.
- The National Agrarian Innovation Institute (INIA) is responsible for promoting national agrarian technological innovation to increase productivity and improve levels of competitiveness, the value of genetic resources, as well as the sustainability of agricultural and forestry production.
- The National Water Authority (ANA) is in charge of carrying out the necessary actions for the multi-sectorial and sustainable use of water resources in watershed, within the framework of the integrated management of natural resources and the management of national environmental quality, in alliance with regional governments.
- The Rural Agricultural Productive Development Program (AGRORURAL) is specialized in combating rural poverty, initially in the Andes, but is in the process of expanding into the Amazon, promoting strategies, activities and mechanisms to improve the income and quality of life of rural families.
- The Agricultural Competitiveness Compensation Program (AGROIDEAS) operates at the national and regional levels, providing resources to support business management, associativity and adoption of technology for sustainable businesses that involve organized, small and medium-sized, agricultural, livestock or forestry producers, to increase their competitiveness and consolidate their participation in the market.
- The Ministry of Culture, through the Vice-Ministry of Intercultural Affairs, is the lead agency for indigenous peoples, responsible for the design and formulation of public policies relating to interculturality. It is the lead agency responsible for prior consultation with indigenous peoples.
- The Ministry of Economy and Finance, through the Vice-Ministry of Economy, is the lead agency in charge of designing and implementing national economic and financial policy in order to achieve economic well-being. The General Directorate for International Economic Affairs, Competition and Productivity is the FIP focal point.
- The Presidency of the Council of Ministers, through the Forest and Wildlife Resources Monitoring Body (OSINFOR), is the body responsible for supervising and overseeing the sustainable use and conservation of forest and wildlife resources, as well as the environmental services coming from forest with rights holders.

At the sub-national level, the Regional Governments work through the following entities:

- The Forestry and Wildlife Management Units (UGFFS) are the regional territorial organizations for the management, administration and public control of forest and wildlife resources and are under the administration of each regional government. The UGFFS can establish community forest management units that include the participation of various actors in their administration.
- The Regional Agrarian Directorate (DRA) promotes agricultural production activities and is the main coordinating body at the regional level of the Ministry of Agriculture and Irrigation. The Agrarian Directorates of the regional governments are also responsible for the implementation of policies related to resolving physical and legal problems with land titling and the formalization of rural agrarian property.
- The Regional Environmental Authorities (ARA) are responsible for specific functions related to the environment, protected areas and land-use planning. They are governed by the provisions of the Environmental Management Law and other instruments that regulate the Regional Environmental System.

5. STAKEHOLDER CONSULTATION AND PARTICIPATION

5.1 Description of stakeholder consultation process

The stakeholder consultation and participation of the ER Program feeds off of multiple process and experiences that are intimately linked in a web of interactions related to REDD+, including the design and validation of the R-PP, PPIA, the preliminary national SESA and ESMF, the National Forest and Climate Change/REDD+ Strategy, the DCI, the NDCs, and the ERPD itself. These experiences have contributed to a high degree of stakeholder capacities to respond adequately during the consultation and validation of the ERPD and to the viability of the ERPD design.

The participation and involvement process began in 2008 in the context of the preparation of the R-PIN, which was formulated with the input of civil society, indigenous organizations, and sector representatives. From 2011 onwards it continued as part of the FIP process and the Readiness and ER-PIN processes, the design and validation of the National Forests and Climate Change/REDD+ Strategy (ENBCC), and the subsequent design and implementation of projects related to REDD+ such as the NDCs, DCI, FIP, and ER Program of the FCPF. During the consultation and feedback process related with the preparation of the REDD+ Readiness and FIP, 40 events were held up to 2014 (23 for the R-PP and 17 for the FIP) and included the participation of more than 1,000 people. The FIP process is relevant for the ERPD because two of its target areas are found in the ER Program accounting area. Between 2014 and the end of 2016, attention turned to the construction and consultation of the ENBCC (including the national REDD+ strategy) and the preparation of the ER-PIN.

These processes included and continue to involve a broad spectrum of civil society, indigenous organizations and the public sector at the national and regional levels and have been carried out in a transparent manner and in accordance with the laws of Peru and the safeguards of the multilateral development banks. They have included the REDD+ Group, composed of various NGOs and academic Institutions, which promotes REDD+ by strengthening capacities, providing information, and formulating policies and a national REDD+ agenda⁶⁹.

⁶⁹ <http://www.gruporedperu.com>

As part of these safeguards, emphasis has been placed on indigenous groups. Numerous consultations have been carried out with the national representations of AIDSESP, CONAP, their regional representatives, local organizations, and other indigenous organizations. In addition, AIDSESP and CONAP are members of the Multi-sectorial Committee and Coordination Group for REDD+ at the national level, as well as the REDD+ and-Indigenous REDD+ Roundtable. The REDD+ Group and Indigenous REDD+ Roundtable are also represented in the Central Coordination Group of the PPIA.

In general, the participation of diverse stakeholders in the ER Program occurs within the legal and institutional framework provided by the Forestry and Wildlife Law via the National Forestry and Wildlife Plan, the national level multi-sector working group for coordination of the Forests and Climate Change Strategy, stakeholder entities associated with the regional governments at the regional level, and the Management Committees for Forest and Wildlife Management at the local level. The umbrella guidelines for the involvement and communication with stakeholders have been developed by MINAM in the Stakeholders' Engagement Plan (PPIA), which has been used to guide the development of the guidelines for the consultation and participation of stakeholders within the ER Program context (Annex 8) and the framework for the participation of indigenous peoples in the ER Program (Annex 9).

With regards to the consultation and participation of indigenous peoples, these processes are conducted in accordance with both national (Law No. 29785) and international regulations (ILO Convention 169), which are oriented towards participation of all citizens, under the principles of good government. Participation and consultation of indigenous peoples are also included in the Amazon Indigenous REDD+ Program (RIA), and the Law of Prior Consultation provides additional guarantees specifically focused on these groups. Stakeholder participation is also envisioned in the emissions management working group of the Commission for Forest and Climate Change Governance.

Stakeholder involvement processes

The REDD+ involvement process is guided by PPIA that was initially formulated in 2013 and used in the FIP process and which was subsequently adapted and actualized for the implementation of REDD+ Readiness in 2014. The current version used during the design and implementation of the ENBCC was modified in December 2017 and continues to evolve and be used in the context of major initiatives related to the reduction of emissions⁷⁰. The PPIA proposes a classification of stakeholders and develops the guidelines for their informed and effective participation in different processes related to REDD+, such as the reference level, SESA, ESMF, the grievance mechanism, and benefit distribution plan, and specific projects such as the DCI, FIP, and ER Program.

The document for participation in the ER Program incorporates the stakeholder classification, typification, and methodologies of the PPIA; it also includes guidelines and methodologies for participation and the chronogram of activities of the ER Program. The objective of the document is to foment inclusive stakeholder participation during the Program cycle.

Within the document on participation, various actors have been identified and characterized based on their involvement and their roles in the Program in order to better define strategies and plans for their participation. The document pays special attention to indigenous groups and establishes mechanisms for the participation of indigenous peoples in decision making processes (see Annexes 8 and 9), including the planning, implementation, monitoring and evaluation, and generation of reports that involve indigenous peoples. It incorporates the principles and guidelines of Program governance which is based on multiple

⁷⁰http://www.minam.gob.pe/cambioclimatico/wp-content/uploads/sites/127/2019/01/PPIA_documento-de-trabajo_03.01.19-1.pdf

levels and sectors, complementarity, transparency and accountability. The document on participation also considers transversal aspects of participation: equity, and Interculturality (see Annexes 8 and 9).

Five processes are included in planning the participation and involvement with stakeholders at both the regional and national levels, with special emphasis afforded to indigenous groups:

- 1. Coordination** with stakeholders, based on stakeholder typology and level of insertion in Program activities, in order to determine actions and convoke the representatives of organizations to meetings and Program events.
- 2. Stakeholder mapping:** The Program has mapped stakeholders in relation to interventions. More local mapping can be carried out when necessary.
- 3. Generation of road maps:** The Program formulates participation plans, in concert with stakeholders that specify the themes to be consulted, the methodologies used, and the places and dates.
- 4. Selection of the methodologies for participation/consultation** (fora, formal meetings, specific or general workshops, etc.), in accordance with the themes, needs, and interests of the stakeholders.
- 5. Chronogram of actions** according to the proposed activities and available budgets.

In order to assure the participation of remote indigenous groups, methodologies adapted from the FIP process and NGOs are being used. These include holding meetings, convoked by the regional organizations of AIDSEP and CONAP and attended by ER Program personnel, in centralized locations accessible to remote indigenous groups and the use of local interpreters and materials produced in local languages.

Participation Spaces

In the REDD+ context, participation spaces have been established with different actors that will be used to support the ER Program participation process:

1. Spaces associated with the strategic management of programmatic interventions, including the Commission on Forest and Climate Change Governance, the Carbon Fund Coordination Group, Regional Coordination Group (Amazon Commonwealth), ER Program coordination unit within MINAM, and Regional Advisory bodies, all within the Program's governance model (see section 6.1).
2. Formal spaces for formal dialogue with the Peruvian State, such as the spaces generated for participation and consultation within the DIALOGUEMOS process, led by MINAM.
3. Spaces associated with the management of protected natural areas, such as the Management Committees of ANPs and spaces associated with the co-management of Communal Reserves.
4. Other spaces are: the National REDD+ Group, the regional REDD+ roundtable coordinated by regional governments; the Amazon Indigenous REDD+ Tables, the regional (CAR) and local (CAM) environmental commissions, the Amazon Interregional Council (CIAM), the Regional Forestry and Wildlife Control and Surveillance groups, the Regional Indigenous Policy Working Groups, and the recently established working groups to promote inclusive low emissions rural development.

At national level, there are also several web sites maintained by government entities or stakeholders that disseminate important information related to the Program:

- MINAM: https://drive.google.com/drive/u/0/folders/1FUDY7HPnNq-ddMvYJXwtDU1IE9adX_xG
- <http://www.minam.gob.pe/cambioclimatico/salvavidas-redd/>
- Forests in your hands: <http://www.bosques.gob.pe/>

- MINAM DCI: <http://www.minam.gob.pe/cambioclimatico/dci/>
- UNFCCC REDD+: <http://redd.unfccc.int>
- UN REDD+: <http://www.un-redd.org/>
- FCFP: <https://www.forestcarbonpartnership.org/peru>
- CIF: <http://www.climateinvestmentfunds.org>
- AIDSEP: <http://www.aidsep.org.pe>
- CONAP: <http://www.conap.org.pe/>
- WWF: http://www.wwf.org.pe/nuestro_work/forests/
- CIFOR: <https://www.cifor.org/library/4226/>
- CIMA: <http://www.cima.org.pe/es/sobre-nosotros/quienes-nos-apoyan>

Program Stakeholders (stakeholder mapping)

Following the typology of the PPIA, the document on participation proposes the following classification of actors:

1. Actors whose livelihoods depend directly or indirectly on forests
2. Actors with specific competencies in forest governance, administration, management and control
3. National and international cooperation
4. Private sector actors, and their organizations, whose economic activity is directly or indirectly related to forests and REDD+.
5. Academic and/or research institutions in the area of forest conservation and REDD+.

For a more detailed list of the program stakeholders, please see Table 8 in Annex 8. The mentioned table includes the stakeholder typology and its correlation with the different identified relevant groups of actors, specifying its institution and location.

In general, actors whose livelihoods depend on forests are mostly vulnerable populations including indigenous populations, women, small farmers, or migrants. Contacts with these groups will use the following guidelines:

- An early relationship will be established with representative indigenous organizations at the national level, in order to identify and work, through them, with their local affiliates.
- In the case of women, in addition to national indigenous organizations, regional and local organizations have representatives or offices, which will be convened directly at meetings and workshops.
- In relation to farmers and migrants, due to the fact that they are individual, territorially dispersed, and with little formal organization, work with these groups will be carried out through regional and local governments (municipalities) and development projects that include them as participants. In addition, MINAM will review past experiences for working directly with these participants.

Priority themes for stakeholder consultation

Within the DPIA, consultations identified seven overarching themes requiring further development, coordination, and consultations:

1. **Intervention targeting**, including specific groups of actors and geographic locations.
2. **Governance and coordination**, especially at the regional and sub-regional levels (see section 6.1).
3. **Benefit-sharing**. The Plan is in the initial design phase (see section 15).

4. **Non- carbon benefits**, especially their validation and plans for local monitoring.
5. **Citizen Attention Mechanism (MAC)** / complaint resolution mechanism, which has been designed to work across all the Program's themes. This mechanism is in the design phase (see section 14.3).
6. **Safeguards**. The design of the ER Program safeguards and their information system are in the initial phase, and will be included in the Program roadmap.
7. **Community monitoring**. Within the context of the Program, participatory monitoring is critical for periodic evaluation of Program activities or impacts related to local forest use, application of safeguards, co-benefits, and distribution of benefits. Community monitoring design is also at an early stage.

The relevance of these themes for specific stakeholder groups is shown in the Table below.

Table 5.1. Actors and preponderant themes of participation

Actors	Themes				
	Interventions	Governance	Distribution of benefits/ Non-carbon benefits	Safeguards and MAC	Participatory monitoring
Indigenous Organizations and/or CCNN	X	X	X	X	X
Competent authorities and government programs	X			X	X
Regional and Local Governments	X	X	X	X	X
Project and NGOs	X			X	X
Businesses, cooperatives, producer associations and individual producers	X			X	X
Academy, national institutions and universities	X			X	X

Participation methodologies

The working methodology related to participation in the ER Program is adopted from the national process called Dialoguemos, which is led by MINAM. This is a multi-actor and multilevel participatory format that seeks to contribute to the implementation and socialization of climate change management through: 1) permanent interaction, and 2) alliances and agreements between actors. This is also the country format for REDD+ actions. The most common participatory mechanisms used include: meetings, fora, working meetings, and executive breakfasts, according to the objective and interest group. Additionally, the ER Program considers the following methodologies (For more details see Table 3.7 in Annex 8):

- **Meetings**. This methodology gives greater importance to socialization, presentation of program characteristics, scopes, co-benefits, etc. It includes presentations, work tables and spaces for generating discussion.
- **Workshops**. Workshops are carried out with key actors in order to reach consensual agreements. Program leaders at meeting venues at the request and analysis of the various actors.
- **Strategic meetings**. These are strategic and are usually focused on strategic institutional actors, themes, and needs, e.g. direct institutional collaboration arrangements during the implementation of the Program.

- **Individual interviews and consultations.** This mechanism is used to directly identify interests and recommendations of certain individual actors. It can be used in the event that some of the actors are unable to **participate** in the workshops or meetings.
- **Language.** The workshops will generally be conducted in Spanish, and depending on the case (indigenous population) will be supported by specialized local interpreters. When printed materials are used, they are usually translated into the predominant indigenous language of the participants.

Other supporting methodologies are mentioned in Table 5.1.2 below.

Table 5.1.2. Methodological support tools for stakeholder participation

Type of actor	Methodological tools
Indigenous communities and organizations	Face-to-face meetings and workshops. Written announcements Materials: Graphic primers in Spanish or translated according to ethnicity, with culturally appropriate designs and illustrations, use of flipchart paper, pens and cards. Videos, photographs and/or role playing. Use of verbal maps, artistic expressions, models, etc. Visualization of the objectives and the program in printed form. Facilitators, moderators, or interpreters.
Relevant sectors, government programs, regional and local governments	Face-to-face meetings and workshops. Written and/or virtual announcements. Include the program of the event and information. Materials: Cards and pens. Use of maps, videos and photographs. Independent facilitator or moderator.
Project implementers, donors and NGOs	Meetings (face-to-face and/or virtual) Executive breakfasts. Written and/or virtual announcements. Include the program of the event and information. Materials: Cards and pens, internet. Use of virtual questionnaires, maps, videos and photographs. Evaluate the use of a virtual platform, if applicable.
Businesses, cooperatives, producer associations and individual producers	Face-to-face meetings and workshops. Written and/or virtual announcements. Include the program of the event and information. Materials: Cards, stationery, pens, maps. Use of questionnaires, videos and photographs. Evaluate the use of a local facilitator.
Academy, national institutions and universities	Meetings and workshops (face-to-face and/or virtual) Written and/or virtual announcements. Include the program of the event and information. Materials: Cards and pens, maps, internet. Use of virtual questionnaires, videos and photographs. Evaluate the use of a virtual platform, if applicable.

Informative and consultative processes

Besides the more of 100 events related to the preparation of the REDD+ Readiness, ENBCC and projects that are part of the ER Program, the ER Program has developed a series of workshops and specific meetings at national, regional and local levels. In order to ground the proposal in the context and regions of the accounting area, a first round of 6 consultations, involving a total of 60 participants, were carried out in San Martín and Ucayali in order to establish the organization during the implementation phase. Moreover, frequent and on-going dialogue by MINAM, CIAM, the Governors Climate and Forest Task Force, the Earth Innovation Institute, and multi-lateral projects such as FIP, DCI, NDCs, and PPS are being held with the San Martín and Ucayali governments in order to improve vertical and horizontal coordination, define regional low emissions development strategies, refine policy instruments, and develop regional government interventions relevant to the ER Program.

Additionally, six meetings were also held between June and December, 2018 for the development of the national safeguards process. These included more than 20 institutions and the participation of indigenous peoples' organizations. During these events the preliminary interpretation of the Cancun safeguards, ESMF, and plan for SIS were presented and feedback obtained.

Table 5.1.3. Stakeholder participation in the initial phase of the ER Program

	Participatory Events	Main Actors	Place	# Participants	Date 2018
1	Initial technical workshop	MINAM, ER Program Technical Team	Lima	10	August
2	Workshop in Ucayali	ERP Technical Team Regional Government (Directorates)	Pucallpa, Ucayali	17	September 21
3	Workshop in San Martín	ERP Technical Team Regional Government (Directorates)	Tarapoto, San Martín	9	September 25
4	Workshop in San Martín	ERP Technical Team Regional Government (Directorates)	Moyobamba, San Martín	14	September 26
5	Working meetings in San Martín and Ucayali	PRE Technical Team, Regional Government Directorates	Pucallpa, Ucayali	10	October
6	Technical workshop	MINAM, ERP Technical Team, World Bank	Lima	15	December 3 - 7
	TOTAL			60	

The first round of workshops and meetings, held in 2018, provided input into the design of the ER Program. A second round of meeting in 2019 was used to gather opinions on the proposal and to help formulate sections in need of greater development, and coincided with the change of government of regional and local authorities. This governmental transition required additional meetings in San Martín and Ucayali to present the ERPD interventions to the recently elected regional government authorities, assure their buy-in, and prepare the next steps for consultations with stakeholders. Themes related to financing and the sustainability of the interventions were also discussed.

In addition to the work with the regional governments, the second round of consultations was very productive due to the opinions, ideas and/or conformity obtained from stakeholders. The consultations emphasized the important points of the ERPD, including those in need of further development, and used a specific methodology (see Annex 10 for the methodology of the workshops, the lists of participants and systematization of the meetings).

The 2019 communication, participation and consultation process is summarized in the Table below.

With regards to information dissemination, spaces for the diffusion of Program-related activities will be coordination with the regional governments. Other periodic communications will present themes of interest to participants, taking into consideration that the communication will facilitate the access and understanding of those involved, with special emphasis on indigenous peoples. Audio or graphic media or videos in indigenous languages will be used when needed. These communication actions will complement those used by the MAC (see section 14.3).

Table 5.1.4. Stakeholder consultations during 2019

Event Type		Main Actors	Place	# Participants	Date 2019
1	Working meetings	MINAM, Regional Government	Pucallpa, Ucayali	10	January 15
2	Working meetings	MINAM, Regional Government	Pucallpa, Ucayali	10	February 6
3	Business meetings	MINAM, Regional Government	Tarapoto, San Martin	28	February 7
4	Working meetings for the presentation of the ERPD	MINAM, World Bank, TAP Team, consultants, representatives of Regional Governments of San Martin and Ucayali, representatives of indigenous organizations.	Lima	35	February 11-15
5	Consultative Regional Workshop	Multiactor ⁷¹	Moyobamba, San Martin	56	March 7
6	Local Consultative Workshop	Multiactor	Lamas, San Martin	28	March 8
7	Regional Consultative Workshop	Multiactor	Pucallpa, Ucayali	36	March 11
8	Local Consultative Workshop	Multiactor	Atalaya, Ucayali	45	March 12
9	Local Consultative Workshop	Multiactor	Padre Abad, Ucayali	47	March 12
10	Information feedback workshop	Multiactor	Pucallpa, Ucayali	17	March 13
11	Working meetings	MINAM, Regional Government	Pucallpa, Ucayali	8	May-23
12	Consultative projects' Workshop	ER Program projects	Pucallpa, Ucayali	15	May-23
13	Local Consultative Workshop	Multiactor	Pucallpa, Ucayali	21	May-24
14	Working meetings	MINAM, Regional Government	Moyobamba, San Martin	4	May-27
15	Local Consultative Workshop	Multiactor	Moyobamba, San Martin	17	May-28

⁷¹ Multiactor includes the groups mentioned in Table 5.1.1

16	Consultative projects' Workshop	ER Program projects	Lima	11	May-29
	Total	16		388	

5.2 Summary of the comments received and how these views have been taken into account in the design and implementation of the ER Program

The participation and consultation processes described above, including the SESA of the ENBCC, the prioritization of REDD+ activities, the national interpretation and information summary of the Cancun safeguards, generated many comments from stakeholders, especially from the FIP, NDCs, DCI, and the ENBCC/REDD+ processes and more recently from the ER Program consultations itself. All these projects have received comments, observations, and suggestions originating from the workshops, technical meetings, and coordination sessions. Various themes have been repeated across projects and in the ER Program meetings.

Table 5.2.1 presents a summary of common themes among actors and the manner in which they have been used to develop the ER Program.

Table 5.2.1 Summary of comments received and taken into account in the design of the ERPD.

Origen of Comment	Comment/observation	Relevance for ER Program
Indigenous groups	<p>Regarding land titling:</p> <p>Include participation of various ministries, especially MINAGRI, because land titling funds are often used to favor migrants and land speculators.</p> <p>Consideration of all phases of land titling included land classification, zoning, and titling, as well as the expansion of indigenous territories.</p> <p>Many areas in San Martín have acquired <i>de facto</i> rights that should be recognized.</p> <p>When the increase in indigenous territories is contemplated, a conflict resolution mechanism may be necessary.</p> <p>The georeferencing of indigenous communities needs to be updated.</p> <p>Community control and vigilance is needed at the regional level and within indigenous communities or concession areas that these communities manage.</p> <p>Traditional indigenous knowledge should be incorporated, as well as the rights of indigenous peoples to maintain their traditional life styles and collective territorial property.</p> <p>Microzoning is needed.</p> <p>Need to increase the geographic focus of the FIP Program.</p>	<p>Interventions aimed at reducing land speculation are included in the ER Program. In general, the ERPD will improve institutional enabling conditions, especially those aimed at land classification, zoning and titling, and the monitoring, control, and enforcement of land and natural resource use. Within these interventions special attention will be paid to indigenous needs: land titling programs will assign priority to indigenous groups in intervention areas; indigenous community monitoring of forests (<i>veedurias y custodios forestales</i>) and lands will be incorporated into the monitoring mechanisms; more information will be provided to communities or generated by them in order to improve community governance of these resources; and community planning, decision making, and monitoring will be improved via training.</p> <p>The ER Program will complement the geographical coverage of the FIB by including entire regions of San Martín and Ucayali in the accounting area.</p>
Producers	<p>In order to avoid perverse and undesired results, the strengthening of producers should consider the</p>	<p>The ER Program links increased production with forest conservation via the conditioning of incentives and assistance to</p>

	<p>potential impact on deforestation and be done within the context of forest conservation.</p> <p>Initiatives related to biocommerce should be identified and strengthened.</p> <p>Reforestation with commercial and non-commercial species should be contemplated.</p> <p>The contribution of small farmers to GHG emissions needs to be better defined.</p>	<p>the latter, as well as the use of branding based on reduced deforestation.</p> <p>The intervention on sustainable community forestry includes the organization of producers of non-timber or secondary forest products as well as the strengthening of market linkages for these products.</p> <p>The reforestation of commercial species by businesses and small producer groups is included in the ER Program interventions.</p> <p>The contributions of small farmers to GHG emissions due to deforestation is relatively well-defined. However, more information is needed on the impact of land speculators and recent migrant farmers and small farmers/loggers with respect to forest degradation.</p>
<p>Local and regional governments</p>	<p>The principles of good governance, strengthening transparency, effective participation, and inter-sectorial and multi-level coordination should be incorporated.</p> <p>The role of local and regional governments in implementation should be made more visible via the articulation of existing regional instruments.</p> <p>Principal risks such as the scarce articulation among institutions involved in forest conservation and the limited political will to implement effective actions related to reducing deforestation should be addressed.</p> <p>The regional governments have significant technological, legal, information, and management gaps and needs. These need to be addressed by the interventions.</p> <p>There are scarce human resources for the implementation of safeguards in San Martin and municipalities often do not incorporate territorial safeguards. Great civil society participation is needed.</p> <p>From the regional government perspective, principal barriers include the lack of articulation between the different levels of government, finances, and social conflicts.</p> <p>Regional government representatives commented that deforestation and agricultural statistics do not agree. Information needs to be updated.</p> <p>Both regional governments consider that the development of regional branding and measures such as monitoring and control are necessary in order to combat deforestation.</p>	<p>A large part of the ER Program interventions are dedicated to improving institutional enabling conditions including: policies, sectorial and multi-level coordination; land classification, zoning, and titling; land use monitoring, control, and enforcement; the accessibility and dissemination of information for decision making; and institutional resources and capacities. In these areas, special emphasis is placed on regional governments, due to their important role in the implementation and monitoring of the interventions.</p>

Other actors	<p>Formal mechanisms for access to public information are needed. Information should be inter-cultural, updated periodically, should enable downloading and editing, and periodically updated.</p> <p>Information and protocols related to effective participation need to be organized.</p> <p>A mechanism for feedback and articulation among institutions is needed.</p> <p>Results monitoring is needed.</p> <p>Ecosystem services should be compensated (e.g. water payments in Tarapoto organized by CEDISA and the TDCs of the PNCB).</p> <p>Incentives should be tied to desired results in order to avoid perverse impacts.</p>	<p>The gathering, use, and dissemination of information is one of the principal enabling conditions that will be strengthened by the ER Program. Specific thematic areas for the strengthening of information gathering, use, and dissemination include: agricultural and other land use; forestry management plans, timber production and traceability; market intelligence for agricultural and forest-related products; technical information related to agricultural, forestry, and forest plantation management; attitudes and needs of stakeholders. Frameworks for information gathering and dissemination include the feedback and grievance mechanism, the PPIA, multi-stakeholder platforms such as the Public-Private Coalition and REDD+ Roundtables; and various governmental web pages related to the ER Program, deforestation, and emissions reductions.</p> <p>The Program contemplates a number of non-monetary incentives that are conditioned upon forest conservation and aligned with regional branding. These include: access to technical assistance and more accessible credit, the establishment of economic identities, improved productive infrastructure, and prioritization in cession of use contracts and land titling. It also includes results-based payments for forest conservation, such as the TDCs.</p>
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These direct inputs contributed to the development of the interventions, the contextualization of their environmental and social impacts, a deeper understanding of the particularities of the regions, the perception of the stakeholders related to deforestation, and their vision of the challenges related to the implementation of REDD+ programs. They have also provided important inputs related to the interpretation of safeguards and the SIS road map under development by MINAM, and in the road map for the integration of indigenous peoples in the Forest Cover Monitoring Module (MMCB).

During the regional ER Program consultations carried out in 2019, 5 themes were discussed: 1) program interventions, 2) environmental and social safeguards, related to negative impact, risks and mitigation measures, 3) ideas and proposals for the citizen attention mechanism (MAC), 4) governance, and 5) benefit sharing (Table 5.1.5).

The principal comments obtained at these meetings are summarized below: (for more information, see Annex 10 on the systematization of the regional and local workshops).

1. For the Regional Government of Ucayali, it is important that the Program work comprehensively on a family farming approach, as a step toward eradicating poverty and promoting food security. In that sense, they highlight strategic action 2.3 (Strengthen subsistence family agriculture to produce surpluses for markets) as one that will contribute importantly reducing forest loss in the coming years.

2. The Regional Government of San Martín is committed to the "productive revolution", promoting an improvement in the productivity of main crops (palm oil, cocoa and coffee) and their value in all the provinces to the highest possible level. This goal is aligned with strategic action 2.2 (Promote increases in productivity, intensification, quality, and commercial contacts of coffee and cocoa grown in deforested areas). At the highest level, the government also backs an integrated economic development-conservation approach.
3. Land trafficking, lack of access to legal security, overlapping land rights and lack of forest control and monitoring are considered as the main reasons to be addressed within the framework of the ER Program.
4. There is a recognition that some actors are unfamiliar with the concept of the importance of standing forests for economic benefits, with the result that they carry out deforestation.
5. In this context, there is a need to promote activities related to non-timber products and other green activities, in order to increase the value of the natural standing forest.
6. Stakeholders strongly agree on the following: alliances with experts, specific stakeholder mapping, consideration of local monitoring experiences in conservation areas and protection forests, reinforcement of control on roads to avoid illegal timber, and alliances with indigenous populations who are often at a disadvantage with regards to monitoring and surveillance.
7. They also manifested needs related with the use of technology, a family farming approach, infrastructure and equipment for wood processing.

In the case of the multi-stakeholder meetings and workshops held in the San Martín Region, the principal comments included the following:

1. Agreement on the need for a MAC, which is related to the governance proposal and which can also use some existing local models as references.
2. The need to use applications or training in the use of existing virtual portals, in order to avoid having citizens travel to centralized offices, and that the main channel for feedback should be through the regional and local governments. The models or platforms created as a result of the ER Program must be simple and built on existing channels.
3. Citizen regard some organizations, such as the *Defensoria del Pueblo* (public ombudsman office) highly, while the opinion of others, such as forest concessions, is more critical.
4. There is no social mechanism at the level of project management monitoring, except in the case of some REDD+ projects that are already being implemented.
5. Some local environmental information platforms are used as a citizen attention mechanisms. The San Martín region operates a virtual platform for environmental complaints called SIREDA, and also works on regional environmental information systems (CRIS) linked to national portals.
6. The Program should take advantage of the regional technical groups: CAR, CAM, REDD+ Working Roundtables, Wildlife Control and Surveillance Roundtable, the Social Conflict Resolution Roundtable, the Water Access Technical Roundtable, the Participatory Surveillance Committee, ANP Management Committees, the Inclusive and Low Emissions and Inclusive Rural Development Group, Conservation Concessions Network, and the Regional Safeguards Committee, among others.
7. The role of the CAR and the gender approach need to be considered in the design of the benefit sharing proposal.

In the case of the multi-stakeholder meetings and workshops held in the Ucayali Region, the principal comments were:

1. Groups' representative of different actors should be convoked.

2. There are a range of institutions established by law, such as the Regional Cooperation Council, the Regional Environmental Authority, the Chamber of Commerce, and indigenous organizations that should be considered within the participation program.
3. The Ucayali Region has recognized participatory spaces such as CAR (led by GOREU), CAM in Atalaya and Padre Abad, the regional REDD+ and ecosystem services roundtable, and the oil palm, cocoa, and camu camu technical roundtables, which have participatory experience and can facilitate the implementation of actions.
4. There are efforts related to the preparation of the region's Concerted Development Plan, farmers' and cooperatives' organizations, agrarian and forestry unions, which can serve as spaces for consultation and implementation of actions.
5. Some organizations such as the Ombudsman's Office are seen as neutral, while institutions such as MINAGRI should include more representatives from center of population.
6. Regional consultation roundtables, forest management committees, and monitoring and surveillance committees can also serve as spaces for consultation.

A round of bilateral consultations to ascertain stakeholders' interest prior to the design phase was added, prior to the design stage, to the roadmap for the benefit-sharing proposal.

Further details related to the evaluation of impacts, risks, and mitigation measures and the MAC proposal are included in the safeguards section (section 14); the governance proposal is presented in section 6.1.

6. OPERATIONAL AND FINANCIAL PLANNING

6.1 Institutional arrangements and implementation

Context

The institutional arrangements for the ER Program should be viewed in a context where there is a growing interest in improving inter-institutional coordination among sectors and among levels of government. At the same time, it should be recognized that the context for the management of forests and climate change, of which this Emissions Reduction Program is part, is complex, since it includes the implementation of policies, plans, strategies, international commitments, programs, and projects in which different public and private actors are involved. This represents a challenge to advancing the framework of a common vision to reduce the loss of forests and to achieve synergy between instruments and actors, territorial articulation and efficiency in the use of resources.

In response to the need for improved forest governance and coordination, a number of coordination mechanisms has been recently established.

A temporary **Multi-sectorial and Intergovernmental Commission for the Establishment of Priority Public Actions for the Promotion of the Sustainable Development of the Amazon Territories (MIC)**, under the Presidency of the Council of Ministers (PCM), has been created, with the objective "*to identify public actions of high relevance for the promotion of the sustainable development of the Amazon Territories; and an Action Plan 2018-2021, for the territory integrated by these regions*". This Commission will: a) carry out a diagnosis of policies, programs, and projects for the productive development of the Amazon, in line with the promotion of a green economy; b) diagnose the current situation of the provision of public services aimed at the productive development of the Amazon and economic activities that have an impact on rural development; and c) formulate proposals for improving the management

and efficient provision of services and productive development, with appropriate cultural relevance. In addition, this Commission has also incorporated in its mandate the formulation of an institutional proposal for the promotion of a territorial approach for multi-sectorial, multilevel and multi-stakeholder action in the Amazon regions. The results of the Commission's work are expected to be available in mid-2019.

Within the context of deforestation and climate change, a high-level committee (the **Multisector and Multilevel Committee on Forest and Climate Change Governance - CMMGBCC**), led by MINAM and MINAGRI-SERFOR, but including other ministries, regional and local governments, indigenous peoples, civil society, academia, and the private sector, has been established to address forest and climate change governance, including the generation of recommendations for the prioritization and implementation of strategic actions for the management of forests and climate change, the monitoring of those actions, and guidance for the development of technical or other instruments related to implementation. This committee is forging participative debates on key issues about REDD+, interventions, and institutional cooperation related to the governance and implementation of the National Forests and Climate Change Strategy (ENBCC)⁷². This process of defining forest and climate change governance should culminate in mid-2019 and is expected to be duly aligned with that defined in the Framework Law of Climate Change and the Forestry and Wildlife Law.

Within this entity, various sub-committees have been proposed:

- Technical and/or thematic sub-committees (Subcommittees on Safeguards, Forest Monitoring, Nesting, Benefit Sharing and a Financial Mechanism, ENBCC implementation monitoring, and others that may be created in the future).
- Other types of working groups related to programmatic and territorial themes, such as regional subcommittees on forests and climate change, potentially applicable to the ER Program, could also be created in the future.

Forest and climate change governance envisioned is guided by the following principles:

- *Multilevel*. Since competencies and functions on forests and climate change are distributed at national, regional and local levels of government, governance must articulate all these levels.
- *Multi-sectorial*. Since deforestation is a problem that is multi-sectorial in nature, the participation of sectorial authorities is needed to generate a comprehensive and coherent response.
- *Participation*. The participation and effective involvement of all actors involved in the management of forests and climate change, such as representatives of sectorial authorities, regional and local governments, indigenous peoples, civil society, academia and private sector, is needed in order to generate an effective response to deforestation and climate change.
- *Complementarity*. The different national and international programs, projects, initiatives and/or commitments on forests and climate change in Peru have different strengths and approaches which need to be harnessed in a complementary fashion.
- *Transparency*. All decisions taken within the framework of forest governance and climate change are made in a framework of transparency. It also promotes timely access to information on actions undertaken in governance on forests and climate change, ensuring the right of access to information for citizens and avoiding asymmetrical information for participation and decision making.

⁷² MINAM, Working Paper, "Forest Governance and Climate Change", V.02-21.12.18

- *Accountability.* The authorities responsible for the management of forests and climate change, and the public and private entities that administer financial resources involved in governance, must be accountable to governing entities.

Forest and climate change governance also incorporates the following cross-cutting approaches:

- *Equality:* Public entities have the responsibility to carry out the necessary actions to guarantee equality between women and men, developing policies to counter negative situations that ignore the presence of women in climate change mitigation and adaptation measures, prioritizing their interests and needs, and considering differentiated impacts⁷³.
- *Interculturality:* The recognition of cultural differences as one of the pillars of the construction of a democratic society, based on the establishment of relations of equity and equality of opportunities and rights.

The **regional governments** are important actors in forest and land use governance due to the transfer of responsibilities as part of the governance decentralization process. However, the term of office of the current regional governments runs from January, 2019 to December, 2022, with no possibility of re-election. Given the novelty of many of the themes of deforestation and climate change to the incoming governance teams, orientation will be provided by the Governors' Climate and Forests Task Force (GCF Task Force)⁷⁴ in the form of projects that are being developed, with the assistance of the Earth Innovation Institute, by 6 sub-national governments (among them San Martín and Ucayali). The objective of these projects is: *"Regional Governments, and key actors in these regions, organized in networks around appropriate governance mechanisms, build strategic planning tools and develop skills that enable them to strengthen their leadership to manage their jurisdictions under a landscape approach, promote Low Emissions Rural Development with Reduced Deforestation, increase their production and competitiveness, and meet their national and international obligations to reduce GHG emissions associated with land-use change"*.

The Presidency of the Council of Ministers has also launched the promotion of **Regional Development Agencies (ARDs)** in order to address problems, identified by the OECD, related to the effective delivery of regional policies:

- Gaps in critical skills and capacities at the subnational level, including policy development and evaluation, strategic planning, procurement and project/program delivery.
- Lack of coordination between ministerial and regional priorities and regional as the priority of ministries is included in the planning and policy cycle at the subnational level (and vice versa).
- Gaps between strategic plans and fiscal structures at the national and sub-national levels.
- Fragmentation of public investment and services at the regional and local levels.
- Variations in the quality and implementation of key planning instruments.
- Lack of systems of cooperation among regions.

⁷³ Law No. 30754, Framework Law on Climate Change

⁷⁴ International network of sub-national governments from different parts of the world (e.g. Indonesia, Brazil, Mexico and Peru). It currently has 38 members; 7 are from Peru (Loreto, Amazonas, San Martín, Ucayali, Madre de Dios, Huánuco and Piura).

The ARDs are mechanisms of coordination and inter-sectorial and inter-governmental articulation in a territory, whose responsibility is to lead the articulation of the entities of the national government in the territory, facilitate intergovernmental coordination around the priorities of the national government, and promote with regional and local governments public actions required to strengthen the economy and social capital of the territories. ARDs also seek to connect the private sector with international opportunities, promote regional competitiveness and/or public-private integration, as well as with stakeholders, community and representatives of civil society, NGOs, and universities.

ARD implementation is expected to begin in San Martin during the first half of 2019. However, to date, knowledge of the ARD proposal by stakeholders and regional government authorities, elicited during regional consultations, appears to be quite limited, whereas a variety of other inter-institutional coordination mechanisms exist, with different degrees of activity, such as the Regional Environmental Committees (CARs), Municipal Environmental Committees (CAMs), the Public-Private Coalition, Forest and Wildlife Management Committees (CGFFS), REDD+ roundtables and various thematic working groups.

Finally, it should be mentioned that Amazonian regional governments are promoting the creation of an **Amazonian Commonwealth**, a figure acknowledged in the Peruvian law. The Commonwealth would replace CIAM as a coordination mechanism, mainly for themes related to the environment and regional development.

Governance and institutional arrangements of the ER Program

The institutional arrangement and governance mechanisms of the ER Program incorporates the outcomes of these processes. The public policies and institutional arrangements defined by the MIC will be binding for sectorial policies, strengthening territorial management and decentralization. Similarly, the MMCBCCG is expected to increase inter-sectorial and multilevel cooperation in the context of the ENBCC, and by extension, the ER Program. At the regional level, the ARDs or other existing entities are expected to improve territorial articulation and to marshal the private sector and civil society for the promotion of the sustainable regional development. Finally, the construction of regional roadmaps for low emission rural development promoted by the GCFTF will catalyze the initiatives of the new regional administrations with respect to the ER Program and the other three national processes outlined.

Taking these inputs into consideration, in May 2019 final meetings were carried out with the regional governments and stakeholders to define a specific governance structure for the ER Program. The participatory methodology for this exercise included 5 steps:

1. Mapping of current governance institutions
2. Diagnosis of the pros and cons of each institutions related to governance
3. Preliminary choice of alternatives
4. Socialization of options and draft proposal
5. Selection of final design option

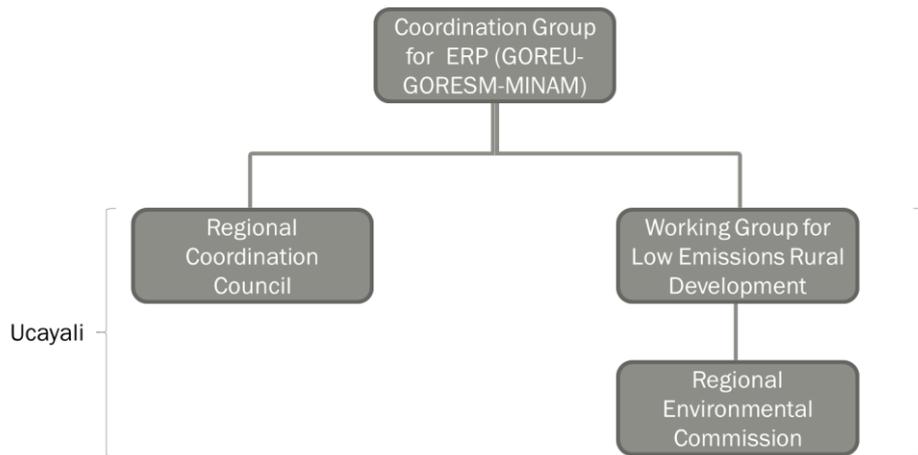
With regards to the final selection of options, five criteria were used:

- A pre-existing institution was preferred in order to avoid the creation of new institutions
- The institution should be legally recognized

- The institution should be focused on LULUCF and climate change issues
- The institution should have a balanced participation of public entities, agrarian and forestry producers, indigenous people, private sector and civil society
- The institution is currently active and is recognized by stakeholders.

Figure 6.1.1 presents the overall governance model of the ER Program. The following sections detail the roles and responsibilities of each institution.

Figure 6.1.1. Governance of the Emission Reduction Program for San Martín and Ucayali



National Level

MINAM, in representation of the Peruvian government, will be responsible for overall coordination and implementation of the ER Program and is expected to be the signatory of the Emission Reduction Payment Agreement (ERPA). MINAM is also responsible for REDD+ and is the focal point of the UNFCCC. MINAM will be responsible for global coordination of the projects and their budgets, global monitoring of the Program, and high-level agreements among actors. MINAM currently has a staff of 15 technicians who are involved in coordination of REDD+ and associated projects.

MINAM will work closely with MINAGRI within the governance framework of the Multisector and Multilevel Committee on Forests and Climate Change Governance, the National Committee on Forests and Climate Change, and the regional governments of San Martín and Ucayali. MINAM will co-chair with MINAGRI the aforementioned Committees and will also assume the role of Technical Secretariat.

Currently, the operational coordination and supervision of the implementation of projects and programs by MINAM is the responsibility of personnel assigned to individual projects, as well as technical units or thematic areas (e.g. the forest monitoring group, or the social and environmental safeguards group) that cut across projects. These are complemented by the following technical capacities:

- Forest Monitoring/GeoBosques Unit
- Sustainable Production Systems Promotion Unit
- Capacity Strengthening Unit

Within MINAGRI/SERFOR, there are technical capacities for ecological restoration, promotion of ecosystem services, integrated territorial management, community forest management, forest concession management, forest land use planning and zoning, and forest and logging control. However, there is no team or area dedicated specifically to REDD+.

Within the context of the ER Program, however, a special coordinating unit within MINAM will be formed in order to assure operational alignment and coordination of objectives, activities, budgets, and monitoring and reporting of results of the projects and activities that make up the ER Program.

Sub-national level

The Coordination Group of the ER Program at the supra-regional level is a trilateral coordination group composed by representatives of the regional governments of Ucayali and San Martin and the Ministry of Environment. Overall coordination will include fundraising, Program management, supervision and monitoring, and coordination and dialogue with stakeholders. At this time, both regional governments have designated a titled member and a substitute member for the working group. These regional representatives will ensure close coordination between the environmental authority (ARA) and the Economic Development Directorate of the regional governments, and is a clear expression of the production protection approach.

The Program Management Units of the Regional Governments of San Martin and Ucayali are found under the Coordination Group. They will be responsible for implementation of the ER Program in each of the regions and will report to the regional governments as well as the Coordination Group.

In the case of Ucayali, the Regional Coordination Council (RCC) was chosen to play this role for various reasons: it is led by the Regional Governor, is legally recognized, and it has a balanced composition of public and private stakeholders. Since the RCC can create specific working groups under its structure, a specific operational unit for the ER Program is being considered. Within this structure, the decentralized units of the Regional Government can also play linking the regional government with the provinces, which has been a permanent concern of stakeholders during the participation process.

In the case of San Martin, two existing institutions were selected for the governance of the ER Program. One is the Technical Group for Low Emissions Rural Development (GTDRBE), which was created by a regional executive resolution. This working group integrates the regional environmental regional authority and economic development directorate of the regional government. The other is the Regional Environmental Commission (CAR), which will be active in validation. CAR is recognized by different legal instrument, including the recently approved Framework Law of Climate Change.

The functions of this governance structure are:

- Provide technical and strategic guidance about the evolution of the ER Program and propose adjustments to the prioritization of activities, based on annual and specialized forest loss data.
- Supervise, to the extent possible, the field implementation of interventions funded by the ER Program and others that are aligned with the ER Program and contribute to the reduction of GHG emissions in San Martin.
- Disseminate information about the ER Program and how it can create opportunities for potential beneficiaries, especially local and indigenous communities and rural producer organizations, especially in districts outside of the regional capital

- Supervise the application of social and environmental standards required by the World Bank and Carbon Fund.
- Supervise the benefit sharing mechanism and benefit distribution.

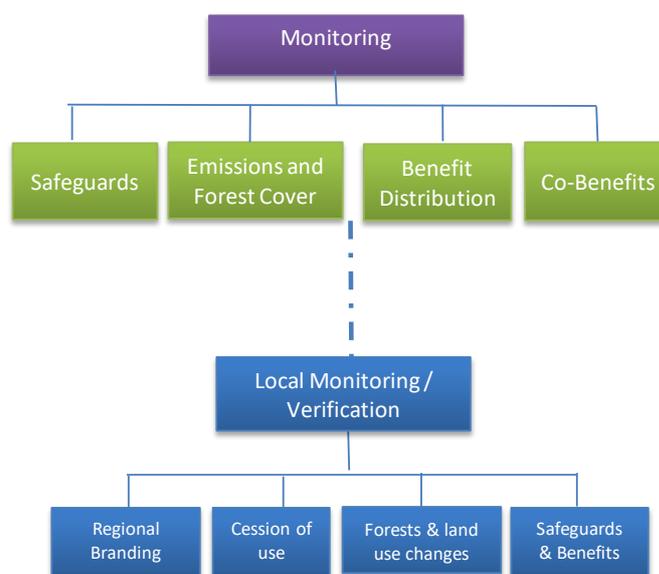
In the case of CAR, it will validate Program activities and make recommendations to the GTDRBE.

A more detailed analysis of other options considered during the mapping stage may be found in Annex 10, which also includes a summary of bilateral meetings with regional governments as well as participatory workshops.

Monitoring and Evaluation

Monitoring and evaluation of the Program will incorporate inputs from the monitoring of forests and land use by the PNCBMCC (see section 9), safeguards monitoring by the SIS, including the grievance mechanisms (MAC) (see sections 14.2 and 14.3), the benefit distribution systems (see section 15), and the registry of non-carbon benefits (see section 16). In addition, the regional governments and local communities will monitor and verify regional branding, cession of use contracts, changes in land use and forests, and safeguards and benefits. Local verification of this information, as well as socio-environmental information provided by SIS will be carried out by teams of the Regional Environmental Authorities (ARAs) of the regional governments in collaboration with local community representatives.

Figure 6.1.2. Emission Reduction Program monitoring



Institutional responsibilities and procedures for monitoring and evaluation will be developed in greater detail during 2019. It is expected that an operative version will be available by the third quarter of 2019.

Financing

Three main types of financial flows will be coordinated by the Program: 1) the financing originating from the different projects, 2) new financing, usually from PIPs or international cooperation needed in order to close financial gaps, and 3) payments from the Carbon Fund at the time of verification of the emission reduction credit (see section 6.2, below). MINAM will be responsible for overall financial coordination, as well as the development of proposals for bi- or multi-lateral cooperation and results-based payments

from the Carbon Fund; however, the development of new PIPs will be the responsibility of regional or local governments.

Payments from the Carbon Fund will be transferred directly to the trust entity to be selected. This financial mechanism is being developed by the DCI project and is expected to be defined by December, 2019.

It should be noted that MINAM has a long history of adequately managing hundreds of millions of dollars in international cooperation. The Finance and Administration; Planning, Monitoring and Evaluation; and Legal Units of MINAM will assist with project and fund administration. Periodic financial audits will be performed to verify adequate financial management. In addition, financial information is accessible to the public, as stipulated by the law on access to public information. Financial reports are published on a semester and annual basis.

6.2 ER Program Budget

As mentioned in section 4.3, the ER Program will take coordinate and align a host of active and planned internationally funded projects, public budgets, private investment capacity, credit, and expected payments for emissions reductions from the Carbon Fund in order to finance the proposed interventions. The thematic, geographic, and chronological scope of these budgets have been analyzed and only those funds that are applicable to the ER Program interventions, accounting area, and time frame have been included in the ER Program budget. Given the fact that many of these projects are presently on-going, they should enable rapid progress during the initial years of the ER Program.

Most of the interventions are financed by existing sources of funding. However, there are some activities without clearly defined sources of funding, which will be financed through PIPs, increases in institutional budgets, or multi-lateral funding (see the section on financial gaps, below, for more details).

Costs

The total costs of the ER Program are estimated at US\$ 226.155 million, including the public and private investments estimated to be implemented during the six-year execution period, 2019 – 2025 (a preparatory period of one year and five years of intervention). These costs can be disaggregated into:

- Implementation costs: US\$ 211.019 million (93.3%),
- Financing costs: US\$ 9.645 million (4.3%).
- Management and administration: US\$3.094 million (1.4%),
- Transaction costs: US\$ 1.533 million (0.7%), and
- Institutional costs: US\$ 0.864 million (0.3%).

During the 6-year-long preparatory and implementation period, approximately 2.5% (US\$ 5.605 million) of the budget is allocated to year 0 for preparation costs. Annual investments during implementation are in the range of US\$ 31.204 million to US\$ 52.720 million. A detailed breakdown by intervention and activity for each year is given in Annex 11.

The breakdown of Program costs by strategic lines and interventions is shown in Table 6.2.1. Clearly, the interventions within the forest (strategic line #1) and outside the forest (strategic line #2) contribute to about 80% of total costs, while strategic lines #3 (US\$ 16.779 million) and #4 (US\$12.862 million) contribute about 13%.

Table 6.2.1. Disaggregation of costs of the ER Program.

Program Activities	Principal Activities	%
Strategic Line #1: Conserving and increasing the value of forests	58,249,332	25.7
1.1 Classification, zoning and titling of forests and land	2,846,551	1.3
1.2 Strengthening governance of indigenous forests for conservation or sustainable production	4,799,136	2.1
1.3 Conservation of forests in protected natural areas and conservation concessions	370,905	0.2
1.4 Community Forest Management (MFC) of wood and non-wood products	24,469,234	10.8
1.5 Sustainable forest management in forest concessions	25,763,505	11.4
Strategic Line #2: Increase productivity, intensification and competitiveness of climate-friendly production systems.	123,127,084	54.4
2.1 Assignment of cession of agroforestry use rights	1,200,000	0.5
2.2 Promotion of increased productivity, intensification and quality of coffee, cocoa and oil palm in largely deforested areas.	77,222,054	34.1
2.3 Improve the productivity of family agriculture in order to generate surpluses for local markets	7,196,280	3.2
2.4 Promotion of commercial reforestation by community-business alliances.	37,508,750	16.6
Strategic Line #3: Creating non-agricultural employment through investment promotion	16,779,776	7.4
3.1 Promotion of private investment in low-emission agro-industrial or silvoindustrial activities.	16,724,776	7.4
3.2 Promotion of linkages/compensations between forest conservation and commercial value chains	55,000	0.02
Strategic Line #4: Improve institutional enabling conditions.	12,862,596	5.7
4.1 Alignment and coordination of sectors and different levels of government.	1,509,685	0.6
4.2 Establish regional and national policies to avoid land use change authorizations, promote local forests management and link deforestation reduction targets with additional public finance	321,391	0.1
4.3 Classification, zoning and titling of land and forests (see also Strategic Lines 1 and 2)	--	
4.4 Monitor, control and enforce land and natural resource rights and their classification at the regional level.	5,606,740	2.5
4.5 Improve the availability, access and use of information, especially at the regional level.	3,323,070	1.5
4.6 Increase institutional resources and capacities	2,101,710	0.9
Institutional and transaction costs	2,396,967	0.9
General project administration (1.5%)	3,093,619	1.4
Financing costs	9,645,322	4.3
GENERAL TOTAL	226,154,696	100

Within strategic lines, costly interventions in strategic line #1 include MFC for timber or non-timber products and MFS (a total of about US\$ 50 million), due to production costs. These costs are assumed to be covered mainly by private investors or projects. In strategic line #2, about US\$ 115 million will be invested in intensified coffee and cocoa production and reforestation. In strategic line #3, most of the costs are due to expected investments of private companies of approximately US\$ 15 million. In strategic line #4 (enabling institutional conditions), land use monitoring, control, and enforcement and improved information access, use, and dissemination account for about US\$ 9 million of the almost US\$ 13 million invested contemplated in this strategic line.

About 75% of institutional costs are due management and administrative costs, while the remainder are REDD+-related. Almost 80% of transaction costs are associated with improvement of the reference level and MRV.

Private sector investments represent by far the majority (US\$ 186 million, equivalent to about 82%) of the ER Program costs, compared to the almost US\$ 40 million contributed by international projects and public budgets. Most of the private sector investment is comprised of out-of-pocket costs (about US\$ 120 million) related to forest and agroforestry production (including 28,500 farmers, 70 indigenous or campesino communities, 6 forestry concessionaires and a various forestry businesses). Another US\$ 66.49 million are contributed by 4 reforestation or other companies similar to Refinca (US\$ 32.06 million) or credit (US\$ 34.43 million).

Private sector investments will be facilitated by the efforts of various projects under the ER Program umbrella (e.g. FIP, Sustainable Landscapes, SERFOR/CAF, and a platform planned by USAID) as well as the investment promotion units of the regional governments. Moreover, Refinca's planned investment in reforestation amounts to US\$ 60 million (US\$ 32 million during the accounting period) and is currently being implemented. An additional US\$ 80 million (US\$ 21 million during the account period) investments for investment in reforestation by small and medium producers in synergy with Refinca is being negotiated with the Andean Development Bank (CAF) (see below). Finally, efforts to increase increase credit for agricultural and forestry producers, via the restructured Agrobanco or other financial institutions, are currently underway.

The credit needs for agricultural and forestry production are on the order of US\$ 34.48 million, of which US\$ 13.48 million can be met through the use of US\$4.48 million of existing credit (FONDESAM). Another US\$ 21 million is expected from CAF for reforestation by small and medium producers to complement the Refinca project. Negotiations between Refinca, the Ministries of Environment and Agriculture, and CAF have produced agreement on this project and a technical proposal is being prepared. The risk of obtaining this credit is estimated to be low-medium. Should this credit not be forthcoming, the principal impact would be the reduction of reforestation of 7500 ha during the ER Program intervention by producers or groups associated with Refinca. This would reduce the expected emission reductions by 81,000 tCO₂e, a negligible amount.

Sources of financing

An estimated US\$ 317,726,494 in financing will be generated during the timeframe analyzed. Revenues from the sale of products from productive systems (US\$ 188,203,252 million – about US\$ 111.6 million from agroforestry and US\$ 76.6 million from forestry) are responsible for the large majority (59%) of financing. Other sources include:

- US\$ 35.674 million in project financing, principally by FIP (US\$ 19.07 million), GEF (US \$5.68 million), and Norway and USAID (about US\$ 4.5 million each), and other projects with less than US\$ 1 million,
- US\$ 25.478 million in credit including US\$21 million from CAF for business - community reforestation and US\$ 4.48 million in revolving funds for agroforestry from FONDESAM that will be leveraged to a value of \$13.43 million,
- US\$ 32.062 in investments from Refinca and other private sector businesses,
- US\$ 32 million in expected payments for emissions reductions from the Carbon Fund, and
- US\$ 4.310 million from public budgets, including almost US\$ 3.5 million from the regional governments.

Should the US\$ 21 million in credit from CAF not be obtained, revenues are unaffected, since these are estimated to come in later years and are not included in the budget calculations. In a similar fashion,

revenues from Refinca’s investments in forestry plantations are also not included in the above calculations.

Financial Gaps and Plan

Although the Program is expected to generate a surplus of US\$ 90,004,632, it should be noted that there is an absolute budget deficit in years 0 (US\$ 0.758 million) and 1 (US\$ 1,765,496 million). Moreover, despite positive net revenues in year 2 of US\$ 7.2 million and US\$ 27.5 – 29.7 million in years 3 – 5, there is an institutional deficit in all years that total US\$ 11.70 million, mainly due to the fact that the majority of revenues accrue to the private sector.

The institutional deficit is shown in Table 6.2.2 and is made up of costs related to ER Program preparation, REDD+, and new activities or those not covered by current projects. Preparation of the ER Program and REDD+ by MINAM entail a cost of US\$ 1.66 million. Principal costs include the design, implementation, and continual improvement of: the safeguards system (including SIS), the grievance redress mechanism (MAC), the benefit distribution plan, the emissions factors, the methodology for estimating forest degradation, community monitoring, and the emissions reduction registry. It is estimated that this gap of US\$ 1.66 million could be financed from the additional US\$ 5 million in R-PP funding recently received by the country.

Another US\$ 10.04 million is needed for new activities or those not covered by current projects as well as project management and administration. Areas in need of funding include: forest monitoring in indigenous communities, assignment of rights to local riverine forests and assistance to producer groups there, the reassignment of forestry concessions, the formation of forest management clusters by business-community alliances, the use of blockchains to establish the economic identity of producers and product traceability, and the strengthening of institutions involved in the promotion of investment and employment. In the area of institutional enabling conditions, funds are needed for coordination at and among different levels of government, monitoring of cession of use contract and branding, better information gathering, use, and dissemination and linking, especially in the forestry sector, and institutional resources and capacities.

The plan to close this gap seeks to generate US\$ 10.08 million from PIPs for new or unfunded activities. With regards to the PIPs, at the regional level there are US\$ 59.58 million in the pipeline for the agriculture and environmental sectors for the next 3 years and an additional US\$ 16.25 million from municipal PIPs supported by DEVIDA for the agricultural and environmental sectors. Some of these funds could be dedicated to priority districts identified by the ER Program.

Table 6.2.2 Financing gaps associated with ER Program implementation.

Need	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	TOTAL	Source
New or unfunded activities	160,000	1,260,604	2,040,604	1,175,604	1,175,604	1,135,604	6,948,022	PIPs
Management and administration costs		634,034	689,246	665,339	540,863	599,494	3,128,976	
MINAM								
ER Program preparation	580,000	-	-	-	-	-	580,000	R-PP additional

Administration of REDD+ (Institutional and transaction costs)	18,400	48,070	50,474	318,647	321,297	324,079	1,080,967	funds
TOTAL	0.76	102.49	21.85	17.36	12.83	55.32	210.62	

Financial and economic analysis of the ER Program

Analysis of cash flows

The overall Emission Reduction Program generates positive returns and cash flow is positive after year 1, not including the sale of surplus emissions reductions to buyers other than the Carbon Fund. The financial analysis based on a discount rate of 10% and a carbon price of US\$ 5/t C yields an NPV of US\$ 62.081 million and an IRR of 275%, while in the economic analysis using a discount rate of 6% and a carbon price of US\$ 30/t C the NPV is US\$ 206 million and the IRR is 668% (Table 6.2.3).

Sensitivity analyses

These positive results for the economic and financial analyses are robust over the entire range of costs (increases of 10% - 30%), total revenues (reductions of 10% - 30%), revenues from agroforestry and forest products (decreases of 10% - 30%), and discounts rates (+ 2%) varied, except for reductions in total revenues of 30%. In general, reductions in finances have the greatest impact on the NPV, IRR, and overall 5-year returns, followed by increases in costs, and decreases in revenues from agricultural and forest products. All scenarios show a positive cash flow beginning in year 2 or 3 (years 1 or 2 of implementation). Larger decreases in finances and increases in costs delay the achievement of positive cash flow by one year.

Identification of risks and measures to address them

The sensitivity analysis identified finances as the factor that most affects Program financial or economic performance. Within this category revenues from the sale of goods or services is most at risk due to fluctuations in prices. However, the emphasis of the Program in improving market linkages, especially those with decommoditized markets that value sustainability and quality, will act to reduce this risk. Regional branding and market intelligence will also assist in reducing the risk of price fluctuations. Other risks to finances include changes in policies at the national or regional level or by international donors, however, these risks are perceived to be low, since donor and public financing is largely committed. Finally, the risk of being unsuccessful or only partially successful in obtaining a grant or loan to finance US\$ 21 million related to community reforestation is judged to be medium to low, but with no impact on revenues, since revenues occur outside the time frame considered, and negligible impact on emissions reductions.

Table 6.2.3 Sensitivity of financial and economic analyses.

Variable	Level	NPV	IRR	5 yr Return	Yr cash flow becomes (+)
Financial Analysis (discount rate=0.1, C price = \$5/ton)					
Standard		63	276	92	2
Costs	10%	46	136	69	2
	20%	29	73	46	3
	30%	12	33	24	3

Variable	Level	NPV	IRR	5 yr Return	Yr cash flow becomes (+)
<i>Total revenues</i>	-10%	40	127	60	3
	-20%	16	51	28	3
	-30%	-7	-7	-4	3
<i>Revenues from sales of products</i>	-10%	50	233	73	2
	-20%	37	186	54	2
	-30%	23	133	35	3
<i>Discount Rate</i>	-2%	68	276	92	2
	2%	59	276	92	2
Economic Analysis (discount rate=0.06, C price = \$30/ton)					
<i>Standard</i>		206	668	255	2
<i>Costs</i>	10%	187	408	232	2
	20%	168	287	209	2
	30%	149	214	187	2
<i>Total revenues</i>	-10%	167	391	206	2
	-20%	127	246	158	2
	-30%	87	152	110	2
<i>Revenues from sales of products</i>	-10%	191	644	236	2
	-20%	176	619	217	2
	-30%	161	593	198	2
<i>Discount Rate</i>	-2%	221	668	255	2
	2%	193	668	255	2

With regards to costs, those related to the implementation of productive systems are most important and may be affected by increases in the prices of labor, inputs, and transaction costs. In this regard, the use of blockchain-based traceability should reduce transaction costs along the value chains. The formation or strengthening of producer organizations should also produce economies of scale for input or equipment purchases or commercialization costs, besides being important for negotiating better sale prices. Although technification may be able to reduce the need for labor, labor shortages are not anticipated, since the two regions receive large numbers of migrants.

7. CARBON POOLS, SOURCES AND SINKS

7.1 Description of Sources and Sinks selected

Sources/ Sinks	Included?	Justification / Explanation
Emissions from deforestation	Yes	<p>Deforestation is the principle source of CO₂ emissions in the accounting area as discussed in the National Forest Reference Emission Level (FREL) accepted by the UNFCCC in 2016. The average annual emissions, from 2008-2017 in the accounting area, due to this source are 23,941,388.61 tCO₂e/yr, as detailed in Section 8.</p> <p>The annual deforestation activity data is based on forest cover loss registered with image change analysis from Landsat images, in collaboration with the University of Maryland, and a forest/non-forest</p>

Sources/ Sinks	Included?	Justification / Explanation
		base from the year 2000. Forest cover loss from river meandering is excluded in the annual count, as detailed in Section 8.
Emissions from forest degradation	Yes	<p>Forest degradation in “forest remaining forest” has been approximated using a proxy-based approach detailed in GOF-C-GOLD Sourcebook (2016)⁷⁵, Section 2.2.2.2: “Indirect approach to monitor forest degradation”. The average annual emissions, from 2008-2017 in the accounting area, due to this source are 9,845,699.97 tCO₂e/yr, as detailed in Section 8.</p> <p>The proxy-based approach involves the intact forest concept in which a forest can be divided into intact forest (i.e. fully stocked) and non-intact forest (i.e not fully stocked) based on the distance from a perturbation or non-forest area. The intact forest is stratified based on spatial criteria that are applied objectively and systematically over the accounting area through GIS. The criteria for minimum area extension and buffer area stratify the forest (i.e. “forest remaining forest” in the annual forest cover loss count) into six non-intact forest categories of increasing amounts of spatial isolation from the “core” forest.</p> <p>The non-intact categories include perforation, edge, bridge, loop, branch, and islet. The buffer distance used to map the distance between the core forest and the non-intact forest categories is based on the carbon map from Asner et al. (2014)⁷⁶, where a plateau of carbon density from non-forest edge towards the core forest is reached at approximately 210 m.</p> <p>Separate emission factors for each non-intact forest category is based on the average carbon density from the carbon map of Asner et al. (2014) and then used as a scale applied to the emission factors of each ecozone [i.e Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), and Selva Alta Difícil (Difficult Access High Jungle); see Section 8] used in the FREL (2016)⁷⁷. Further details are described in Sections 8 and 13.</p>
Enhancement of carbon stocks	No	<p>This GHG sink (i.e. conversion of non-forest land to forest land) is not included due to the lack of local data to generate a reference level for this activity, principally activity data of natural/assisted recovering areas and appropriate emission factors.</p> <p>This sink is not included in the national FREL (2016).</p>

⁷⁵ GOF-C-GOLD, 2016, a sourcebook of methods and procedures for monitoring and reporting anthropogenic greenhouse gas emissions and removals associated with deforestation, gains and losses of carbon stocks in forests remaining forests, and forestation. GOF-C-GOLD Report version COP22-1, (GOF-C-GOLD Land Cover Project Office, Wageningen University, The Netherlands).

⁷⁶ Asner GP, Knapp DE, Martin RE, Tupayachi R, Anderson CB, Mascaro J, Sinca F, Chadwick KD, Soutsan S, Higgins M, Farfan W, Silman MR, Llactayo WA, Neyra AF: *The Carbon Geography of Perú*. Minuteman Press, Berkeley, CA; 2014.

⁷⁷ Peru’s submission of a Forest Reference Emission Level (FREL) for reducing emissions from deforestation in the Peruvian Amazon (2016).

Sources/ Sinks	Included?	Justification / Explanation
Conservation of carbon stocks	No	This GHG sink is not included due to the lack of local data to generate a reference level for this activity. This sink is not included in the national FREL (2016).
Sustainable forest management	No	This GHG sink is not included due to the lack of local data to generate a reference level for this activity. Sustainable community forestry and sustainable forest management in forestry concessions are included as interventions, but their impact is on avoided deforestation. This sink is not included in the national FREL (2016).

7.2 Description of Carbon Pools and greenhouse gases selected

Carbon Pools	Selected?	Justification / Explanation
Aboveground biomass	Yes	Aboveground biomass is a principal carbon pool and is included in the National Forest Reference Emission Level (FREL) of 2016. Peru counts with national data, although from various public and private sources, on carbon stocks of above-ground biomass of living trees. Peru is currently developing a National Forest Inventory (NFI), which has recently completed its first stage of field data collection. The NFI data will be included in the reference level once the data becomes available, as an opportunity to refine emission factor data. Activity data is scheduled to remain satellite based.
Belowground biomass	Yes	Belowground biomass is a principal carbon pool and is included in the FREL of 2016. Values were derived from aboveground biomass by using Mokany <i>et al.</i> (2016), which is referenced in the default values of the IPCC (2006). However, it should be noted that there is a lack of national data on below-ground biomass and the NFI does not collect this information.
Litter	No	The ERPD will not include litter as a carbon pool. Note that there is a lack of complete data from direct measurements for this category. Neither the FREL (2016) nor National GHG Inventory (2012) ⁷⁸ estimates this pool. Preliminary data from the NFI indicate that litter accounts for 1.3% of the total carbon stock. The exclusion of this carbon pool ensures conservative emission reductions estimates, as emissions in the reference level would be lower compared to the case in which litter is included.
Dead wood	No	The ERPD will not include dead wood as a carbon pool. Note that there is a lack of complete data from direct measurements for this category. Neither the FREL (2016) nor National GHG Inventory (2012) estimates this pool. Preliminary data from the NFI indicate that dead wood accounts for 2.0% of the total carbon stock. As with litter, its exclusion is conservative.
Soil organic carbon	No	The ERPD will not include soil organic carbon as a carbon pool.

⁷⁸ MINAM (2012) Inventario Nacional de Gases de Efecto Invernadero (INGEI) 2012. p 321.

Carbon Pools	Selected?	Justification / Explanation
		Note that there is a lack of national data from direct measurements for soil organic carbon. Neither the FREL (2016) nor National GHG Inventory (2012) estimates this pool. The NFI does not include this information.

GHG	Selected?	Justification / Explanation
CO ₂	Yes	The ER Program will account for CO ₂ emissions.
CH ₄	No	The ER Program does not include other gases resulting from biomass burning due to deforestation, given the insignificance of the results (approximately 3.5% of total emissions). Note that the FREL (2016) does not include non-CO ₂ gases. Also, there is currently no geospatial information on forest fires (i.e. fires in forest remaining forest) for the Peruvian Amazon. For carbon accounting, loss of carbon from deforestation is considered total and instantaneous within the affected area.
N ₂ O	No	

8. REFERENCE LEVEL

The Reference Level (RL) considers the decisions of the UNFCCC and follows the guidelines of the Intergovernmental Panel on Climate Change (IPCC) as indicated in Annex 12/CP17. The information presented in this section includes:

- Transparent, complete, consistent and accurate information used as inputs for the RL.
- Data and methods applied during the construction of the RL.
- Sinks, gases and activities referred to in Decision 1/CP. 16, paragraph 70.
- Forest definition used in the construction of the RL.

The Reference Level focuses on the accounting area and it is considered dynamic, since it will allow updates and improvements to the data and methodologies used to produce the estimates.

Important clarification for the national context

The Reference Level here presented is deemed in the national REDD+ context as a baseline for results-based-payments or “compensation baseline”, and is only applicable to measure the performance of the ERP under the FCPF Carbon Fund.

It does not replace under any circumstances the official Forest Reference Level (FREL) that Peru has voluntarily submitted to the UNFCCC for the Amazon biome, nor does it predetermine the updating thereof. The reductions that could occur under the FREL, do not committed with the CF, are part of Peru.

8.1 Reference Period

Based on the FCPF Methodological Framework, the period 2008–2017 has been selected as the Reference Period for the Emissions Reduction Program. This period complies with the Methodological Framework

requirements related to the ending date of the period selected. This period is also the most recent activity data available for the accounting area.

The start-date of the Reference Period is 2008, about 10 years before the end-date. The activity data for the year 2008 (and each year within the reference period) is obtained with the use of an algorithm and the use of Landsat images from the first days of the year and the last days of the same year. Therefore, the methodology detects the areas lost in each year, so in the period 2008-2017 there are 10 years.

The start-date of the Reference Period is 2008, about 10 years before the end-date. The activity data for the year 2008 is obtained with the use of an algorithm and the use of Landsat images from the first days of the year and the last days of the same year. In the year 2008, the methodology detects the areas lost in that year. So, in the period 2008-2017 there are 10 years

8.2 Forest definition used in the construction of the Reference Level

The definition of “forest” used by Peru in the context of the ERPD is a tree cover equal or greater than 30%, with a minimum tree height at maturity in situ of 5 m, and a minimum mapping unit of 0.09 ha. The minimum mapping unit is equivalent to the digital pixel size of a Landsat image (Landsat 5, 7 and 8 processed to 30 m spatial resolution), which is the main source of activity data for the Reference Level. This definition includes all forest ecosystems within the Peruvian Amazon that have these characteristics, including mature forest, and may include mature secondary forest or forest plantations⁷⁹ that are undistinguishable to a mature forest in a Landsat satellite image. This definition also excludes agroforestry and perennial crops.

This is the same definition used to produce the activity data related to forest/forest loss areas at national level within the MNCB, and as such, was used in:

- The National Forest Reference Emission Level (FREL) accepted by the UNFCCC in 2016,
- The Joint Declaration of Intent between Norway, Germany and Peru (DCI),
- The National Greenhouse Gas Inventory (2012) and the Third National Communication (2015),
- The official national data on deforestation presented by the National Institute on Statistics and Informatics (INEI).

This definition of “forest” will also appear in the second Biennial Update Report (BUR) and the Fourth National Communication to the UNFCCC.

Other forest definitions have been applied to quantify the extent of Peruvian Amazon. The Peruvian Designated National Authority of the Clean Development Mechanism (CDM) reported to the UNFCCC a definition of “forest” based on a minimum tree crown cover of 30 percent, a land area of 0.5 hectares and a minimum tree height of 5 meters. This definition is used in the context of afforestation and

⁷⁹ Although at national level there are no exhaustive national records of forest plantations, the available information allows to infer that forest plantations are not significant in the Amazon and, therefore, have no implications for the quality of the forest cover benchmark map. In its accumulated statistics of forest plantations nationwide, SERFOR (2019) accounted for 1.07 million hectares reforested until 2017, of which 381,084 hectares are located in 9 regions with presence in the Amazon (50,067 hectares in San Martín and Ucayali). However, according to the National Map of Vegetation Coverage (MINAM, 2015) and the National Map of Ecosystems of Peru (MINAM, 2018), there exist 78,005.1 ha and 77,263.7 ha of forest plantations in the country, respectively, all of them outside the Amazon limits. The different results show, on the one hand, there is still the need to build strong, reliable information on forest plantations, either through records or remote sensing methods; and on the other hand, that despite the disagreement, the reforested areas are concentrated mostly in the Sierra, while in the Amazon they could be limited.

The 9 regions mentioned above are: Amazonas, Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, San Martín and Ucayali. However, the area of plantations recorded is not disaggregated by biome, and may correspond to areas of the Sierra and the Amazon. In the cases of regions with greater extension in Sierra (Cuzco, Huánuco, Junín and Pasco), it is very likely that their planted areas are located in this biome.

reforestation project activities under the CDM. The National Forest Inventory (NFI), with initial design and support from FAO, developed a similar “forest” definition with a minimum tree crown cover of 10 percent, a land area of 0.5 hectares and a minimum tree height of 5 meters. It is worth noting that both of these definitions reflect a ground-based approach to measure tropical forests. Peru chose the now widely applied definition, which is being used in the ERP, as part of a practical approach to capture the spatial and temporal patterns of small deforestation events and register them in the annual deforestation count.

The NFI has just completed the first of five stages of data collection. Each stage is programmed to be completed within a 1 year time frame after the completion of the previous stage. The data from the NFI will be used to verify forest cover and tree height, and update emission factors once they become available. The NFI only subdivides between ecozones, where each of these strata are assigned separate emission factors. The NFI does not explicitly sample for secondary vegetation or degraded forest, although it is expected to contain plots within these forest types by chance. No plots are expected to be found in forest plantations.

8.3 Average annual historical emissions over the Reference Period

Description of method used for calculating the average annual historical emissions over the Reference Period

Construction of the RL for the accounting area is based on the 2006 guidelines established by the Intergovernmental Panel on Climate Change (IPCC), the United Nations Framework Convention on Climate Change (UNFCCC) and the Carbon Fund Methodological Framework. The activity data and emissions factors for deforestation are consistent with the methodology and data presented in the National FREL from 2016. As previously stated, the same inputs were used for the National Greenhouse Gas Inventory of 2012 (MINAM, 2016) and the Third National Communication (MINAM, 2016). Peru will use the same activity data and emissions factors for the second Biennial Update Report (BUR) and the Fourth National Communication to the UNFCCC. In addition, as Peru is working to monitor emissions from degradation, the methodology used in this RL will serve as a basis to develop a final degradation methodology, which will be used to update the national forest reference level and other international reports in the future.

The RL that Peru is presenting for the ERP to the Carbon Fund covers the San Martin and Ucayali regions and will have a lifespan of 5 years. In turn, the Reference Period covers 10 years beginning in 2008 and ending in 2017. As specified by the UNFCCC and the FCPF’s Carbon Fund Methodological Framework, the RL is expressed in tons of carbon dioxide equivalent per year and is presented in a complete and transparent manner in order to enable its reconstruction. Activity data, carbon data and documentation are available in the National Forest Conservation Program for Climate Change Mitigation (PNCBMCC) website and database known as GeoBosques (<http://geobosques.minam.gob.pe>). Peru also wishes to note that the country is following the “step-wise approach” (Decision 12/CP.17, paragraph 10) to adjust information as data becomes available and methodologies improve with technology.

The average annual historical emissions for the RL were calculated from an established methodology used for national and international reporting. Activity data is developed in collaboration with the University of Maryland, where annual deforestation is estimated from 30 m spatial resolution Landsat images over the entire Peruvian Amazon, using the year 2000 as the base year. Deforestation is detected from the spectral changes in the pixel of the Landsat time series, preferably from the last image or quality pixel available

of the accounting year. A series of spectral metrics and training pixels help narrow the results of the algorithm to identify deforestation in the base year's forest layer. Forest degradation is estimated by proxy using the distance from non-forest and deforestation to identify non-intact forest, which later is categorized into fragmentation types following the forest definition. Methane (CH₄) and Nitrous Oxide (N₂O) from burning biomass were estimated by assuming that all deforested areas were burnt, but were excluded as they were found to be *de minimis*. Emission factors were developed from forest inventory data obtained from multiple sources. This data was used to stratify Peru into a total of six ecozones, where three are found in the accounting area, namely Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), and Selva Alta de Difícil Acceso (Difficult Access High Jungle). The Peruvian National Forest Inventory (INF) is in the process of completing the second of five stages to survey the full set of sampling plots. Update of emission factors will be decided once the INF data becomes available.

Activity data and emission factors used for calculating the average annual historical emissions for the Reference Period

Activity data

<p>Description of the parameter including the time period covered (e.g. forest-cover change between 2000 – 2005 or transitions between forest categories X and Y between 2003-2006):</p>	<p>Annual deforestation (i.e. conversion of “forest” to “non-forest”,) between 2008 and 2017, developed from Landsat time-series analysis using spectral metrics. The spatial resolution is the 30 m pixel. The year 2000 was the base year for forest and non-forest. The complete dataset includes annual forest cover loss, at 30 m spatial resolution, for the entire Peruvian Amazon from 2001 to 2017. The complete activity data database can be downloaded from http://geobosques.minam.gob.pe.</p> <p>Forests are not subdivided into explicit forest types (e.g. mature forest, mature secondary forest, etc.). However, forests are stratified into “ecozones”, where each ecozone is assigned a different carbon density.</p>																															
<p>Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):</p>	<p>Deforestation is the principle source of CO₂ emissions in the accounting area as discussed in the National Forest Reference Emission Level (FREL), accepted by the UNFCCC in 2016. It is estimated to account for 72.6% of the total CO₂ emissions (not including other greenhouse gases) over the accounting area.</p> <p>The National GHG inventory (INGEI) uses the areas of deforestation to approximate the emissions of other greenhouse gases (CH₄ and N₂O), by assuming that a fraction of the total area is burnt. A similar exercise was done for the current RL, but assuming biomass burning in all the deforested areas. The results show that non-CO₂ emission represent 3.5% of total CO₂e emissions, so they were not included in the RL (see the excel book “Significance CH₄ and N₂O”)</p>																															
<p>Data unit (e.g. ha/yr):</p>	<p>All activity data units are reported as ha/yr.</p> <p>Geospatial data is obtained at 0.09 ha (30 m × 30 m) pixels.</p>																															
<p>Value for the parameter:</p>	<p>Annual deforestation (ha) in the Reference Period over the accounting area.</p> <table border="1"> <thead> <tr> <th rowspan="2">Year</th> <th colspan="3">Deforestation in accounting area (ha)</th> </tr> <tr> <th>San Martin</th> <th>Ucayali</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2008</td> <td>17,008.4</td> <td>17,300.0</td> <td>34,308.4</td> </tr> <tr> <td>2009</td> <td>38,811.8</td> <td>26,091.0</td> <td>64,902.8</td> </tr> <tr> <td>2010</td> <td>33,872.8</td> <td>18,170.8</td> <td>52,043.6</td> </tr> <tr> <td>2011</td> <td>24,872.7</td> <td>24,129.5</td> <td>49,002.1</td> </tr> <tr> <td>2012</td> <td>29,006.7</td> <td>24,914.1</td> <td>53,920.8</td> </tr> <tr> <td>2013</td> <td>22,280.9</td> <td>36,909.7</td> <td>59,190.6</td> </tr> </tbody> </table>	Year	Deforestation in accounting area (ha)			San Martin	Ucayali	Total	2008	17,008.4	17,300.0	34,308.4	2009	38,811.8	26,091.0	64,902.8	2010	33,872.8	18,170.8	52,043.6	2011	24,872.7	24,129.5	49,002.1	2012	29,006.7	24,914.1	53,920.8	2013	22,280.9	36,909.7	59,190.6
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		2014	26,146.0	32,884.0	59,030.0	
		2015	21,822.8	30,003.8	51,826.6	
		2016	20,503.4	29,819.3	50,322.7	
		2017	12,407.1	30,245.9	42,653.0	
		Total	246,732.4	270,468.1	517,200.5	
<p>Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-)processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):</p>	<p>Activity data is derived from a customized algorithm developed by Professor Matt Hansen, of the University of Maryland, for the Peruvian Amazon. It involves the annual change (i.e. forest cover loss) from Landsat 5, 7 and 8 images, through multi-temporal and spectral metrics, over the entire Peruvian Amazon. The dataset begins with a Forest/Non-Forest designation for the year 2000 (i.e. forest cover benchmark map) and then annual forest cover loss at 30 m spatial resolution from 2001 to 2017. To register the deforestation of a particular year, the final quality pixel of the accounting year is selected. In other words, a quality (e.g. no cloud cover) pixel from December 31 would be the preferred option. If it were unavailable, due to cloud cover, image unavailability or other similar factors, then the previous day would then be next option. This selection sequence continues for the year of interest until a quality pixel is selected.</p> <p>The forest cover benchmark map was established first through spectral classification of Landsat imagery and then adjusted with the feedback of regional experts. Forest cover loss was detected through multiple spectral metrics, including the following:</p> <p>Reflectance values representing maximum, minimum and selected percentile values (10, 25, 50, 75 and 90% percentiles); Mean reflectance values for observations between selected percentiles (max-10%, 10-25%, 25-50%, 50-75%, 75-90%, 90%-max, min-max, 10-90%, and 25-75%); Metric capturing the correlation between reflectance values in each band and the image acquisition date, applying a linear regression model represented by its slope.</p> <p>The pre-processed data were classified using a supervised classification algorithm that is based on decision trees, which are calibrated through a manual creation of training samples for forest/non-forest and loss/non-loss of forest and uses the metrics created at the end of the pre-processing step as data entries.</p> <p>The post-processing review involves adjustments and corrections to the final map by a panel of national experts from MINAM and MINAGRI. This final step reduces the level of classification uncertainty and error due to their knowledge of forests in Peru.</p> <p>This activity data is considered “gross anthropogenic deforestation” in the RL, as well as the FREL (2016), since non-anthropogenic forest cover loss from river meandering is excluded from the annual count. This loss is quantified by classifying water bodies in the Landsat images and overlaying them on the previous year’s forest cover. These areas would have been identified as forest loss by the algorithm. Any previous meandering areas are excluded from current and future gross anthropogenic deforestation. Annual updates are normally given by midyear.</p> <p>Other common non-anthropogenic forest cover loss includes those caused by landslides, wind storms and other flooding events. These specific types of forest loss are not excluded in the FRL, but are scheduled to be measured in the future. These non-anthropogenic forest loss events, although locally dramatic, are estimated to be less than 5% of the total Peruvian Amazon forest loss in any given year.</p> <p>For the ERPD a spatial subset of the annual activity data for San Martin and Ucayali (i.e. the accounting area) was taken from this dataset.</p> <p>For further details on image processing and methodology see “Peru’s submission of a Forest Reference Emission Level (FREL) for reducing emissions from deforestation in the Peruvian Amazon (2016)” and “Potapov, P.V., J. Dempewolf, Y. Talero, M. C. Hansen, S. V. Stehman, C. Vargas, E.J. Rojas, D. Castillo, E. Mendoza, A. Carlderón, R. Giudice, N. Malaga & B.R. Zutta, 2014. National satellite-based humid tropical forest change assessment in Peru in support of REDD+ implementation. Environmental Research Letters 9.”</p>					

Spatial level (local, regional, national or international):	The original deforestation dataset was produced for the entire Peruvian Amazon. A subset of the geospatial data was clipped for the regional level of San Martin and Ucayali.																												
Discussion of key uncertainties for this parameter:	The forest cover benchmark map of the year 2000 was based on the spectral signature and metrics of mature forests of the Peruvian Amazon using Landsat images. However, the classification of mature forest, during the benchmark year, may have been confused with mature secondary forest, disturbed prior to the year 2000, and mature forest plantations, also planted before the benchmark year. Although there is little information on the extent of these classes, Peru considers their extent limited in the year 2000. There are also no current methodology to separate these classes from each other with Landsat or other satellites during the early 2000's.																												
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/ methodology in the estimation:	<p>The estimation of accuracy of the 2008-2017 annual deforestation data over the accounting area (i.e San Martin and Ucayali as a single unit) followed the stratified simple random sampling approach established in Olofsson et al. (2014) at the 95% confidence interval. This estimation of accuracy for annual deforestation was done independently of the estimation of accuracy for forest degradation.</p> <p>The accounting area was divided into three strata: forest loss from 2008-2017, stable forest, and stable non-forest. The stable forest accounts for 85%, stable non-forest for 12% and forest loss for 3% of the accounting area, respectively. The sample size for stratified random sampling was calculated to be 100 sample units for forest loss, 400 for stable forest and 56 for stable non-forest.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="6">Unbiased accuracy assessment summary table</th> </tr> <tr> <th>Class</th> <th>Adjusted Area (ha)</th> <th>±95% CI</th> <th>User's Accuracy (%)</th> <th>Producer's Accuracy (%)</th> <th>Overall Accuracy (%)</th> </tr> </thead> <tbody> <tr> <td>Forest Loss 2008-2017</td> <td>491,341</td> <td>69,379</td> <td>89</td> <td>93.7</td> <td rowspan="3">95.4</td> </tr> <tr> <td>Stable Non-Forest</td> <td>1,531,726</td> <td>183,017</td> <td>97</td> <td>98.3</td> </tr> <tr> <td>Stable Forest</td> <td>12,493,519</td> <td>220,213</td> <td>99.5</td> <td>99.2</td> </tr> </tbody> </table>	Unbiased accuracy assessment summary table						Class	Adjusted Area (ha)	±95% CI	User's Accuracy (%)	Producer's Accuracy (%)	Overall Accuracy (%)	Forest Loss 2008-2017	491,341	69,379	89	93.7	95.4	Stable Non-Forest	1,531,726	183,017	97	98.3	Stable Forest	12,493,519	220,213	99.5	99.2
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Description of the parameter including the time period covered (e.g. forest-cover change between 2000 – 2005 or transitions between forest categories X and Y between 2003-2006):	<p>Annual gross forest degradation (i.e. biomass loss in “forest remaining forest”) was estimated by proxy using the annual forest cover loss data in between 2008 to 2017 at 30 m spatial resolution.</p> <p>We followed the general guideline of the proxy-based approach in GOF-C-GOLD Sourcebook (2016), Section 2.2.2.2: “Indirect approach to monitor forest degradation” and Morphological Spatial Pattern Analysis (MSPA) in Soille and Vogt (2009). The guidelines establish several geospatial criteria that involves dividing forest cover into intact and non-intact forest. The non-intact forest cover represents “degraded forest”, which is further subdivided into six categories with specific distance from non-forest and isolation from the intact “core” forest. See description of the source data below.</p>
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Forest degradation is estimated to contribute approximately 27.4% of the total emissions during the reference period. This estimation is derived from the proxy-based approach and has not been included in previous reports.
Data unit (e.g. ha/yr):	<p>All activity data units are reported as ha/yr.</p> <p>Geospatial data is obtained at 0.09 ha (30 m × 30 m) pixels.</p>
Value for the parameter:	Annual non-intact forest (ha) in the Reference Period over the accounting area, which does not convert to deforestation in the future or counted as non-intact in a previous or future year. This criterion avoids double carbon accounting. The total non-intact forest area is further subdivided into non-

	<p>intact forest types (e.g. forest fragmentation types) for emission calculations and is further explained below.</p> <table border="1"> <thead> <tr> <th colspan="4">Total non-intact forest (ha)</th> </tr> <tr> <th>Year</th> <th>San Martin</th> <th>Ucayali</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2008</td> <td>18,741.9</td> <td>19,878.8</td> <td>38,621.0</td> </tr> <tr> <td>2009</td> <td>28,731.2</td> <td>25,379.2</td> <td>54,110.0</td> </tr> <tr> <td>2010</td> <td>24,574.6</td> <td>15,181.5</td> <td>39,756.0</td> </tr> <tr> <td>2011</td> <td>16,447.1</td> <td>21,142.2</td> <td>37,589.0</td> </tr> <tr> <td>2012</td> <td>59,764.1</td> <td>89,000.7</td> <td>148,765.0</td> </tr> <tr> <td>2013</td> <td>33,522.3</td> <td>73,873.1</td> <td>107,395.0</td> </tr> <tr> <td>2014</td> <td>35,800.0</td> <td>105,124.1</td> <td>140,924.0</td> </tr> <tr> <td>2015</td> <td>55,675.1</td> <td>99,999.9</td> <td>155,675.0</td> </tr> <tr> <td>2016</td> <td>32,252.5</td> <td>82,196.2</td> <td>114,449.0</td> </tr> <tr> <td>2017</td> <td>25,515.9</td> <td>107,518.7</td> <td>133,035.0</td> </tr> <tr> <td>Total</td> <td>331,024.5</td> <td>639,294.5</td> <td>970,319.0</td> </tr> </tbody> </table>	Total non-intact forest (ha)				Year	San Martin	Ucayali	Total	2008	18,741.9	19,878.8	38,621.0	2009	28,731.2	25,379.2	54,110.0	2010	24,574.6	15,181.5	39,756.0	2011	16,447.1	21,142.2	37,589.0	2012	59,764.1	89,000.7	148,765.0	2013	33,522.3	73,873.1	107,395.0	2014	35,800.0	105,124.1	140,924.0	2015	55,675.1	99,999.9	155,675.0	2016	32,252.5	82,196.2	114,449.0	2017	25,515.9	107,518.7	133,035.0	Total	331,024.5	639,294.5	970,319.0
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<p>Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-)processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):</p>	<p>Activity data for forest degradation is based on the proxy-based approach presented in GOF-C-GOLD Sourcebook (2016), Section 2.2.2.2: “Indirect approach to monitor forest degradation”. Here, the intact forest concept was used as a proxy to identify forest land without anthropogenic disturbance. The “forest remaining forest” is divided into intact forest (i.e. fully-stocked forest) and non-intact forests (i.e. not fully stocked due to some level of timber exploitation or canopy degradation). The forest cover must still be higher than the minimum of 30% as defined in the Peruvian definition of forest. The intact and non-intact forest data uses the forest layer available from the year 2000 forest layer and remaining forest after annual forest cover loss counts.</p> <p>The intact and non-intact forest areas are defined according to parameters based on spatial criteria that are applied objectively and systematically to the accounting area through GIS. The distance from non-forest edge into the intact or “core” forest was established using the high resolution (1 ha) carbon map of the Peruvian Amazon in Asner et al. (2014). Here, we establish the distance from forest edge where the carbon density plateaus to maximum. The average distance was 210 m from edge into the forest layer. Forest beyond this buffer was considered “core” forest.</p> <p>Then using the Morphological Spatial Pattern Analysis (MSPA) approach in Soille and Vogt (2009), the non-intact forest cover is further subdivided into six categories based on connectivity and isolation from the core forest.</p> <ol style="list-style-type: none"> 1. Perforation: internal perimeter of an isolated forest cover loss. 2. Edge: perimeter of the forest cover. 3. Bridge: forest cover connected to different core areas. 4. Loop: connected to the same core area. 5. Branch: connected only at one end to another non-intact category. 6. Islet: isolated and too small to contain core forest. <p>This proxy is applied to the base year and annual forest cover loss layer individually. However, to avoid double accounting, we count the degraded area, in its non-intact category, only for the year it first appears. In order to ensure that non-intact pixels do not overlap with an area that is deforested in subsequent years, if the “non-intact” pixel is registered as deforested in any year going forward, that pixel is not used in the calculation of degradation, but is included in the calculation of deforestation. Therefore, the proxy provides an annual area of six categories of non-intact or degraded forest.</p>																																																				
<p>Spatial level (local, regional, national or international):</p>	<p>The original forest cover dataset was produced for the entire Peruvian Amazon. The proxy-based approach was applied to the entire annual forest</p>																																																				

	cover dataset. A subset of the geospatial data was clipped for the regional level of San Martin and Ucayali.																												
<p>Discussion of key uncertainties for this parameter:</p>	<p>The proxy-based approach is an estimation of forest degradation and not a direct measurement of forest degradation. It is also not based on field observations. However, it does serve as a consistent estimation of non-intact forest cover as it uses the forest cover/annual loss dataset as its bases.</p> <p>A main source of uncertainty for the analysis of degradation is the distance from forest edge used, which, as mentioned, is based on the the carbon data of Asner et al. (2014). This map has a spatial resolution of 100m (unlike the maps of annual loss and forest base map), meaning that the 210 m distance are approximately 2 pixels of the carbon map, making it insufficient for a robust statistical analysis. Moreover, according to Chaplin-Kramer et al. (2015) the distance should be much wider than a pixel size given that it affects the estimation of the degraded area.</p> <p>Also, performing a fragmentation analysis on a pixel area (0.09 ha) that is considered "Forest", increases the uncertainty and possible methodological limitations of the indirect approach. Similary, it could be incorrect to consider that an isolated pixel of forest loss can generate an area of 13.8 ha of possible degradation.</p> <p>Another source of uncertainty is associated with the lack of a temporal analysis that allows us to understand the evolution of degradation in the forest. At the moment, the proxy is applied every year, but it focuses on identifying the new areas that qualify as degraded. The previously identified areas are not followed up and it is assumed that they continue in the degradation class initially determined.</p> <p>It is expected that with the new degradation method being developed, these souces of uncertainty will be reduced. Annex 14 presents more information on the roadmap of the implementation of this new method.</p>																												
<p>Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:</p>	<p>The estimation of accuracy of the 2008-2017 annual forest degradation data over the accounting area (i.e San Martin and Ucayali as a single unit) followed the stratified simple random sampling approach established in Olofsson et al. (2014) at the 95% confidence interval. This estimation of accuracy for forest degradation was done independently of the estimation of accuracy for deforestation.</p> <p>The accounting area was divided into three strata: Non-intact forest from 2008-2017, stable forest, and stable non-forest. The stable forest accounts for 78.2%, stable non-forest for 15.4% and non-intact forest for 6.4% of the accounting area, respectively. The sample size for stratified random sampling was calculated to be 100 sample units for non-intact forest, 611 for stable forest and 83 for stable non-forest.</p> <table border="1"> <thead> <tr> <th colspan="6">Unbiased accuracy assessment summary table</th> </tr> <tr> <th>Class</th> <th>Adjusted Areas (ha)</th> <th>±95% CI</th> <th>User's Accuracy (%)</th> <th>Producer's Accuracy (%)</th> <th>Overall Accuracy (%)</th> </tr> </thead> <tbody> <tr> <td>Non-Intact Forest 2008-2017</td> <td>931,506</td> <td>213,078</td> <td>47.0</td> <td>49.0</td> <td rowspan="3">88.8</td> </tr> <tr> <td>Stable Non-Forest</td> <td>2,218,561</td> <td>191,183</td> <td>94.9</td> <td>90.4</td> </tr> <tr> <td>Stable Forest</td> <td>11,271,976</td> <td>268,057</td> <td>96.1</td> <td>96.7</td> </tr> </tbody> </table>	Unbiased accuracy assessment summary table						Class	Adjusted Areas (ha)	±95% CI	User's Accuracy (%)	Producer's Accuracy (%)	Overall Accuracy (%)	Non-Intact Forest 2008-2017	931,506	213,078	47.0	49.0	88.8	Stable Non-Forest	2,218,561	191,183	94.9	90.4	Stable Forest	11,271,976	268,057	96.1	96.7
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Emission factors

The forest emission factors used for the construction of the RL are the forest carbon stocks per hectare (tCO₂e ha⁻¹) estimated for the biomass of living trees (see MINAM 2014 and FREL 2016), using the above-ground biomass and calculated with the equation of Mokany et al. (2006) for the below-ground biomass, using a default carbon fraction of 0.47 (IPCC, 2006). A stoichiometric ratio of 44/12 for the conversion of tons of carbon to tons of carbon dioxide equivalent was used.

It is important to mention that the carbon stocks reported in the FREL differ minimally from the stocks used in the RL, due to an error⁸⁰ detected in the values of the below-ground-biomass of the FREL that was properly corrected. The right values are being used in the second BUR and any other official report related to LULUCF emissions. The calculated average carbon stocks per hectare and are shown in Table 8.3.1.

Table 8.3.1. Estimated average forest carbon stocks derived from above-ground (AGB) and below-ground biomass (BGB) per eco-zone (final estimation in tCO₂e ha⁻¹) found in San Martín and Ucayali (from INGEI 2012).

Ecozone	AGB (t m.s. ha ⁻¹)	AGB (tC ha ⁻¹)	BGB (y = 0.489*AGB ^{0.890})		AGB + BGB		
			(t m.s. ha ⁻¹)	tC ha ⁻¹	(t m.s. ha ⁻¹)	(tC ha ⁻¹)	(tCO ₂ e ha ⁻¹)
Accessible highland forest	172.53	81.09	47.88	22.50	220.41	103.59	379.83
Highland, forest, difficult access	200.11	94.05	54.63	25.68	254.74	119.73	439.00
Lowland forest	238.24	111.97	63.80	39.99	302.04	141.96	520.52

The ecozone map was created through a participative process that involved technical experts from MINAM, MINAGRI and the regional government of San Martín. Six ecozones were defined to represent the different forest stratifications at the national scale, which form the basis for the INF. These include Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), Selva Alta de Difícil Acceso (Difficult Access High Jungle), Zona Hidromorfica (Flooded Forest), Costa (Coast) and Sierra (High Mountains) forests. Only the first three ecozones are found in the accounting area.

Peru currently follows the gain-loss method to estimate annual emissions of CO₂ using the sum of losses in the carbon pools on areas of land subject to anthropogenic activity (IPCC Chapter 3: LUCF Sector Good Practice Guidance). Gains are not calculated at this time and therefore the forest loss is considered to be gross deforestation. In this approach, the conversions from forest to other land uses are summed to calculate total deforestation. The gain-loss method multiples areas of land-use change by the difference in carbon stocks per unit area between forest and the new land use using remote sensing (see GFOI Reddcompass; www.redcompass.org). Therefore, we use the following equation to estimate annual carbon stock change in a given pool as a function of gains and losses (IPCC Chapter 3: Equation 3.1.1).

$$\Delta C_i = \sum_j [A_j \bullet (C_i - C_{i,j})]$$

Where: ΔC_i = carbon stock change in the pool (ecozone), tCO₂e yr⁻¹

⁸⁰ In the FREL, the equation from Mokany et al. (2006) for estimating the BGB from the AGB was applied to carbon stocks values given in tonnes of carbon and tonnes of carbon dioxide, while the appropriate use is on biomass stocks in tons of dry matter.

- A area of land, ha
- j forest type (ecozone) j
- C_i rate of gain of carbon stock, $tCO_2e\ ha^{-1}\ yr^{-1}$
- C_L rate of loss of carbon stock, $tCO_2e\ ha^{-1}\ yr^{-1}$

Emission factors are calculated through the following equation.

$$EF_{i,t} = \Delta C_i,$$

Where:

$EF_{i,t}$ Emission factor applicable to the ecozone i , when changing to the land-use category LU in year t ; $tCO_2e\ ha^{-1}$

ΔC_i Change in carbon stock associated to the transition from ecozone i to the land use category LU in year t ; $tCO_2e\ ha^{-1}$. This is equivalent to ΔCLU in equations 2.2 and 2.3 in IPCC, 2006.

These emissions and removals of carbon dioxide are associated with changes in carbon stocks that occur in one hectare that changes from forest land to another land use category (e.g. agriculture, pasture land, secondary vegetation or other land use). In the preceding equation, the carbon stocks of post-deforestation land uses are supposed to be deducted from the original forest carbon stocks. Nonetheless, they are not being accounted in the estimations, as insufficient activity data exists⁸¹ and national carbon stocks are not available. In this way, the emission factors are the same as the initial forest stocks.

We assume that emission factors for a specific ecozone do not change over time and space, as the average carbon stocks per hectare of mature forests are assumed to be constant. The data from the NFI can serve to update emission factor data and verify activity data. Peru is not following the stock change method at this time; methods will be reevaluated once the NFI data becomes available.

Carbon stocks in the living above-ground biomass of trees were calculated using the allometric equations shown in Table 8.3.2. These equations were selected through a collaborative effort of technical experts of MINAM, the National Forest Conservation and Climate Change Mitigation Program (PNCBMCC), the General Directorate for Climate Change and Desertification (DGCCD), the General Directorate of Evaluation, Valuation and Financing of the Natural Heritage (DGEVFPN) and the National Forest Inventory (INF) of the Ministry of Agriculture. The data has been applied to the National FREL (2016) and subsequent reports to the UNFCCC.

Table 8.3.2. Allometric equations and default parameters used for estimating carbon stocks in the living biomass of trees.

Equation or Factor	Application in Peru	Reference
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⁸¹ Land use change maps were produced by the MNCB for the Amazon biome, for periods ranging 1995 to 2016, of which none were validated. These maps show the six land use/cover categories from the IPCC guidelines, but do not account for more detailed strata within each category. More over, an especial cover class, called Secondary Vegetation, is highly uncertain, in the sense that it could include secondary forests, agroforestry systems, perennial crops, agricultural fallows, among other vegetation classes that could not be separated. Considering that the Secondary Vegetation may be the most impacting class for determining net emissions from deforestation, it is of high importance to improve the detection of these areas, in order to get accurate emissions estimates. For this reason, MINAM is developing an analysis that seeks to distinguish the Secondary Forest from other vegetation classes, at the minimum. The mapping results are expected for the second semester of 2019 and limited field work to analyze carbon stocks is expected to be completed by early 2020.

Above-ground biomass in trees (AGB.t)		
$DB * \text{Exp}(-1.239 + 1.980 * \ln(\text{dbh}) + 0.207 * \ln(\text{dbh})^2 - 0.0281 * \ln(\text{dbh})^3)$	Selva Alta	Wet Forest; Chave et al., 2005
$p * \text{Exp}(-1.499 + 2.148 * \ln(\text{dbh}) + 0.207 * \ln(\text{dbh})^2 - 0.0281 * \ln(\text{dbh})^3)$	Selva Baja	Moist Forest; Chave et al., 2005
$6.666 + 12.826 * h^{0.5} * \ln(h)$	Tall Palms (h > 11 m)	Pearson et al., 2005
$23.487 + 41.851 * \ln(h)^2$	Small Palms (h ≤ 11 m)	Pearson et al., 2005
$10^{(0.12 + 0.91 * \log(\text{BA}))}$	Vines	Putz, 1983
Below-ground biomass in trees (BGB.t)		
$\text{BGB.t} = 0.489 * \text{AGB.t}^{0.890}$	All	Mokany et al., 2006
Default parameters		
0.47	Default carbon fraction	IPCC, 2006
0.64	Default wood density	Average
44/12	Stoichiometric ratio to convert tons of C to tons of CO _{2-e}	

Where: DB = Wood density; dbh = Diameter at breast height; h = Tree height; BA = Basal area; AGB.t = Above-ground living tree biomass; BGB.t = Below-ground living tree biomass.

Table 8.3.3. Summary of carbon stocks applied for deforestation emissions.

Description of the parameter including the forest class if applicable:	Carbon stock (applied for deforestation emissions) for the following categories including aboveground and belowground biomass: Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), Selva Alta de Difícil Acceso (Difficult Access High Jungle).
Data unit (e.g. t CO₂/ha):	tCO _{2e} / ha
Value for the parameter:	Values are presented in Table 8.3.1
Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods and results of any underlying studies that have been used to determine the parameter:	The current official forest carbon stocks were obtained from a number of private institutions, governmental and non-governmental organizations, public and academic institutions. Details on location, raw data numbers and standardization can be obtained in MINAM 2014 and the FREL of 2016, where the emission factors were first described in detail and applied. Results from the National Forest Inventory (NFI) will be adopted in the future.
Spatial level (local, regional, national or international):	The emission factors for “forests” are subdivided by eco-zones [i.e Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), and Selva Alta de Difícil Acceso (Difficult Access High Jungle), which were developed for the national level in the NFI and the FREL, but fall within the accounting area.
Discussion of key uncertainties for this parameter:	As described in MINAM (2004) and the FREL (2016), strict quality control was implemented to select only the data that met the minimum quality standards required for estimating carbon stocks. Some of those criteria included availability of complete information (coordinates of plots, desing and size of

	<p>plots, existence of measurement protocols, etc.), consistence with carbon pool definitions used in the analysis (e.g. minimum diameter at breast-high considered for each ecozone), sampled cover type (forest plantations and non-forest covers such as agroforestry systems were excluded). Exclusions were made at individuals and plots levels, depending of the errors detected.</p> <p>In spite of the different sources used to develop the AGB carbon stocks, the uncertainty levels obtained are low. This could be due to the high number of plots employed. The quality of the estimates is also supported by the similarity with the preliminary results of the NFI (first panel).</p> <p>The uncertainties not accounted for come from the applied allometric equations used to estimate the above-ground biomass of the measured trees. The error of the root-to-shoot ratio, in Mokany et al. (2014) was assumed to be similar to the allometric equation from the same authors, given that an estandar error for the equation is not presented in the study.</p>
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	<p>The uncertainties were estimated from the variance of the samples reported in MINAM (2014) of the AGB. For the BGB, the before mentioned parameter was combined with the error reported in Mokany et al. (2014) for the root-to-shoot ratio in tropical forests with more than 125 t/ha. With a Monte Carlo analysis all uncertainties were combined for each ecozone, resulting in 3% of the mean for “Selva Baja”, 7.1% for “Selva Alta de Difícil Acceso” and 7.4% for “Selva Alta Accesible”, at the 95% confidence level.</p>

Table 8.3.4. Summary of carbon stocks applied for forest degradation emissions.

Description of the parameter including the forest class if applicable:	<p>Carbon stock (applied for forest degradation emissions) for the following categories including aboveground and belowground biomass:</p> <p>Selva Baja (Lowland Jungle), Selva Alta Accesible (Accessible High Jungle), Selva Alta de Difícil Acceso (Difficult Access High Jungle).</p> <p>Forest are subdivided into intact (core) forest and non-intact (degraded) forest. The non-intact forests are subdivided into six categories based on connectivity and isolation from the core forest.</p> <ol style="list-style-type: none"> 1. Perforation: internal perimeter of an isolated forest cover loss. 2. Edge: perimeter of the forest cover. 3. Bridge: forest cover connected to different core areas. 4. Loop: connected to the same core area. 5. Branch: connected only at one end to another non-intact category. 6. Islet: isolated and too small to contain core forest. 																																			
Data unit (e.g. t CO₂/ha):	tCO ₂ e/ ha																																			
Value for the parameter:	<table border="1"> <thead> <tr> <th colspan="4">Emission Factor for Degradation (tCO₂)</th> </tr> <tr> <th>Non-Intact</th> <th>Selva Baja</th> <th>Selva Alta Accesible</th> <th>Selva Alta Difícil</th> </tr> </thead> <tbody> <tr> <td>Perforation</td> <td>86.6</td> <td>20.5</td> <td>65.7</td> </tr> <tr> <td>Edge</td> <td>142.8</td> <td>39.5</td> <td>103.4</td> </tr> <tr> <td>Loop</td> <td>223.6</td> <td>122.9</td> <td>94.9</td> </tr> <tr> <td>Bridge</td> <td>200.5</td> <td>113.0</td> <td>152.4</td> </tr> <tr> <td>Branch</td> <td>266.3</td> <td>183.3</td> <td>193.5</td> </tr> <tr> <td>Islet</td> <td>277.1</td> <td>231.3</td> <td>253.2</td> </tr> </tbody> </table>				Emission Factor for Degradation (tCO ₂)				Non-Intact	Selva Baja	Selva Alta Accesible	Selva Alta Difícil	Perforation	86.6	20.5	65.7	Edge	142.8	39.5	103.4	Loop	223.6	122.9	94.9	Bridge	200.5	113.0	152.4	Branch	266.3	183.3	193.5	Islet	277.1	231.3	253.2
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Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods	<p>The indirect method by proxy was used to estimate forest degradation emissions. First, we extracted values from the Peruvian Amazon carbon map of Asner et al. (2014), by forest fragment categories. Note that the annual fragmentation map does not include areas that are eventually deforested in any subsequent year or have been previously identified as a fragment; also, the</p>																																			

and results of any underlying studies that have been used to determine the parameter:	classification of the non-intact category for a given pixel does not change with time. This is done to avoid double carbon accounting. We then determine the average carbon stock for each fragment category. Next, we determine its fraction of the average value per ecozone from the Peruvian Amazon carbon map. Finally, we apply this fraction to the carbon stock value of each ecozone used previously for deforestation emissions.
Spatial level (local, regional, national or international):	The emission factors for are subdivided by eco-zones [i.e Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), and Selva Alta de Difícil Acceso (Difficult Access High Jungle)], which were developed for the national level in the NFI and the FREL, but fall within the accounting area. Emission factors are also differentiated by forest fragment type, which is considered to be a non-intact or degraded forest.
Discussion of key uncertainties for this parameter:	<p>This indirect method is by proxy and therefore does not have the same precision associated with direct measures of forest cover loss or biomass reduction.</p> <p>As in the degradation activity data, two sources of information with different characteristics are being combined. The Asner et al. (2014) of 100m resolution is used to determine carbon stocks from degradation classes that were defined based on 30m resolution maps. In addition, the results are then applied to ground data carbon estimates.</p> <p>A main source of uncertainty is linked to the degradation' activity data uncertainty.</p> <p>The current forest carbon stocks include values from intact and non-intact forests. Similarly, the sample design of the INF does not divide the forest into conservation/degradation states, but notes the forest condition. This will contribute to the implementation of the new degradation method being developed by MINAM.</p>
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	An assessment of the accuracy of the proxy EF was not done, but it is expected that the uncertainties would be high, as it combines multiple data.

Calculation of the average annual historical emissions over the Reference Period

Annual historical emissions from deforestation

The equation used to construct the proposed annual historical emission from deforestation in the context of the ERPD was the following:

$$E_{def,t} = \sum_i^l (A_{def,i,t} * EF_{i,t})$$

Where:

$E_{def,t}$ is the emissions from deforestation in year t ; tCO_{2e} yr⁻¹

$A_{def,i,t}$ is the area deforested in the eco-zone i to establish the new land-use category LU in year t ; ha yr⁻¹

$EF_{i,t}$ is the emission factor applicable to the eco-zone i , when changing to the land-use category LU in year t ; tCO_{2e} ha⁻¹

i is the eco-zone i ; dimensionless

l is the total number of eco-zones; dimensionless

t is a year; dimensionless

LU is one of the non-forest land use categories of IPCC, and includes cropland, grassland, wetland, settlements or other land.

Annual historical emissions from forest degradation

The equation used to construct the proposed annual historical emission from forest degradation in the context of the ERPD was the following:

$$E_{deg,t} = \sum_i^I (A_{deg,i,t} * EF_{deg,i,t})$$

Where:

$E_{deg,t}$ is the emissions from forest degradation in year t ; tCO₂e yr⁻¹

$A_{deg,i,t}$ is the non-intact forest sub-category area in the ecozone i during year t that remains forest and has not been counted as non-intact forest during the extent of the reference period; ha yr⁻¹

$EF_{deg,i,t}$ is the emission factor applicable to the ecozone i to the non-intact forest sub-category that remains forest in year t ; tCO₂e ha⁻¹

i is the eco-zone i ; dimensionless

I is the total number of eco-zones; dimensionless

t is a year; dimensionless

Total annual historical emissions

The total annual historical emission from deforestation and forest degradation was calculated from the following equation.

$$E_{total,t} = E_{def,t} + E_{deg,t}$$

where:

$E_{total,t}$ is the total annual emissions from deforestation and forest degradation in year t ; tCO₂e yr⁻¹

$E_{def,t}$ is the total annual emission from deforestation during year t ; in tCO₂e yr⁻¹

$E_{deg,t}$ is the total annual emission from forest degradation during year t ; in tCO₂e yr⁻¹

The total average annual historical emissions were calculated by summing the annual emissions from deforestation and forest degradation, avoiding double accounting for both types of activity data. It is worth noting that for carbon accounting, loss of carbon from deforestation is considered to be total and instantaneous within the affected area. Also, loss of carbon from forest degradation is a fraction of the carbon density of each ecozone as previously described, and is conservative in that the fraction of carbon density lost does not increase over time and is not recovered due to forest regrowth.

Table 8.3.6. Annual historical emissions from deforestation, forest degradation, biomass burning (i.e. conversion from forest to agriculture or grassland) over the reference period without any adjustments.

Reference Period	Annual historical emissions from deforestation over the Reference Period (tCO ₂ e/yr)	Annual historical emissions from forest degradation over the Reference Period (tCO ₂ e/yr)	Total annual historical emissions (tCO ₂ e/yr)
2008	15,947,638.4	3,492,923	19,440,561.6
2009	28,881,862.3	4,823,623	33,705,485.6
2010	22,883,407.8	3,482,010	26,365,417.3
2011	22,349,202.0	3,342,223	25,691,424.7
2012	24,616,376.5	14,271,586	38,887,962.8
2013	28,151,275.8	11,014,701	39,165,976.8
2014	27,605,941.4	14,716,298	42,322,238.9
2015	24,436,966.1	15,995,273	40,432,239.3
2016	23,736,279.0	12,362,591	36,098,869.6
2017	20,804,936.8	14,955,772	35,760,709.0
Average	239,413,886.1	98,456,999.7	337,870,885.8

8.4 Upward or downward adjustments to the average annual historical emissions over the Reference Period (if applicable)

No adjustment has been applied to the RL.

8.5 Estimated Reference Level

ER Program Reference level

ERPA term year <i>t</i>	Average annual historical emissions from deforestation over the Reference Period (tCO ₂ -e/yr)	Annual historical emissions from forest degradation over the Reference Period (tCO ₂ -e/yr)	Adjustment, if applicable (tCO ₂ -e/yr)	Reference Level (tCO ₂ -e/yr)
2020	23,941,388.61	9,845,699.97	-	33,787,088.58
2021	23,941,388.61	9,845,699.97	-	33,787,088.58
2022	23,941,388.61	9,845,699.97	-	33,787,088.58
2023	23,941,388.61	9,845,699.97	-	33,787,088.58
2024	23,941,388.61	9,845,699.97	-	33,787,088.58

8.6 Relation between the Reference Level, the development of a FREL/FRL for the UNFCCC and the country's existing or emerging greenhouse gas inventory

The Reference Level presented in the ERPD uses the same activity data for forest cover loss and emissions factors for “forest converted to non-forest” in the accounting area than the one used in the building of Peru official FREL. As indicated previously, the same annual forest cover loss dataset is used for national and international MRV reporting for REDD+ related activities and the national Greenhouse Gas Inventory. There was a small, non-statistically significant error in the emission factors used in the FREL (2016), which originated from MINAM 2014 that has now been corrected and is used in all GHG emission reports. Updates to reports submitted to the UNFCCC are scheduled to use the same methodology and carbon accounting.

The RL presented in the ERPD can inform future updates to the FREL and Greenhouse Gas Inventory by providing a roadmap for the development of activity data and emissions factors for degradation of “forest remaining forest” and “forest converted to other land uses”. All current reports submitted to the UNFCCC from Peru only use data from “forest converted to non-forest” due to the extent of national data available during those submissions. The same methodology presented in the ERPD, with adjustments suggested the evaluation process, can be scaled up to the national level as appropriate.

9. APPROACH FOR MEASUREMENT, MONITORING AND REPORTING

9.1 Measurement, monitoring and reporting approach for estimating emissions occurring under the ER Program within the Accounting Area

At a national level, Peru is implementing a National Forest Monitoring System, known as the Forest Cover Monitoring Module (MMCB) coordinated by the National Forest Conservation Program (PNCB) of the Ministry of the Environment. Its main role is to collect and process forest cover change data obtained from remote sensing for national and international reporting, and share information with relevant agencies and the general public through the GeoBosques platform (<http://geobosques.minam.gob.pe>). In addition to forest cover and cover change data, the PNCB is also coordinating the estimation of emission factors (not included in the NFI) used for UNFCCC reporting and other international agreements. Future emission factors related to forest will be derived from information obtained by the National Forest Inventory (NFI) coordinated by SERFOR. The inventory has already completed the first of five stages and the second stage is in progress.

The MNCB is composed of 5 sub-modules:

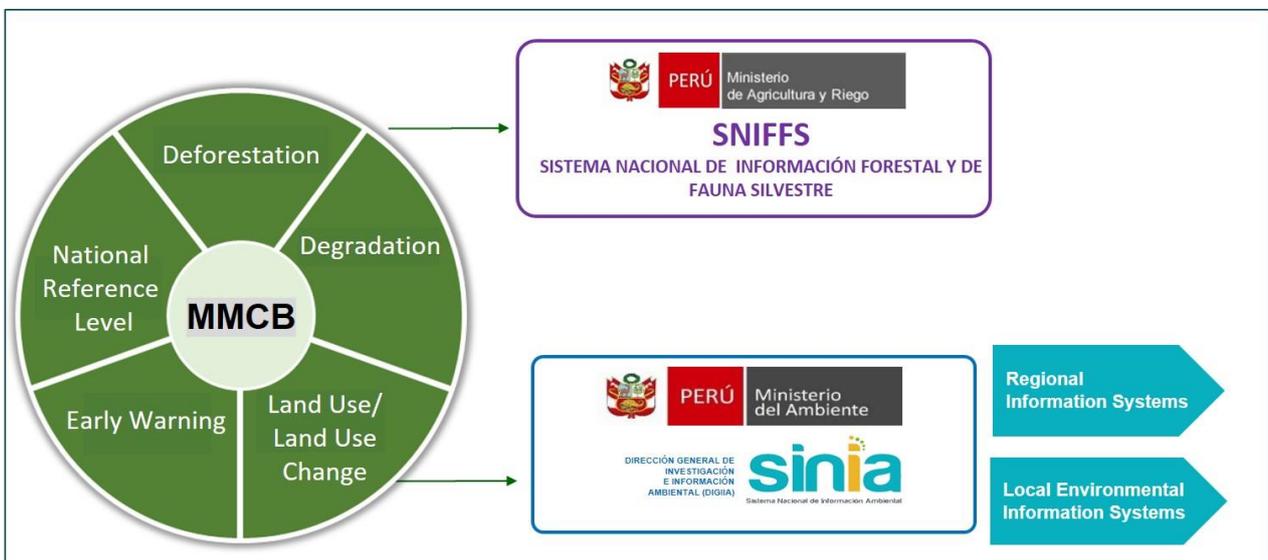
- a) The Deforestation Module generates annual gross deforestation data in coordination with Professor Matt Hansen and the University of Maryland. Data is generated using 30 m Landsat images and is post-processed in coordination with the PNCB and SERFOR, to generate a joint annual report. The focus is primarily on the Peruvian Amazon, but similar data is being generated for the Coastal Dry Forests and Andean Forests.
- b) The Degradation Module generates forest degradation data primarily for the Peruvian Amazon. The current method used in the ERPD is an indirect, proxy method that estimates annual forest degradation associated with new non-intact forest areas in a buffer zone extending from the non-forest-forest boundary into the forest. A “Mixed Approach” using satellite imagery is under development with support from UN-REDD that will be ready at the end of 2020. Its results will be used as the official degradation estimates for the Amazon. More information can be seen in Annex 14.
- c) The Land Use/Land Use Change Module generates land use change data based on the analysis of 30 m Landsat images and IPCC categories and additional sub-categories, including agriculture and other non-forest categories. These estimates are developed independently from those of the Deforestation Module and are considered complementary to the data on forest loss. The focus is primarily in the Peruvian Amazon, where estimates are produced every 3 – 5 years.
- d) The Early Warning Module generates alerts of forest cover loss every 8 to 16 days for the Peruvian Amazon, using 30 m Landsat images. Early warning data and reports are developed and

communicated by the MNCB and PNCB through the GeoBosques portal. In addition, the PNCB is in the latter developing stages of a community monitoring component, funded by USAID, which will include cell phone app and drone data from associated communities that will appear in GeoBosques.

- e) The National Reference Level Module coordinates activity and carbon emissions data for MRV and related activities. This module ensures that the information is coherent, transparent, and consistent for international reporting related to emissions and emission reductions from deforestation and land use change.

The sub-modules of the MNCB supply deforestation data as well as other land use data to the National Forestry and Wildlife Information System (SNIFFS) of MINAGRI and the National Environmental Information System (SINIA) of MINAM (Figure 9.1.1).

Figure 9.1.1 the relationship between MNCB, SNIFFS, and SINIA



Emissions Estimation

Peru’s MNCB and MRV are in accordance with Criterion 5 of the Carbon Fund Methodological Framework, which is based on IPCC 2006 guidelines. Therefore, the methodology will guarantee comparable and consistent measurements during the periods evaluated.

Estimates of forest emissions will be calculated from activity data derived from annual forest cover loss of the Peruvian Amazon using Landsat images of 30 m spatial resolution. Data are generated in conjunction with the University of Maryland, with financial coordination from SilvaCarbon (a U.S. government interagency technical cooperation program). Since 2015, annual statistics and reports have been presented in cooperation between PNCB, MINAM, and SERFOR. Data are freely available on the GeoBosques website (<http://geobosques.minam.gob.pe>).

Emission factors used to estimate the Reference Level and carbon emission for the ERPD were estimated from forest inventory data obtained from a number of private institutions, governmental and non-

governmental organizations, and public and academic institutions (see MINAM 2014⁸², FREL 2016⁸³). Since the data were developed from different sources, a strict quality control procedure was applied to exclude plots with methodological issues (e.g. incompatible linear plots), plots outside forests, missing data, inconsistent protocols and data errors. Therefore, only 1152 plots in the Peruvian Amazon were included.

A map of ecozones was created by the National Forest Inventory (NFI) to differentiate between broad forest types. The ecozones were created through a participative process that involved technical experts from MINAM, MINAGRI and the regional governments of San Martín and Madre de Dios. Six ecozones were developed, at the national scale, to represent different types of forests. These include Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), Selva Alta de Difícil Acceso (Difficult Access High Jungle), Hidromorfica (Flooded Forest), Costa (Dry Coastal Forests) and Sierra (High Mountain Forests). Only the first three ecozones are found in the accounting area.

SERFOR is the government organization responsible for the development and execution of the NFI. The NFI is currently working on the second of five stages of the national forest inventory; each stage is estimated to take a year to complete. Approximately 1,288 sampling plots are found in the Peruvian Amazon; these plots are independent of the plots used for the current emission factors. Therefore, emission factors may change as a result of future updates to the NFI. Should changes be required during the reference period, these changes will be incorporated not only to the Reference Level, but all reports submitted to the UNFCCC.

Table 9.1.1. Summary table of the procedures used to generate activity data during the MRV.

Parameter:	Activity Data
Description:	Annual deforestation generated for the entire Peruvian Amazon.
Data unit:	ha/yr
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods	<p>Activity data are estimated following good practices of GFOI (2016)⁸⁴. Annual forest cover loss (i.e. gross deforestation) is obtained from Landsat images of 30 m spatial resolution. Total deforestation is obtained from summing the 30 m x 30 m pixels that experience a spectrally identified forest cover loss in a given year. To register deforestation, pixels are selected based on quality (e.g. no cloud cover or other atmospheric contamination) and searched from the end (i.e. December 31) to the beginning of the year until a “quality” pixel is selected. Annual forest loss from river meandering is excluded from the total count to approach anthropogenic forest loss. Data for the accounting area is geospatially extracted from the Amazon data set.</p> <p>Uncertainty is calculated following a simple stratified random sampling, following Olofsson et al., 2014⁸⁵. Strata include forest loss, stable non-forest, and stable forest. The uncertainty calculation is only applied to the activity</p>

⁸² Ministerio del Ambiente (MINAM), 2014a. Estimación de los contenidos de carbono de la biomasa aérea en los bosques de Perú. Ministerio del Ambiente, Programa Nacional de Conservación de Bosques para la Mitigación del Cambio Climático, MINAM, Lima (Perú), 68 p.

⁸³ Peru's submission of a Forest Reference Emission Level (FREL) for reducing emissions from deforestation in the Peruvian Amazon (2016).

⁸⁴ GFOI 2016, Integration of remote-sensing and ground-based observations for estimation of emissions and removals of greenhouse gases in forests: Methods and Guidance from the Global Forest Observations Initiative, Edition 2.0, Food and Agriculture Organization, Rome.

⁸⁵ Olofsson P., G. M. Foody, M. Herold, S.V. Stehman, C.E. Woodcock & M.A. Wulder. 2014. Good practices for estimating area and assessing accuracy of land change. Remote Sensing of Environment 148:42-57.

will be approved during the Term of the ERPA	data from within the accounting area and is not combined with activity data for forest degradation.
Frequency of monitoring/recording:	Annually. The accounting period of forest loss begins in January and ends in December of the accounting year.
Monitoring equipment:	At present, MMCB and PNCB possess robust and modern technological infrastructure, which is able to analyze and store the information necessary to produce emission reports every year. The annual forest cover loss data is developed in collaboration with Professor Matt Hansen of the University of Maryland (UMD). SilvaCarbon has coordinated funding for technical assistance from UMD to end of year 2020. Additional funding for monitoring has been secured through R-PP (Readiness Preparation Proposal) and UN-REDD.
Quality Assurance/Quality Control procedures to be applied:	<p>Quality assurance and control procedures involve a post-processing visual assessment first by the MMCB, PNCB and UMD technical team. Then, an additional review is performed by a panel of technical experts from SERFOR. Any adjustments are applied during the review period before the final co-publication of results by MINAM and MINAGRI.</p> <p>Uncertainty analysis of the data is performed and the activity data area is estimated to a 95% significance level. These areas are used in the calculation of emissions and their errors are incorporated in the Monte Carlo simulations.</p>
Identification of sources of uncertainty for this parameter	<p>The uncertainty of the activity data is primarily associated with the forest base map and secondarily with the correct detection of forest cover loss.</p> <p>Base Map: The spectral classification of mature forest, during the base year (2000), may be confused with mature secondary forest, initially disturbed prior to the year 2000, and mature forest plantations, which may have also been planted before the benchmark year. Although there is little information on the geospatial extent of these classes, Peru considers their extent in the year 2000 is limited, especially of forest plantations. There are no current methodologies to distinguish among these classes in Landsat or other satellite images from the early 2000's.</p> <p>Correct Detection of Forest Cover Loss: This uncertainty is controlled in post-processing, where any adjustments are first conducted visually by UMD and then by a panel of national technical experts in MMCB, PNCB and SERFOR. Adjustments are performed after comparing results with Landsat and higher resolution images, such as Sentinel-2 and Planet.</p>
Process for managing and reducing uncertainty associated with this parameter	<p>Uncertainty of activity data is minimized by taking into account the following best practices:</p> <p>Higher resolution images are used during validation with Sentinel-2 (10 m spatial resolution) and Planet (3-5 m spatial resolution) images.</p> <p>National panel of technical experts in MMCB, PNCB and SERFOR review the geospatial results at post-processing.</p> <p>Before beginning the final analysis and statistics, the data is reviewed for any anomalies.</p> <p>In addition, MINAM is working on developing a Secondary Forest detection that aims to identify previously deforested areas where forest is recovering. At the moment, the methodology is being developed and preliminary results are expected by the second semester of 2019. The progress is being shared with the technical support group conformed for the degradation monitoring, where many public and non-public institutions participate and give their feedback. Moreover, NFI plots located in secondary forest, as noted during the field work, will serve for the validation of the maps and as additional information for estimating adequate carbon stocks. Field work will also be</p>

	carried out after finalizing the mapping stage. Final results will be available in the first trimester of 2020.
Any comment:	<p>Additional forest cover loss monitoring is conducted with data from the Early Warning System, which is independently generated and available from the GeoBosques platform:</p> <p>http://geobosques.minam.gob.pe/geobosque/visor/</p> <p>These early warnings are conducted every 8 to 16 days using Landsat 30 m spatial resolution images and verified using higher resolution images from Sentinel-2 and Planet.</p>

Table 9.1.2. Summary table of the procedures used to generate forest degradation activity data during the MRV.

Parameter:	Activity Data
Description:	Annual forest degradation generated for the entire Peruvian Amazon.
Data unit:	ha/yr
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	<p>Currently, activity data for forest degradation are estimated following good practices of GFOI (2016) and GOF-C-GOLD (2016). Forest degradation is estimated by proxy and therefore relies on the annual forest cover loss (i.e. gross deforestation) obtained from Landsat images of 30 m spatial resolution.</p> <p>To obtain forest degradation area, the forest class is subdivided into intact (core) forest and non-intact (degraded) forest. The non-intact forest is subdivided into six (6) categories based on connectivity and isolation from the core forest. Forest class (i.e. pixel classified as forest) that is eventually lost due to deforestation is taken out of the forest degradation accounting. Forest degradation area (pixel), for the purpose of estimating emissions, is only counted once to avoid double accounting. Data for the accounting area is geospatially extracted from the Amazon data set.</p> <p>Once the process for developing a more robust method for detecting degradation ends, the new degradation estimates will be used to update the RL and to monitor in the accounting period. More information on the methodology, called “Mixed Approach” is presented in Annex 14.</p> <p>Uncertainty is calculated following a simple stratified random sampling, following Olofsson et al., 2014. Strata include non-intact forest, stable non-forest, and stable forest. The uncertainty calculation is only applied to the activity data from within the accounting area and is done independently from the deforestation uncertainty calculation.</p>
Frequency of monitoring/recording:	Annually. The accounting period of forest degradation begins in January and ends in December of the accounting year.
Monitoring equipment:	<p>The MMCB and PNCB possess robust and modern technological infrastructure for the development, analysis, and storage of forest degradation by proxy. Reports on forest degradation emissions can be produced annually. At the moment, the estimation by proxy will rely on the annual deforestation data is developed in collaboration with Professor Matt Hansen of the University of Maryland (UMD). SilvaCarbon has coordinated funding for technical assistance from UMD to end of year 2020, and will very likely go beyond this timeline.</p> <p>Likewise, the Peru UN-REDD program is supporting the development of the new methodology for monitoring degradation. Team and equipments are in place up to 2020 to produce de historical data on degradation and the capacity building to replicate the analysis periodically.</p>

Quality Assurance/Quality Control procedures to be applied:	Quality assurance and control procedures involve a post-processing visual assessment by the MNCB and PNCB technical team. Uncertainty analysis of the forest degradation data is performed and the activity data area is estimated to a 95% significance level. These areas are used in the calculation of emissions and their errors are incorporated in the Monte Carlo simulations.
Identification of sources of uncertainty for this parameter	Since the current method is by proxy, sources of uncertainty are directly related to the deforestation activity data. The uncertainty of the activity data is primarily associated with the forest base map and secondarily with the correct detection of deforestation, which was discussed previously in Table 9.1.1. In addition, the proxy method only uses distance from deforestation and non-forest and does not directly detect forest degradation events. This may ultimately cause an overestimation of forest degradation area.
Process for managing and reducing uncertainty associated with this parameter	Uncertainty of forest degradation activity data is minimized by taking into account the following best practices: <ul style="list-style-type: none"> • Higher resolution images are used during uncertainty analysis with Sentinel-2 (10 m spatial resolution) and Planet (3-5 m spatial resolution) images. • Before beginning the final analysis and statistics, the data is reviewed for any anomalies. The main uncertainties seen in the indirect approach are being tackled in the new methodology “Mixed Approach”.
Any comment:	The Mix Approach will replace the indirect estimation by proxy. Results are expected within two years and will also be used to update the National Forest Reference Emission Level.

Table 9.1.3. Summary of the procedures for the generation of Emission Factors.

Parameter:	Emission Factors
Description:	Emission factors (EF), which include aboveground and belowground biomass, are generated for the following ecozones within the accounting area: Selva Baja (Lowland Jungle) Selva Alta Accessible (Accessible High Jungle) Selva Alta Difícil (Difficult Access High Jungle) These emission factors are used in the ERPD, the National Reference Emission Level (2016), the Third National Communication (2016), the National Greenhouse Gas Inventory, and the Declaration of Intent between Peru, Norway and Germany.
Data unit:	t C/ha
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the	In 2014, the INF divided Peru into six ecozones for forest type stratification based on five criteria: physical geography, physiognomy, floristic, carbon storage capacity, and accessibility. The ecozones include Selva Baja (Lowland Jungle), Selva Alta Accessible (Accessible High Jungle), Selva Alta Difícil (Difficult Access High Jungle), Hidromorfica (Flooded Forest), Costa (Coastal Forest) and Sierra (High Mountain Forest). Only the first three ecozones are found in the accounting area. The current emission factors used to estimate the Reference Level were estimated based on forest inventory data obtained from a number of private institutions, governmental and non-governmental organizations, public and academic institutions (see MINAM 2014, FREL 2016). Since the data were

data or methods will be approved during the Term of the ERPA

developed from different sources, a strict quality control procedure was applied to exclude plots with methodological issues (e.g. incompatible linear plots, plots outside forests, missing data, inconsistent protocols and data errors). A total of 1,152 plots in the Peruvian Amazon were included.

The carbon stock finally assigned to each ecozone was approved through a participative process that involved technical experts from MINAM, MINAGRI, the regional governments of San Martin and Madre de Dios, academic institutions, and civil society.

Carbon stocks in the living above-ground biomass of trees were calculated using the allometric equations below. These equations were selected through a collaborative effort of the technical teams of PNCB, the General Directorate for Climate Change and Desertification (DGCCD), the General Directorate of Evaluation, Valuation and Financing of the Natural Heritage (DGEVFPN) and the INF. The INF will also use these equations to generate biomass estimates based on tree data.

Allometric equations and default parameters used for estimating carbon stocks in the living biomass of trees for the three ecozones in the accounting area are shown below.

Equation or Factor	Application in Peru	Reference
Above-ground biomass in trees (AGB.t)		
$p * \text{Exp}(-1.239 + 1.980 * \ln(\text{dbh}) + 0.207 * \ln(\text{dbh})^2 - 0.0281 * \ln(\text{dbh})^3)$	Selva Alta	Wet Forest; Chave et al., 2005
$\text{DB} * \text{Exp}(-1.499 + 2.148 * \ln(\text{dbh}) + 0.207 * \ln(\text{dbh})^2 - 0.0281 * \ln(\text{dbh})^3)$	Selva Baja	Moist Forest; Chave et al., 2005
$6.666 + 12.826 * h^{0.5} * \ln(h)$	Tall Palms (h > 11 m)	Pearson et al., 2005
$23.487 + 41.851 * \ln(h)^2$	Small Palms (h ≤ 11 m)	Pearson et al., 2005
$10^{(0.12 + 0.91 * \log(\text{BA}))}$	Vines	Putz, 1983
Below-ground biomass in trees (BGB.t)		
$\text{BGB.t} = 0.489 * \text{AGB.t}^{0.890}$	All	Mokany et al., 2006
Default parameters		
0.47	Default carbon fraction	IPCC, 2006
0.64	Default wood density	Average
44/12	Stoichiometric ratio to convert tons of C to tons of CO ₂ e	

	<p>Where: DB = Wood density; dbh = Diameter at breast height; h = Tree height; BA = Basal area; AGB.t = Above-ground living tree biomass; BGB.t = Below-ground living tree biomass.</p> <p>At present, Peru does not have official allometric equations for tree biomass calibrated with national data.</p>
Frequency of monitoring/recording:	Emission factors will be updated from data received by the NFI. The NFI is culminating the first of five sequential stages, therefore the complete 5-stage data collection should culminate in 2022. However, EFs will be updated as data from each stage become available.
Monitoring equipment:	SERFOR is responsible for updating the NFI. SERFOR cooperated with FAO and the U.S. Forest Service to design and initially execute the NFI.
Quality Assurance/Quality Control procedures to be applied:	Since the emission factors for the estimation of forest emissions during the monitoring events will be identical to those used in the construction of the reference level, it is not necessary to apply a QA/QC procedure.
Identification of sources of uncertainty for this parameter	<p>Errors are associated with the following:</p> <ul style="list-style-type: none"> * Measurement errors (e.g. field measurement of tree diameter at breast height - DBH). * Prediction errors of the allometric equations used to estimate biomass due to uncertainty related to model residuals and model parameters. * Sampling error. * Errors associated with the different parameters used in the estimation of emissions, such as the carbon fraction of the material in question.
Process for managing and reducing uncertainty associated with this parameter	Since the emission factors for the estimation of forest emissions during the monitoring events will be identical to those used in the construction of the reference level, it is not necessary to apply a process for managing and reducing uncertainty.
Any comment:	The NFI is currently culminating the first of five stages for the Peruvian Amazon. The estimated total number of NFI plots for this biome is 1,288; they will be used to estimate above- and below-ground biomass only. These plots are independent of the plots used for the current emission factors. Therefore, emission factors may change as a result of future updates from the NFI.

9.2 Organizational structure for measurement, monitoring and reporting

Organizational Structure

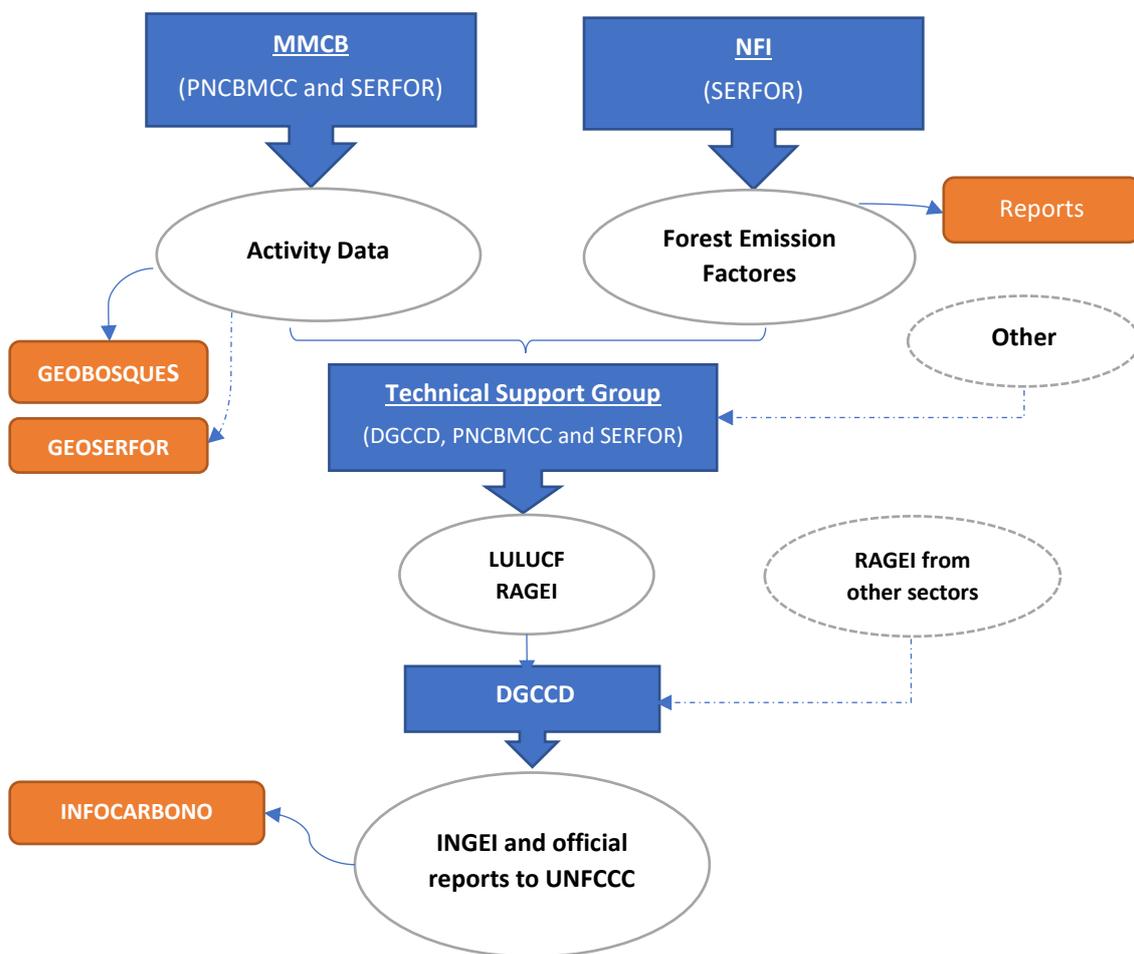
Peru is developing an inter-institutional network for forest monitoring, with formally designated roles and responsibilities, some of which are currently operational. The overarching government ministries overseeing development and implementation are MINAM and MINAGRI. Key internal entities and their responsibilities include the following:

- PNCB: Responsible for running the MNCB, in charge of the production, quality control and verification of activity data used in the estimation of reference levels. Coordinates with SERFOR as part of its responsibilities. Additionally, responsible of official publication of activity data.
- General Directorate of Climate Change and Desertification: Responsible for coordinating and submitting official reports to the UNFCCC.
- SERFOR: Execution of the National Forestry Inventory (NFI) whose data will be used to update the emission factors, once the information becomes available. Participates in the revising and approval of activity data produced by MNCB.

The overarching program for the collection, evaluation and systematization of national information related to the emission and removal of greenhouse gases is the INGEI (National Greenhouse Gas Inventory established in 2014). This information is transparently distributed through the InfoCarbono platform (<http://infocarbono.minam.gob.pe/>). The INGEI contributes to the formulation of policies, strategies and development plans that reduce greenhouse gas emissions and helps fulfill the commitments assumed by Peru with the UNFCCC and the Kyoto Protocol. Each sector provides an annual report on greenhouse gas emissions, known in Peru as RAGEI, which is necessary for updates to the INGEI. Annual reports for Land Use, Land Use Change and Forestry (LULUCF) will begin in 2019, with PNCB, SERFOR and the General Directorate of Climate Change and Desertification (DGCCD) forming the technical support group.

The MNCB, which is housed within the PNCB, became official in 2015 and is responsible for generating the activity data for the national FREL/FRL. In addition, these activity data have been used by MINAM for other submissions to the UNFCCC, including the BUR, National Communications, and INGEI. The PNCB is responsible for publishing the official annual deforestation area for MINAM. Final quality control, adjustments to activity data, and official publication on deforestation are coordinated between the PNCB and SERFOR. The data presented by the PNCB and SERFOR supplements the information provided by SINIA (National System of Environmental Information) of MINAM and the SNIFFS (National Forest and Wildlife Information System) of MINAGRI.

Figure 9.2.1 Path of information development from collection to publication and institutions involved



For emissions and carbon accounting of organizations, MINAM proposes the Registry of Organizational GHG Inventories, known as the Peru Carbon Footprint. This registry will be designed to facilitate reporting by sector and geography, promote the development of a voluntary domestic carbon market that contributes to compliance with the NDC, and be compatible with InfoCarbono and the National Registry of Mitigation Measures (NRMM).

The NRMM, under development, was established by regulations of the new Framework Law on Climate Change, with the objective of collecting and managing information on the status of emission reductions by mitigation measures. It is expected this registry will help avoid double counting of emission reductions and ambiguous ownership status of the same; it will also assure quality, transparency, and traceability of the registration, approval, transfer and retirement of emission reductions and will help ensure bottom-up compliance of the NDCs as well as the monitoring of progress of NAMAs. This registry supersedes all other registries that were implemented for REDD+ and will be a registry for all carbon accounting across sectors. More details are explained in section 18.2.

Responsibilities and Function

Table 9.2.1 lists institutional functions and internal entities related directly or indirectly to MRV, monitoring, and the generation of emission reductions reports to the ER Program.

Table 9.2.1. Institutions involved in MMRV.

Institution	Internal Entity	Responsibility and Function
MINAM	MMCB	Affiliate of the PNCB. Generates official deforestation data for the FREL/FRL. Develops data for land use change and degradation for the FREL/FRL. Processes and analyzes data. Generates reports on uncertainty. Emits estimates of forest emissions and removals. Responsible for Monitoring and the MRV system for REDD+. First line of quality control for activity data and emission/removal calculations due to the addition or loss of forest cover.
	PNCB	The Vice-minister of Strategic Development of Natural Resources is the executive coordinator of the program. Responsible for the Mechanism of Conditional Direct Transfers (known as TDC) with native communities, the first payment for ecosystem services/conservation program in Peru. Responsible for carbon accounting data included in the registry. Responsible for the data for the FREL/FRL. Responsible for the GeoBosques platform. Receives feedback from the regions and other information users. Makes public information, maps, and protocols. Publishes the official deforestation data in coordination with SERFOR.
	DGCCD	REDD+ focal point for the UNFCCC Responsible for submission of reports to UNFCCC, including National Reference Line, BUR, National Communication, etc.

Institution	Internal Entity	Responsibility and Function
		Responsible for the National Greenhouse Gas Inventory. Responsible for coordinating the Joint Declaration of Intent of Peru, Norway, and Germany. Responsible for the submission of the ERPD.
	SINIA	Information network coordinated by MINAM. Promotes the consolidation of environmental information from different sectors. Systemizes information into environmental statistics, documentary repository, environmental regulations, and thematic maps.
MINAGRI	NFI	Activity of SERFOR. Selects the forest sampling design and permanent plots. Carries out the forest inventory. Processes and analyzes data. Calculates biomass and carbon stocks. Calculates changes in stocks over time. Generates the report on uncertainty. Will emit the official emission factors in the near future.
	SERFOR	Organization affiliated with MINAGRI. Responsible for the SNIFFS. Responsible for the management of forest concessions. Monitors forest fires. Publishes the official deforestation data in coordination with PNCB.
	SNIFFS	Network for the management of wildlife and forestry information coordinated by SERFOR. Contains modules for inventory, satellite monitoring and control. Consolidates and provides information from the forestry sector.

Reporting Data

All activity data generated by the MNCB are submitted to the PNCB and are distributed via GeoBosques as processed geospatial data, reports and interactive graphs. The PNCB and SERFOR jointly publish the official report on annual deforestation. The official reports and statistics are also available through both SINIA and SNIFFS. Processed geospatial data and satellite image mosaics are available either through direct download through GeoBosques or by request to the PNCB for independent validation and analysis.

Building on the Existing System

Activity data for the accounting area is derived from annual deforestation estimations derived from a methodology that has been applied for over 4 years in Peru, in collaboration with the University of Maryland. There is no change in calculating and applying emission factors compared to previous national and international reports.

Nonetheless, development of the activity data for the ERPD has provided an opportunity to estimate forest degradation area and emissions for the accounting area by proxy. This experience is being used as inputs to help develop a roadmap for an estimation of forest degradation for the entire Peruvian Amazon

using data currently available from GeoBosques (see Annex 14). The methodology by proxy allows for a relatively quick estimate of non-intact forest and the fraction of carbon emissions that may result from different intensities of forest fragmentation. It also will aid in stratifying forests for the direct monitoring of forest degradation, which can be costly and more time consuming.

Early Warning Module (System) for Deforestation

It is worth noting that an operational near-real time Early Warning System using high resolution satellite images is currently available for the Peruvian Amazon. This tool provides a quick accounting of deforestation over the accounting area and is available online as a transparent information portal. The Early Warning Module is part of the MNCB, which is currently housed in the PNCB. Deforestation alerts for the Peruvian Amazon are generated 8 to 16 days, using spectral changes detected in 30 m Landsat images. Alerts are generated entirely “in-house” at the facilities of the PNCB since 2017. In addition, higher spatial resolution images, namely Sentinel-2 (10 m spatial resolution) and Planet (3-5 m spatial resolution), are used to validate alerts and report to interested parties.

Community monitoring will also be a component of the early warning module with images and data collected through cell phone app and drones available to communities subscribed to the PNCB. This initiative originally piloted in the central Peruvian Amazon and is now in the latter stages of software development and enhancement to be available through GeoBosques. Funding is provided through USAID.

In addition to that, greater efforts are being made on community monitoring with the support of the Peruvian UN REDD Program. The aim is to work with thirteen regional indigenous organizations and their local bases, chosen in coordination with national indigenous organizations, in the development of protocols of community monitoring and their implementation in the field.

Early alert data are available for download or as an automatic email alert for areas of interest, such as a predefined location or a customized polygon, through the GeoBosques portal (<http://geobosques.minam.gob.pe/geobosque/visor/>).

Development of Forest Degradation Data: Direct Method

The direct method of detecting and measuring forest degradation will leverage vegetation indices and the physical properties at the pixel level. Advances in satellite remote sensing techniques have improved the possibilities of detection, mapping and monitoring perturbations in forests, with Spectral Mixture Analysis (SMA) being the most promising methodology. From SMA it is possible to obtain information at the sub-pixel level from select spectra, known as *endmembers*, defined by the wavelengths detected and the number of bands of the sensor. Landsat images are expected to be the main source of satellite imagery information. The generated information will be incorporated into an analysis from seasonal (e.g. BFAST, CCDC, YATSM) and non-seasonal (e.g. PVts) approaches for a robust analysis of forest disturbance monitoring during the period from the year 2000 to 2017 for the entire Peruvian Amazon. A validation component with field data is being developed with a stratified random design. The field data will be obtained from panel 2 of the INF and the measurement of new parcels, which will also provide information on the activities of degradation, history of the affected areas, floristic composition and biomass. This data will also serve as the basis for the estimation of new emission factors. Uncertainty

analysis of uncertainty will follow the good practice guidance proposed by GFOI (2014) and Olofsson et al. (2014). Preliminary results of Amazon wide forest degradation mapping, which included the accounting area, is expected by December 2019. The validation of results will be performed during the first semester of 2020, which will enable the production of the Forest Emission Reference Level of degradation for the Amazon and the update of the degradations estimates in the ER Program Reference Level.

9.3 Relation and consistency with the National Forest Monitoring System

The data used to estimate emissions are generated by the National Forest Monitoring System, known as MNCB (Módulo de Monitoreo de Cobertura de Bosques), coordinated by the National Forest Conservation Program (PNCB) of the Ministry of the Environment. MNCB's data on deforestation, degradation and other land use changes in the Peruvian Amazon are used for reports to the UNFCCC, including the National Reference Emission Line, National Greenhouse Gas Inventory, Biennial Update Report, among others. The data are generated following the good practices and guidelines established by the IPCC for forest monitoring. Although current data have been developed for the Peruvian Amazon, the MNCB is developing similar data for the remaining coastal dry forests and Andean forests.

The national monitoring and MRV systems are based on the same methodologies for generating information, the pre- and post-processing of data, and verification by technical experts in the PNCB and SERFOR. Processed data is freely available in the GeoBosques portal (<http://geobosques.minam.gob.pe>) along with regional statistics and analysis.

10. DISPLACEMENT

10.1 Identification of risk of Displacement

The main drivers of deforestation in the accounting area, San Martin and Ucayali, includes the economic undervaluing of the forest, which leads to illegal logging, small scale and subsistence agriculture and land speculation. In addition, coherence gap among policies, policy gaps, land with unassigned rights and other indirect drivers exacerbate the magnitude of deforestation and forest degradation in these regions. This has led to a high forest loss in lands with unassigned rights and permanent production forests, in contrast to areas with designated land rights and nationally protected areas.

The Program's response to deforestation is to increase productive opportunities, control land use, and incentivize better land use practices. These interventions result in the stabilization of land use instead of fomenting displacement. However, under some conditions, a slight possibility of displacement as a result of Program interventions exists.

The interventions most likely to cause displacement include: 1) strengthened monitoring, control, and application of the law (i.e. affects mainly migrants, invaders, land speculators). This is a low to medium potential impact, depending on how laws are applied. 2) Establishment of agricultural or forestry projects on degraded lands (i.e. farmers would sell their lands and might migrate to other areas). This has a low to medium potential impact. 3) The exclusion of farmers from Program activities, for any number of factors (e.g. low resources, non-conformance with selection criteria, location outside the area of

influences of projects, etc.). This is a low probability, since these farmers are likely to continue traditional practices instead of migrating to other lands. In general, the improvement of enabling conditions and productive opportunities by the Program are likely to stabilize populations instead of forcing out-migration, and thus should reduce the possibility of displacement.

Non-intervention related reasons for displacement may include climate change. Increasing temperatures as a result of climate change may increase elevation limits for coffee, and may permit displacement to higher elevation zones (greater than 2500 masl)⁸⁶. The impacts of climate change on rainfall are variable, with increases expected in the Amazon-Andes transition zone, and decreases in western Ucayali and central San Martín⁸⁷. The latter may affect displacement of cocoa farmers to other lowland Amazon regions.

In order for displacement of emissions to occur, emigrants need to move to other forested areas, which in the Peruvian context is essentially limited to other Amazon regions or the Amazon-Andean transition zone. This displacement will be limited altitudinally by the bioclimatic needs of coffee, cacao and oil palm vs. the climatic characteristics of potential reception zones. Most commercial tropical crops are not usually found above 2500 m in elevation due to non-optimal bioclimatic conditions, including low nighttime temperatures, decreasing humidity and precipitation. The Sierra ecozone experiences elevated amounts of UV radiation and daily near-freezing nighttime temperatures that excludes growth of commercial tree species and tropical crops.

At lower elevations, displacement from San Martín and Ucayali to neighboring regions will be hindered by surrounding natural protected areas where forest protection exists and deforestation rates are low. The main areas of potential risk of displacement lies in the region between northern San Martín and Loreto, the areas between San Martín and Ucayali (towards Loreto and towards Huanuco), and the region between Ucayali, Madre de Dios and Cusco (Figures 10.1.1 – 10.1.3). These areas have the most similar physical and bioclimatic conditions that favor commercial tropical agriculture (i.e. lowland jungle and accessible mountainous areas), and lack the barriers of protected natural areas.

Figure 10.1.1 the border between San Martín and Loreto, with a 10 and 20 km buffer for reference purposes, showing areas with no assigned rights and deforestation in 2008-2017.

⁸⁶ Robiglio, V; Baca, M; Donovan, J; Bunn, C; Reyes, M; Gonzáles, D; Sánchez, C. 2017. Impacto del cambio climático sobre la cadena de valor del café en el Perú. ICRAF Oficina Regional para América Latina, Lima, Perú & CIAT Centro Internacional de Agricultura Tropical, Cali, Colombia..

⁸⁷ World Bank 2019. <https://climateknowledgeportal.worldbank.org/country/peru/climate-data-projections>

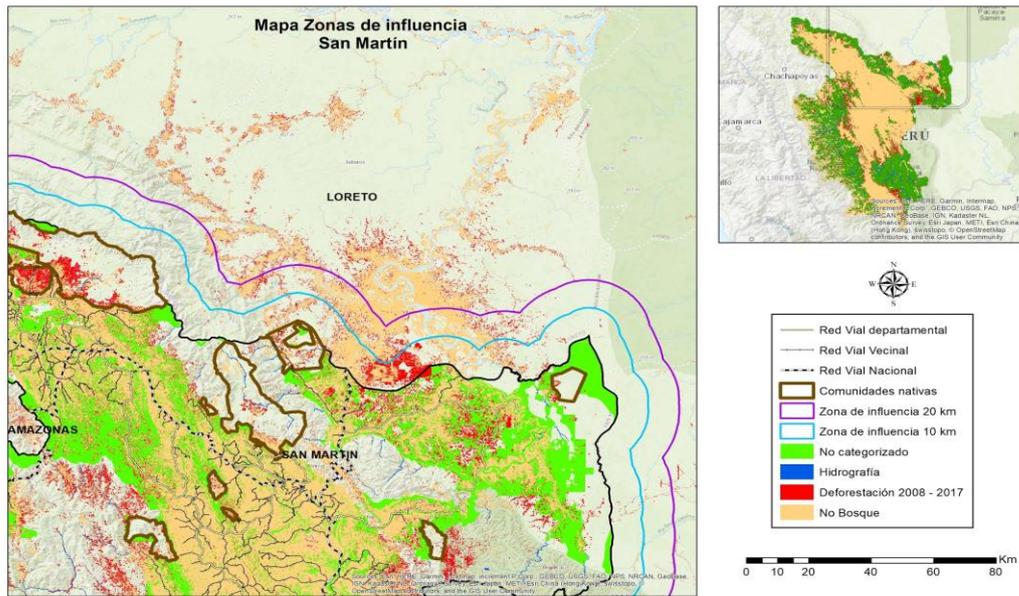


Figure 10.1.2 The area between San Martín and Ucayali (with neighboring regions of Loreto and Huanuco), also known as the “selva central”, with a 10 and 20 km buffer for reference purposes, showing areas with no assigned rights and deforestation in 2008-2017.

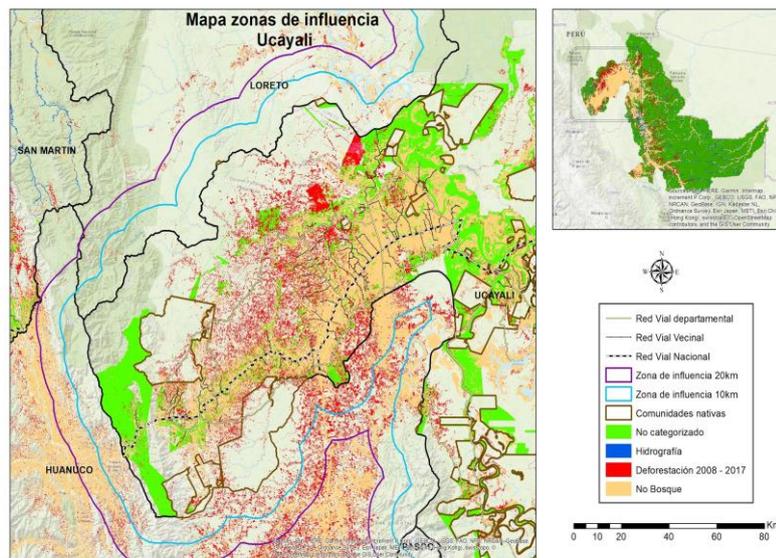
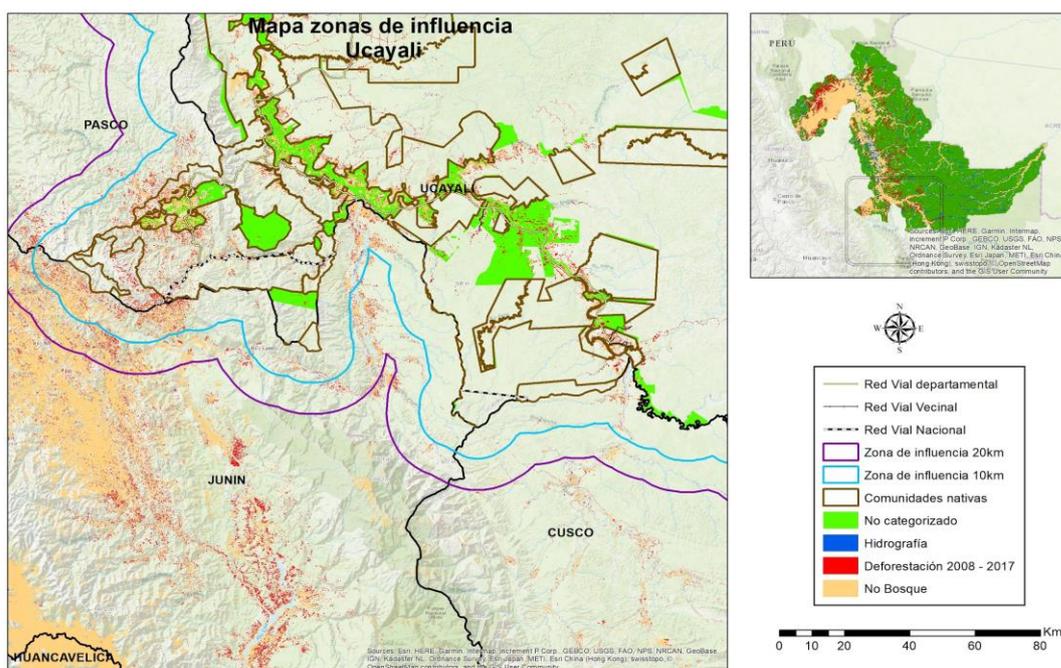


Figure 10.1.3 the area southeast of Ucayali, neighboring Cusco and Madre de Dios, with a 10 and 20 km buffer for reference purposes, showing areas with no assigned rights and deforestation in 2008-2017.



Examination of historical migration data from San Martin and Ucayali to Loreto and Huanuco suggest that although displacement to the latter two regions can occur, the overall pattern is that net migration occurs in the opposite direction, i.e. to San Martin and Ucayali (Tables 10.1.1 and 10.1.2), presumably due to greater economic opportunity in the latter two regions. This suggests that while displacement from the accounting area to Loreto and Huanuco may occur, it may be on a limited scale. Table 10.1.1 also suggest that Madre de Dios, as a recipient of net immigration may be a target for displacement, but the recent implementation of strengthened sanctions on informal activities there suggests that this region's attractiveness for migrants from other regions may be reduced. Lima is the most frequent destination for migrants from San Martin and Ucayali, but the risk for deforestation there is null.

Table 10.1.1. Immigration and emigration (1000s of migrants) in regions of the Peruvian Amazon (INEI and OIM, 2017)⁸⁸

Region	Immigration	Emigration	Net
Amazonas	87	127	-40
Loreto	78	183	-105
Madre de Dios	57	11	46
San Martin	242	173	69
Ucayali	148	72	66
Huanuco	80	324	-244

Table 10.1.2. Emigration (1000s of migrants) from San Martin and Ucayali to other Amazon regions (INEI and OIM, 2017)

Region	Emigration to Loreto, Amazonas, Madre de Dios (% of total)	Emigration to San Martin or Ucayali	Emigration to Andean-Amazon transition zones (Huánuco, Pasco, Cajamarca)
San Martin	47.5 (19.6%)	18.7 (7.7%)	15.1 (11.8 to Huánuco)
Ucayali	16.0 (21.9%)	2.5 (3.4%)	10.0 (9.2 to Huánuco)

⁸⁸ INEI and OIM 2017. Migraciones internas en el Perú a nivel departamental. OIM, Lima. <http://www.oimperu.org/>

In conclusion, displacement from San Martin and Ucayali to other forested areas in the Amazon is likely to be low and will probably be most associated with unfavorable climatic conditions for coffee. This displacement is unlikely to impact the regions found wholly in the Amazon (Loreto, Amazonas, Madre de Dios), but may affect forest in the Amazon-Andean transition zone found in Huanuco. In the latter case, it should be noted that historical emigration from Huanuco to San Martin or Ucayali is much greater than migrant flows in the opposite direction.

In general, the Program has tried to reduce the possibility of displacement by focusing on improving productive conditions and increasing economic opportunities that would reduce the need for displacement from the accounting area, should disruptions occur as the result of Program interventions.

An analysis of the risk of displacement in relation to the drivers of deforestation and Program interventions is presented below.

Table 10.1.3. Summary of the drivers of deforestation and the risk of displacement.

Driver of deforestation	Risk of Displacement . (Categorize as High, Medium or Low)	Explanation / justification of risk assessment
Low value of forests and illegal logging	Medium	<p>The low commercial value of forests and forest land is due to the undervaluation of goods and services produced by forests. This does not allow forest production to compete with other alternative land uses. Illegal logging is a direct result of this situation, which exacerbates the loss of commercially valuable tree species and damage to the surrounding area.</p> <p>Increasing the value of forests may force poor, migrant farmers to look for cheaper land elsewhere. The risk of displacement is medium, since the program's economic and productive interventions are aimed at increasing the value of forests via the assignment of rights, strengthened forest governance, conservation, and more productive activities. Greater income derived from forests should result in a reduction of displacement.</p> <p>On the other hand, some actors may be displaced by these activities. However, their migration to other forested areas outside the accounting area are apt to be limited, since available land with similar characteristics (i.e. mostly lowland jungle and accessible mountain regions) are only available in Southern Loreto, small northern regions of Cusco, eastern Huanuco, and western Madre de Dios. Any high-altitude forests in the Amazon to Andes transition zone (i.e. above 2500 masl) is much less available, since the nighttime low temperatures and increase UV radiation is not favorable for most commercial tropical crops. Furthermore, these zones have historically expelled migrants; Madre de Dios may also be unattractive due to strengthened sanctions on illegal activities.</p>
Small-scale commercial agriculture (principally coffee, cocoa, and oil palm)	Medium	As mentioned in Section 4, small-scale commercial agriculture is a main driver of deforestation in San Martin and Ucayali. This driver has been associated with the expansion of the agricultural frontier in this region, particularly in the lowland jungle and accessible mountainous regions.

		<p>Large scale oil palm agricultural expansion began in 2010, particularly in the lowland jungles of San Martin and Ucayali, where industrial agricultural projects converted both primary forest and degraded lands into oil palm plantations. However, there has since been a substantial slowdown in large scale forest conversion to oil palm plantations⁸⁹, beginning with RSPO certification and other net zero deforestation initiatives in 2016-2017.</p> <p>Any high-altitude forests in the Amazon to Andes transition zone (i.e. above 2500 masl) is much less available, since the nighttime low temperatures and increase in UV radiation is not favorable for coffee and cocoa. Also, oil palm is only planted in lowland jungle areas due to drainage and topography issues.</p> <p>The program’s interventions are aimed to assign rights to small landholders and promote increased productivity in non-forest or previously deforested land. They will also create off-farm employment through investment opportunities in green business. These measures should reduce displacement. Farmers who are excluded from these interventions are likely to continue business-as-usual practices rather than migrate to other Amazon regions.</p>
Subsistence agriculture /migrants	Medium-Low	<p>As with many parts of the Peruvian Amazon, subsistence agriculture, which may involve migrants from the Andean region or other departments of the Amazon, continue to have an impact. There are many nuanced underlying causes, which include policy incentives, shifting market conditions, changes to infrastructure, and the availability of investment capital that result in out-migration to the Amazon. Nonetheless, this driver is considered medium-low, since subsistence agriculture has much less of an environmental impact, as it is less likely to expand to new frontiers and subsistence needs are often met on long established landholdings⁹⁰.</p> <p>The program’s interventions will focus on the introduction and management of more valuable commercial crops and promote reforestation among subsistence farmers, and off-farm employment creation in order to reduce pressure on forests and/or displacement to other areas. These measures should reduce displacement of participating farmers. Farmers who are excluded from these interventions are likely to continue business-as-usual practices rather than migrate to other Amazon regions.</p>
Land speculation facilitated by roads	Medium	<p>Land speculation is a significant direct driver of deforestation and is linked to agriculture and the access to roads. Acquisition of lands with no assigned rights are often a target for agricultural expansion and requires access.</p> <p>This driver may cause displacement to areas being opened up by roads, but outside of the accounting area Madre de Dios, Loreto, and Amazonas are relatively unattractive areas due to increased sanctions on illegal gold mining in Madre de Dios and the general lack of economic opportunities in Loreto and Amazonas, both of which tend to expulse migrants to San Martin and Ucayali.</p>

⁸⁹ Finer M, Vijay V, Mamani N (2018) Oil Palm Baseline for the Peruvian Amazon. MAAP: 95.

⁹⁰ Ravikumar A, Sears, RR, Cronkleton, P, Menton, M, Pérez-Ojeda del Arco, M (2016) Is small-scale agriculture really the main driver of deforestation in the Peruvian Amazon? Moving beyond the prevailing narrative. Conservation Letters 10: 170-177.

		The program's interventions in land classification, zoning, and titling as well as monitoring and control will help facilitate land zoning initiatives and enforce land rights at the regional level, which should reduce displacement within the accounting area.
Limited inter-sectorial or vertical coordination	Low	<p>Limited inter-sectorial and vertical coordination is considered an indirect driver of deforestation. Illegal loggers, land speculators, and others take advantage of the lack of coordination and the lack of the presence of authorities to expand their activities.</p> <p>In recent years, a number of initiatives from the National Forest Conservation Program (PNCB to the Joint Declaration of Intent (DCI) between Norway, Germany and Peru (i.e. international agreements to reduce deforestation) have focused on coordinating multiple vertical and horizontal actors. These include the Ministry of the Environment, Ministry of Agriculture and Irrigation, Regional Governments, and indigenous communities in the Peruvian Amazon. The Program's interventions are also designed to further enable institutional conditions to align and coordinate between sectors and build on previous advances.</p> <p>Greater coordination may result in greater control of forest lands, which may result in displacement of some settlers. However, outside of the accounting area, the Amazon regional governments are starting to adopt a production-protection approach focused on increasing forest conservation and sustainable development. Together with the low attractiveness of other forested regions, these measures should reduce the potential of displacement to other forested areas outside the accounting area.</p>
Lack of coherence between policies or policy gaps	Low	<p>Lack of coherence between policies or policy gaps are considered indirect drivers, since certain actors may take advantage of inadequate policies to increase landholdings, selectively log commercial tree species, and convert forest to agricultural lands. In the past few years, Peru has worked on environmental laws to decrease deforestation⁹¹ and carbon emissions⁹², with the support of the international community (e.g. DCI between Norway, Germany and Peru).</p> <p>The program's interventions are designed to further enable institutional conditions to align and coordinate between sectors and build on previous advances. This may result in greater control of forest lands, which may result in displacement of some settlers. However, outside of the accounting area, the Amazon regional governments are starting to adopt a production-protection approach focused on increasing forest conservation and sustainable development. Together with the low attractiveness of other forested regions, these measures should reduce the potential of displacement to other forested areas outside the accounting area.</p>
Lands with unassigned rights	Medium	Land with unassigned rights are considered an indirect driver of deforestation, since agricultural and illegal logging expansion tends to occur most in these areas. Indeed, the MMCB reports that the highest rate of deforestation at the regional and biome levels occur here. There are several initiatives with the support of the international community (e.g. DCI between Norway, Germany and Peru) to assign land rights and improve land and forest zoning.

⁹¹ Legislative Decree N° 1220 (Legislative Decree that establishes measures to fight against illegal logging).

⁹² Supreme Degree N° 011-2015-MINAM (National Climate Change Strategy).

		The program's interventions are designed to support zoning, classification, and titling. The risk of displacement is considering medium, since these activities may force expansion of agricultural and logging activities onto remaining lands with unassigned rights which are associated with increased deforestation.
Monitoring, control, and enforcement of land and natural resource use	Low	Increased monitoring, control, and enforcement of forest and resource use may provoke displacement among certain social sectors. On the other hand, the promotion of improved agricultural technologies, improved credit availability, technical assistance, conservation payments, and investments that create off-farm employment may result in greater economic opportunities. This may offset the increased risk of displacement caused by tighter control. Therefore, this risk is considered to be low-medium.
Limited information collection, use, and dissemination	Low	<p>Contradictory policies or policy gaps are considered indirect drivers, since certain actors may take advantage of inadequate policies to increase landholdings, selectively log commercial tree species, and convert forest to agricultural lands. In the past few years, Peru has worked on environmental laws to decrease deforestation⁹³ and carbon emissions⁹⁴, with the support of the international community (e.g. DCI between Norway, Germany and Peru).</p> <p>The program's interventions are designed to further enable institutional conditions to align and coordinate between sectors and build on previous advances. This may result in greater control of forest lands, which may result in displacement of some settlers. However, outside of the accounting area, the Amazon regional governments are starting to adopt a production-protection approach focused on increasing forest conservation and sustainable development. Together with the low attractiveness of other forested regions, these measures should reduce the potential of displacement to other forested areas outside the accounting area.</p>
Limited institutional resources and capacities	Low-Medium	<p>Institutional resources and capacities in the accounting area are limited, but have improved via a variety of initiatives to support institutions involved with the reduction in carbon emissions.</p> <p>The Program's interventions will further institutional capacity for San Martin and Ucayali and should result in greater land use control as well as the promotion of economic activities. These results are likely to offset one another. Therefore, this risk is considered to be low to medium.</p>

10.2 ER Program design features to prevent and minimize potential Displacement

Generally, the risk of displacement from the accounting areas of San Martin and Ucayali may occur as a consequence of:

- i. The reduction of levels of production, income, or means of subsistence of the participating actors, either from natural or anthropogenic factors;
- ii. The rejection of the proposed mitigation measures, difficulties in adopting them on the part of the actors, or the lack of universal coverage of the Program activities;
- iii. Changes in land use regulations or control that can affect the above and subsequently cause migration to other areas.

⁹³ Legislative Decree N° 1220 (Legislative Decree that establishes measures to fight against illegal logging).

⁹⁴ Supreme Degree N° 011-2015-MINAM (National Climate Change Strategy).

The proposed interventions are aimed at reducing the principle direct causes of deforestation and forest degradation (i.e. low value of forests/illegal logging, small scale commercial agriculture, subsistence agriculture/migration, and land speculation facilitated by roads) and indirect causes that include limited coordination, lack of coherence of policies and policy gaps, land with unassigned rights, changes in monitoring control and enforcement, limited information, and limited institutional resources and capacity. The program's interventions that involve positive incentives are designed to decrease the risk of displacement. However, increasing the amounts of lands with assigned rights, increase in control measures, and changes in access to forest lands may displace some farmers and other actors, who are not able to participate in the economic and social benefits associated with more sustainable production systems. Interventions promoted by the ER Program, such as additional off-farm employment opportunities and agricultural projects in non-forest and previously deforested lands, may reduce the risk of displacement in these cases. In addition, other initiatives and programs (e.g. National Forest Conservation Program, the Forest Investment Program, and the Joint Declaration of Intent, among others) that address direct and indirect drivers are in place in different parts of the Peruvian Amazon. The other Amazon regional governments are also in the process of adopting a production-protection approach for sustainable, low emissions economic development in concert with forest conservation.

Of particular importance in understanding the interventions and associated interventions of the ER Program is their cross-sectorial characteristics to mitigate and minimize potential displacement. The direct drivers of deforestation, such as the low value of forests and illegal logging, require the collaboration of various sectors including public and private actors, conservation agencies (e.g. national parks, private reserves, etc.), and institutions that regulate legal timber extraction, to name a few. Therefore, many of these interventions require the improvement of enabling conditions by government institutions, and their capacity to regulate and enforce existing policies. The lack of institutional capacity and systemic problems has always limited the success of deforestation reduction programs in many developing countries. However now with several years of experience, it is increasingly evident to Peruvian government actors where interventions are most needed, including which specific components of ministries, regional governments or associated groups require the most assistance or have underperformed in past deforestation reduction efforts.

Additional important cross-sectorial interventions include the linking of economic incentives and development with forest conservation. From promoting results-based community conservation to creating off-farm employment opportunities, the interventions are designed to increase low-emissions economic activity within and outside the forests in order to increase their value or reduce the pressure for their conversion. For several years, MINAM has successfully executed the strategy of payments for conservation to indigenous communities (TDC's) with a goal to conserve more than 4 million hectares of Peruvian Amazon forest. The TDC's have a strong conservation component, but allow agricultural development as a planned activity, with the goal to increase productivity in current agricultural land. Other economic development interventions linking productive activities and forest conservations include MFC and MFS, agroforestry conditioned on on-farm forest conservation, and the promotion of investments in sustainable, low emissions business.

Most notably, land with unassigned rights and gaps in zoning have provided the basis for several deforestation drivers to flourish within the Peruvian Amazon. Forests with unassigned rights have the highest rate of deforestation and are the first to be exploited for selective logging, agricultural expansion, and land speculation. Indeed, if the interventions in the accounting area are successful, these areas in

neighboring regions may suffer the effects of displacement in the long term. However, the government of Peru has recognized these areas as vulnerable to deforestation and has systematically begun to assign right and titles through government programs and international initiatives (e.g. DCI).

The following are contextual/passive measures to reduce displacement:

- Other Amazon regions are in the process of establishing development policies that incorporate a forest protection-sustainable production approach, as part of the EII project.
- Implementation of measures to reduce deforestation in other regions as part of the NDCs, DCI, and other projects.
- Crackdown on illegal gold mining in Madre de Dios will reduce its attractiveness as an outlet for migrants.
- Increased national emphasis on sustainable development in the Amazon.
- Increased monitoring and public dissemination of information on deforestation.

The following Program interventions are also considered to reduce displacement:

- Increased investment and creation of off-farm employment by low emissions agricultural and forestry businesses (absorbs potential migrants)
- Increased monitoring, control, and enforcement of land use by regional governments is a disincentive to displacement
- Increased local monitoring and response to invasions by indigenous communities also acts as a disincentive
- Increased agricultural or forestry income reduces need to migrate
- Economic growth of regional cities creates jobs that can absorb migrants.

Table 10.2.1. Specific Program activities aimed at mitigating the risk of displacement.

Drivers of deforestation	Activities
Low value of forests and illegal logging	<p>The ER Program activities are aimed at increasing the value of forest lands through community forest management, sustainable forest management, the promotion of investments in forested zones, direct incentives for avoided deforestation, and employment creation. The creation of higher value from forests will reduce the need for displacement.</p> <p>The following activities will specifically mitigate displacement from local and indigenous communities:</p> <ul style="list-style-type: none"> Classify, clarify, and assign rights to forests under the figure of local forests. Zoning and titling of indigenous communities. Payments for conservation (TDCs) of forests on indigenous lands. Formulate community development plans financed by TDCs. Strengthen forest governance and technical, commercial, and monitoring capacities of indigenous and local communities. <p>Monitoring and response activities that will help control and use and provide disincentives for displacement include:</p> <ul style="list-style-type: none"> Facilitate the protection of National Protected Areas (ANPs) Strengthen technical units of the regional governments for MFC (UTMFC). Greater control of invasions of concessions in San Martin; In Ucayali, formulate the concession protocol for BPP (permanent production forests).

	<p>Partnership related activities that will reduce displacement include:</p> <p>Facilitation of commercial partnerships with loggers or buyers of non-timber forest products. Promotion of forestry clusters based on partnerships between the private sector and communities, mainly in Atalaya, Ucayali (approx. 180,000 ha+ community lands). Establishment and strengthening of producer associations.</p>
Small-scale commercial agriculture	<p>Intensified, more productive commercial agriculture will produce greater incomes and reduce the need for out-migration.</p> <p>The activities required to address the deforestation driver of small-scale commercial agriculture involve economic incentives, technology to increase production and incomes, and increased access to credit, information, and markets. The overall goal is to improve the productivity and commercial value of this type of agriculture, in order to stabilize land use and avoid the necessity to continually expand to neighboring areas. These activities include:</p> <p>Establish the economic identity of producers to increase their access to credit and reduce risk for lenders.</p> <p>Reduce interest rates of credit via new financial business models that reduce transaction costs and minimize the risk of loan losses.</p> <p>Use local or regional competitions to stimulate adoption of measures that increase productivity and quality and, ultimately, income.</p> <p>Promote technical assistance for sustainable agricultural production as well as for producer associations based on training and the sharing of experiences of these organizations.</p> <p>Increase linkages to de-commoditized niche markets based on sustainability and quality. Also, promote the adoption of branding criteria, and the establishment of platforms for market intelligence and a virtual marketplace.</p> <p>Use blockchain technology to reduce information-related asymmetries and transaction costs of value chains and increase product traceability.</p>
Subsistence agriculture/migrants	<p>The activities of the Program are aimed to increase the productivity and income of subsistence and migrant agriculture, as well as to increase off-farm employment opportunities for marginal farmers and migrants. Together, these activities will reduce the need for out-migration.</p> <p>Relevant activities include the following:</p> <p>Assignment of rights to riverine forests.</p> <p>Transitioning subsistence farmers to more sustainable commercial crops via technical assistance, access to credit, organizational strengthening, and improved linkages with markets.</p> <p>Creation of opportunities for sustainable management of riverine or local forests.</p> <p>Promotion of investments and off-farm employment</p> <p>Improved forest monitoring and control.</p> <p>Strengthen the investment promotion capacities of the regional governments (e.g. OPIPs), the private sector (e.g. ProUcayali, ProSanMartin), and public-private platforms (e.g. the Public-Private Coalition and rural development agencies - ARDs) in order to create off-farm employment.</p> <p>Promote forest-based businesses, such as ecotourism.</p>
Land speculation facilitated by roads	<p>There is a national effort to support land zoning and titling in the Amazon, clarify the rights to local and riverine forests, support the monitoring and control of deforestation activity (i.e. use of GeoBosques), improve coordination among sectors, inculcate strategies at the regional level that will reduce deforestation. These actions may indirectly reduce displacement associated with land speculation.</p>
Limited inter-sectorial or vertical coordination	<p>AT this time a number of high-level efforts are dedicated to improving governmental coordination, including the MIC and the Commission for Forest and Climate Change Governance. Better coordination of inter-governmental and sectorial policies and actions will affect the Amazon as a whole and will act to reduce displacement by reducing the opportunities for unauthorized use of land and forest.</p>

	<p>The ER program will follow the recommendations of the multi-level and multi-sector Committee for Sustainable Development of the Amazon. Also, establish or strengthen the following: the Amazon Commonwealth, which would replace CIAM (Amazon Interregional Council), a science and technology development platform, led by IIAP (Peruvian Amazon Research Institute), regional (public-private) development agencies (or ARD), the Public-Private Coalition.</p>
Coherence policies or policy gaps	<p>Better national and regional policies being promoted by the ER Program and other projects within and outside the accounting area (e.g. the protection-production approach being developed by the EII and the FIP project) will reduce displacement by reducing the opportunities for unauthorized use of land and forest and increasing employment and income generation that will result in more stable land use.</p> <p>Activities include: aligning regional government incentives (e.g. public services, infrastructure), regional branding, and the public-private investment strategy with low emission development. This also includes support to avoid authorizations of changes of use of forests (e.g. monitoring, articulation of zoning and titling, etc.) and reduce the regional governments' provision of public services to agricultural settlements located in areas classified for forest use.</p>
Lands with unassigned rights	<p>Within the accounting area, assigning rights to land will formalize land holding and increase their value, both of which will stabilize land use and thus reduce displacement. Assignment of land rights outside the accounting area, via on-going land titling programs and projects, will also incentivize rights holders to protect their interests, thus reducing available "spaces" for displacement.</p> <p>Generally, the program seeks to clarify or assign rights to forests with unassigned rights, local and riverine forests, and titling of indigenous communities.</p> <p>In forestry concessions in San Martin, the focus will be in zoning and reclassifying forest concession affected by illegal settlements. In Ucayali, the program will formulate the concession protocol for PPF (permanent forest production), and help re-assign rights to abandoned or expired forestry concessions. In addition, the program seeks to grant cession of use contracts for agroforestry in both regions.</p>
Monitoring, control, and enforcement of land and natural resource use	<p>Better monitoring, control, and enforcement of land and natural resource use will have little impact or may even increase displacement unless other regions implement similar improvements.</p> <p>MINAM, SERFOR, and a variety of projects are working outside of the accounting area to increase forest monitoring and control, and the development of improved and sustainable economic opportunities that will reduce the risk of displacement.</p> <p>The Program's contributions to these efforts will include piloting of forestry supervision and deforestation response by <i>veedurías forestales</i> and forest custodianship of indigenous lands and better information use by SERFOR. The ER Program will also continue to disseminate the use of the GeoBosques monitoring system and the early warning system among governmental and non-governmental users. The system includes a community monitoring system that includes images and data from cell phone apps and drone over flights conducted by the communities in the TDC initiative. The ER Program will provide a road map to monitor cession of use contracts and regional branding of beneficiaries, both of which include deforestation reduction as a criterion.</p>
Limited information collection, use, and dissemination	<p>Better information, its dissemination and use is necessary for monitoring, planning, and formulating strategies and interventions, which, taken together ,can indirectly help reduce displacement by better responding to stakeholder needs, increase public consciousness of deforestation and its effects, and by redirecting government efforts to critical social and economic factors that underlie displacement.</p>

	<p>The Program’s interventions in this area will have a global impact, outside that of just the accounting area. The ER Program has specific lines of action to increase the overall collection, use, and dissemination of information in the forest sector. First, the program will provide a roadmap to consolidate information in SINIA and SNIFFS. Currently, these information hubs are found in separate ministries, namely MINAM and MINAGRI, despite containing similar or complementary information. Without a doubt, it will be increasingly important for decision makers to be able to access this array of information.</p> <p>Next, the program will assist in improving and officializing forestry information, which is currently spotty at best. This will also include a standardization of methodology for information collection. The program will also centralize information related to early warning and forestry inspections in the accounting area. San Martin has among the most advanced networking of information and can serve as an example for Ucayali and other regional governments.</p> <p>The Program will also assist in linking information from forest plan, permits, inspections, and checkpoints.</p> <p>The program will also promote public environmental education related to deforestation and low emissions productive activities. Finally, information and results of these activities will be accessible via the internet to reduce asymmetries of commercial information.</p>
<p>Limited institutional resources and capacities</p>	<p>Greater institutional resources and capacities will potentiate an improved enabling environment that is better adapted to responding to pressure on forests as well as increasing private investment in sustainable low emission activities. Together, both will stabilize land use and thus decrease the possibility of displacement.</p> <p>To this end, the ER Program will continue to train institutional personnel on new strategies, incorporate technologies, and increase capacity for their use. In order to increase resources, a goal of the program is to seek partnerships, particularly from the private sector, to form additional projects with a common vision to reduce deforestation, and to use PIPs in order to increase regional government activities and budgets.</p>

11. REVERSALS

11.1 Identification of risk of Reversals

Reversals are the result of changes in the conditions that allowed or supported previously achieved emissions reductions. These changes can be natural or anthropogenic in origin and can commence from inside or outside the accounting area.

Natural changes are a frequent occurrence in the Peruvian Amazon and may be both cyclical and non-cyclical events that have a local to regional impact. Of these, the reoccurring El Niño phenomenon, characterized by warming water conditions in the equatorial Pacific and significant drought conditions in the Eastern Amazon, have had widespread impact. Specifically, strong El Niño events in 2005, 2010 and 2016 caused moderate to severe drought conditions in many parts of San Martin and Ucayali⁹⁵. This resulted in multiple effects on the forest ecosystem including a significant dieback of understory vegetation, drying of shallow wetlands, weakening or dying of mature stands of trees, and increased number and extent of forest fires. Indeed, the National Forest Monitoring System (MMCB) recorded an

⁹⁵ Saatchi, S, Asefi-Najafabady, S, Malhi, Y, Aragão, LEOC, Anderson, LO, Myneni, RB, Nemani, R. (2013) Persistent effects of a severe drought on Amazonian forest canopy. PNAS 110: 565-570.

unusually high level of deforestation in 2005, and elevated levels of deforestation in 2010 and 2016. A weak to moderate El Niño event is forecast for 2019⁹⁶.

Additional natural events that may cause deforestation include flooding from river meandering, hurricane force winds, fires (ignited by lightning) and landslides. The MNCB excludes forest loss from river meandering in the current annual report and they are working on excluding forest loss from hurricane force winds and landslides in future reports. Generally, due to their origin, these changes have a medium level of predictability, may be local and regional in importance, and are difficult to avoid and control. Post-event responses can be important for reducing their impact, but this depends on the location of the effect.

Anthropogenic change events may have an origin internal or external to the accounting area. Internal changes may be directly or indirectly related to the presence or absence of program activities. External agents often reflect broad socioeconomic forces that are difficult to predict, avoid, or mitigate in the short term. These forces can include changes in international markets and demand for agricultural or forestry goods or services. These conditions are difficult to control at the national level, since they reflect large-scale consumer patterns or changes in technology. Domestically, change in demographics, migration patterns, and poverty levels are also difficult to control in the short- and medium terms. These may be products of underlying socioeconomic and environmental factors, structures, and conditions. In the long-term, the anthropogenic causes of reversals can be changed by laws, policies, institution-building, or changes in underlying economic structures or conditions.

The ER Program will prioritize causes of reversals that occur in the short- or medium-terms, and will also address the threat of reversals beyond the term of the ERPA. Short- and medium-term threats are affected by participation in and support of the Program, institutional capacities and coordination, and internal project organization and implementation. The Program will also address finances, regional and local policies and politics which are under greater, albeit partial, control by the Program.

Beyond the term of the ERPA, the Program will attempt to assure the long-term sustainability of the emissions reductions achieved by promoting further consolidation of land rights, and promote a new production-protection low emissions development model via changes in economic incentives, credit, new market linkages based on sustainability, and regional branding. In addition, the Program will increase the capacity of producers and institutions to continuously monitor and control land use.

As a jurisdiction, the accounting area is instituting measures (e.g. branding based on reduced deforestation, economic development strategies based on forest protection-sustainable production, land titling, improved monitoring and control of land use) that will act as disincentives to deforestation. In the specific context of the ER Program, the overall strategy of the Program is aimed at sustainable, low emissions development based on a series of inter-locking command-and-control measures for controlling land use and deforestation in combination with incentives and interventions that favor sustainable land use as well as those that reduce pressure on forest via employment creation.

⁹⁶ NOAA Climate Prediction Center.
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml

In order to evaluate the risk of these reversals (non-permanence), the Carbon Fund tool⁹⁷ for evaluating the risk of reversals has been used.

The risk factors analyzed include the following:

Risk Factor A: Lack of broad and sustained stakeholder support

Are stakeholders aware of, and/or have positive experience with FGRM, benefit sharing plans etc. or similar instruments in other contexts?

A large number of key stakeholders at multiple levels has been involved in the design and implementation of REDD+ and related activities, since its inception in Peru around 2013 (see Section 5). Most of the same actors have also participated in workshops and meetings regarding the development of the ER Program. These workshops, including recent regional consultation workshops in March 2019, also evidenced broad support for the ER Program as well as suggestions as to how the Program can be improved.

With regards to specific programmatic details, the MAC, safeguards systems, local monitoring, and benefit distribution plan are still at an early stage, but some stakeholders have had experience with similar instruments, as evidenced by the comments regarding MAC in the regional consultation workshops in March 2019. A road map has been developed for future consultations, which will be used to continue broadening and firming up stakeholder support by increasing stakeholder education and eliciting ideas related with these themes. Based on the regional consultation workshops in March 2019, stakeholders have had experience and made recommendations related to RGRM. Due to past participation in REDD+ activities and scheduled participation of stakeholders, the risk is considered to be medium.

Have occurrences of conflicts over land and resources been addressed?

Peru has long recognized the importance of assigning land rights to indigenous and local communities, particularly in areas where land rights have historically been lacking for all actors. As previously noted, these areas with unassigned rights experience the highest rate of deforestation across the Peruvian Amazon. Several current initiatives and programs, both domestic and international, address this issue, either directly or indirectly, by providing financial and logistic support for zoning and titling (e.g. STRT3 of IDB, the DCI, FIP, Ecological and Economic Zoning of Peru, among others). Involvement of indigenous communities in these projects and processes has helped reduce conflicts related to titling (see section 4.4). Nonetheless, the implementation of these activities is slow and quantifying positive results from zoning and land rights are for the mid- and long-terms. Even though the existence of legal instruments and frameworks for land ownership disputes will contribute to the permanence of the emission reduction during and beyond the term of the ERPA, the risk associated with this indicator is considered medium, due to deficiencies in the agile resolution of land rights and conflicts.

In summary, since the components of risk factor A are the same, the overall score for risk factor A is medium (Reversal Risk Set Aside: 5%).

⁹⁷ ER Program Buffer Guidelines. December 11, 2015. Section 6.

Risk Factor B: Lack of institutional capacities and/or ineffective vertical/cross sectorial coordination

Is there a track record of key institutions in implementing programs and policies?

Regarding REDD+ and related activities, Peru has a significant history of participation in REDD+ and has strived for the cooperation of key institutions in implementing national and international programs and policies. This often comprises of MINAM and MINAGRI, who are directly involved with decision making, use, and conservation of forest resources in the Peruvian Amazon. Each of these ministries contain affiliated government agencies that lead or coordinate REDD+ related activities and appear in key legislation and policies. Among the most active institutions are PNCB, SERNANP, IIAP, and SERFOR. Recently, high level, multi-sectorial and interlevel public-private commissions have been formed for Forest and Climate Change Governance and sustainable development of the Amazon with the objective of increasing vertical and cross-sectorial coordination.

Nevertheless, budget restrictions, which have secondary effects on staffing, equipment, infrastructure, and operations, are a major factor that could potentially limit the successful implementation of the ER Program. Peru is fortunate in having received substantial international support for MINAM and MINAGRI, and REDD+, and this support is expected to continue (indeed, a principal strategy of the ER Program is to harness the support on on-going or planned internationally funded projects). At the same time, MINAM has shown itself capable of responsibly managing funds from international cooperation (see section 2.3) and this experience is expected to provide a solid base for the coordination challenges presented by the ER Program. As a result, the risk factor is considered to be low to medium.

Is there experience of cross-sectorial cooperation?

As previously stated, several recent international programs and initiatives involve direct or indirect cross-sectorial cooperation, such as the Joint Declaration of Intent, FIP, R-PP, MINAM-CAF, SERFOR-CAF, UN-REDD, among others. Many of these began design and implementation as far back as 5 years ago with significant joint participation from PNCB (program from MINAM) and SERFOR (affiliate of MINAGRI). Most recently, high level, multi-sectorial and interlevel public-private commissions have been formed for Forest and Climate Change Governance and sustainable development of the Amazon with the objective of increasing vertical and cross-sectorial coordination.

As the ER Program is implemented, there will be a need to further improve the cooperation between sectors and build upon the success of current and previous endeavors. This cooperation is in the process of being formalized by the multi-sector and multi-level Committee for the Sustainable Development of the Peruvian Amazon (MIC), as well as a multi-sector committee for forest and climate change governance.

Perhaps the greatest threat from inadequate sectorial coordination may be from road construction projects that could occur in the accounting area during or beyond the term of the ERPA. There is currently no known scheduled road construction from the central or regional government at this time, although the regional governments will continue to improve existing roads. However, if priorities change, the environmental impacts of these roads will need to be avoided, reduced, or compensated. If not, parts of accounting area could run the risk of repeating the level of deforestation encountered along the interoceanic highway in the southern Amazon of Peru. As a result, the risk factor is considered to be medium.

Is there experience of collaboration between different levels of government?

In recent years, there has been a concerted effort to collaborate between the different levels of government. Representatives of many government institutions, from the central, regional and local levels, have been involved in direct and indirect REDD+ activities, from policy design to negotiations (e.g. DCI, FIP, etc.). Capacity building and outreach has been in the forefront of these interactions, in order for all representatives to be informed (see Section 5). Specifically for the ERP, there have been several meetings over the years between representatives of MINAM and the regional governments of San Martín and Ucayali, regarding the design and interventions proposed for the reduction of deforestation. As mentioned above, efforts are currently underway by the Multi-sector and Inter-level Committee for the Sustainable Development of the Peruvian Amazon, as well as a multi-sector committee for forests and climate change governances to increase collaboration among different levels of government.

Perhaps the greatest challenge from inadequate collaboration between the different levels of government involves the recent elections for all regions at the gubernatorial and mayoral level, this past year. The installment of new government officials and supporting personnel, scheduled for the 1st of January 2019, often requires at least a few months for personnel to be informed of all of the previous administration's activities, decisions, and agreements. There are no reelections allowed and often the new administration replaces at least a portion of the technical personnel. Nonetheless, the central government's ministries, institutions, and NGOs have actively engaged the new administrations to establish collaboration as quickly as possible, and the San Martín and Ucayali governments are on board with the proposed ER Program, as evidenced by the recent regional consultation workshops in March 2019. Therefore, the risk factor is considered to be low to medium.

In summary, the overall score for risk factor B is low to medium (Reversal Risk Set Aside: 3%), since there is a recent history of inter-institutional involvement and coordination between different levels of government regarding general policy and specifically REDD+ activities.

Risk Factor C: Lack of long-term effectiveness in addressing underlying drivers

Is there experience in decoupling deforestation and degradation from economic activities?

The downward trend in deforestation and degradation in San Martín, in the last 8 years after a peak in 2009, indicate a significant decoupling of deforestation and economic growth (see section 4.1 on elasticities of deforestation and economic growth). Its current rate of deforestation is closer to levels of the year 2001 than any other department in the Peruvian Amazon. This trend reflects a diversification and increase in production in previously deforested areas that are now focused on agricultural production, and include increased private investment, and economic activities that require less deforestation. San Martín is among the most organized of the Amazonian departments in regards to establishing land tenure and titles, increase in basic infrastructure and investments.

Conceptually, San Martín serves as a model for Ucayali in decoupling deforestation from its economic growth. The deforestation in Ucayali seems to have stabilized in 2015 to 2017, compared to previous years. If the ER Program's interventions are successful, then there should be a steady decline in deforestation comparable to San Martín. Since recent activity has decreased significantly in San Martín and has held steady in Ucayali, the risk factor is considered to be low to medium.

Is relevant legal and regulatory environment conducive to REDD+ objectives?

In the past few years, Peru has developed several environmental laws and regulations that address deforestation, authorization of land use change, zoning and titling. This series of legislations include the Legislative Decree that Establishes Measures to Fight against Illegal Logging⁹⁸, the Regulation of Forest Plantations and Agroforestry System Management⁹⁹, and the Proposal for the National Forest and Climate Change Strategy (including the National REDD+ Strategy)¹⁰⁰. The development of the laws and regulations are a direct response to the realization that the legal gaps in zoning and titling were direct causes of deforestation, particularly in the last 10 years. However, inconsistent and weak application of the legal framework and lack of law enforcement with regards to deforestation and land use change, in regions of the Peruvian Amazon, have proved to be consistent causes of forest loss, and are the target of Program interventions. Additionally, some aspects of legal rights to forest carbon and emission reductions are still not entirely clear, nor is the legal process for transferring rights to emissions reductions (see section 17); more agile procedures for responding to land use conflicts are also needed (see section 4.4) Therefore, although the Program will strive to increase the control and enforcement of land and resource use, this risk factor is considered to be medium.

In summary, the overall score for risk factor C is medium (Reversal Risk Set Aside: 3%), since there is evident decoupling of deforestation and economic activity in San Martin. However similar results are to be awaited in Ucayali during the ER Program. Also, although the legal and regulatory environment to reduce deforestation has developed in the past few years, more consistent and better enforcement is needed and some legal gaps need to be filled.

Risk Factor D: Exposure and vulnerability to natural disturbances

The accounting area is at medium risk (Reversal Risk Set Aside: 3%) due to natural disasters, such as floods, landslides, and El Niño caused droughts. Although, there is no established frequency for many of these events, they often have profound local impact. These impacts are difficult to predict and prevent, but good planning is essential at reducing their impact when they occur. Continuous monitoring, through the early warning system and with the resources of the MMCB, is an essential first step to measure the extent and impact of these events.

Table 11.1.1 Summary of the assessment of risk factors and the resulting set-aside percentage.

Risk Factors	Resulting Reversal Risk Set-Aside Percentage
Default risk	10%
Lack of broad and sustained stakeholder support	Medium: 5%
Lack of institutional capacities and/or ineffective vertical/cross sectorial coordination	Low to medium: 3%
Lack of long-term effectiveness in addressing underlying drivers	Medium: 3%

⁹⁸ Legislative Decree N° 1220 (2015).

⁹⁹ Supreme Decree N° 020-2015-MINAGRI (2015).

¹⁰⁰ Supreme Resolution N° 193-2015-PCM (2015).

Exposure and vulnerability to natural disturbances	Medium: 3%
Actual Reversal Risk Set-Aside Percentage:	Total = 24%

11.2 ER Program design features to prevent and mitigate Reversals

Natural and external anthropogenic risks are mostly beyond the scope of the Program’s avoidance and mitigation capabilities. As previously stated, naturally occurring drought, floods, and landslides can have major local impact but they are difficult to predict. However, the Program may contribute to monitoring and contingency plans to help contain the extent of such events. Any external changes, which may develop from changes in markets, policies or laws, usually occur over time and will allow the Program to adapt its interventions and activities.

Therefore, it is intent of the Program to focus on preventing and mitigating risk for reversals within the accounting area. As stated in Sections 4 and 10, mitigation of direct drivers of deforestation requires multi-sectorial interventions, where activities address different themes, from governance to market access to zoning and land titling issues. No one specific intervention is enough to mitigate any one specific risk. Generally, the policy changes and coordination efforts at the national and regional levels suggest that the Program’s focus will be assured that during and beyond the term of the ERPA. The evolution of the economies of San Martin and Ucayali and their relationship to global markets also suggest that the economic interventions promoting accessible, profitable and environmentally sustainable forest/agricultural productions systems will continue their positive evolution, based on the adoption of a new model for low emissions development by the regional governments that combines forest conservation and sustainable production. In addition, the Program’s interventions to increase the capacity of local, regional and the central governments to plan, monitor, and respond to changes in land and forest resources are expected to have long-lasting impacts, since the Program has targeted the processes of access to information, the establishment of good working among levels of governments and sectors, communication with all key stakeholders, an effective safeguard system, continuous monitoring of forest activity and land use, and obtaining adequate funding that underlie these changes.

To reduce the risk beyond the term of the ERPA, the Program incorporates several measures to promote new economic growth, promote investment and new market linkages, significantly increase zoning and titling, promote rural and indigenous community involvement, and increase the capacity and knowledge of all key stakeholders involved.

In order to prevent reversals, the following mitigation strategies for the risk factor mentioned in Section 11.1 have been included in Program design.

Table 11.2.1 Summary of mitigation strategies for risk factors potentially affecting the ER Program.

Risk factors	Mitigation strategies
Lack of broad and sustained stakeholder support	The design, implementation and activities of the Program have been carried out with the participation of numerous stakeholders. Participation and consultation will continue during Program implementation and will make use of formal instruments (e.g. the Plan for the Involvement of Stakeholders, and the MAC). Communication on the progress of the Program and technical decision-making will be

Risk factors	Mitigation strategies
	<p>maintained and improved.</p> <p>Rural and indigenous communities will continue to be active participants in Program activities and will be consulted; participation in Indigenous MRV (iMRV) and other related activities will be continued.</p> <p>Promotion of regional branding, based on reduced deforestation and improved socioeconomic criteria will help garner support from stakeholders.</p>
<p>Lack of institutional capacities and/or ineffective vertical/cross sectorial coordination</p>	<p>Building on past success of vertical and cross sectorial coordination, the ER Program is focused on promoting low emissions economic development in the two regions, improving coordination among key institutions, renewing coordination among government and non-government entities after the recent elections, and informing old and new stakeholders of the ambition and implementation plans of the interventions.</p> <p>The Program's strategy is designed to further increase the capacity of the central government, and increase the technical training of regional and local institutional personnel, as well as the financial resources of governments.</p> <p>Financially, the Program will focus on attracting new private sector investments in low emissions agricultural and forestry activities, increase the accessibility of credit, the formation of public-private partnerships, and the use of PIPs and international donor programs to fill financial gaps.</p> <p>As mentioned in Section 10.2, in order to increase coordination, the ER program will incorporate the recommendations of the multi-level and multi-sectorial Committee for Sustainable Development of the Amazon and the Commission for Forest and Climate Change Governance. It also includes the establishment of the Amazon Commonwealth, which would replace CIAM (Amazon Interregional Council), a science and technology development platform led by IIAP (Peruvian Amazon Research Institute), and regional (public-private) development agencies (or ARD), and the Public-Private Coalition.</p>
<p>Lack of long-term effectiveness in addressing underlying drivers</p>	<p>The Program will coordinate with the MNCB (National Forest Monitoring System) and the PNCB to receive newly developed land use/land use change data derived from satellite imagery. Along with annual deforestation data and density analysis, this information helps to track general drivers of deforestation in deforestation hotspots.</p> <p>Interventions are designed to contribute to more sustainable economic model based on increases in the value of the natural forest and more productive and sustainable agricultural use. This includes the promotion of green investments and sustainable agroforestry/agricultural production systems. The creation of off-farm employment opportunities through investments and the promotion of public and private sector partnerships, will also lessen the pressure on forests.</p> <p>The Program will facilitate the increase of regional and local institutional capacities to monitor and control land and forest use will help reduce deforestation in the medium- and long-term. It will directly address the lack of zoning and titling in the accounting area, which once implemented, will significantly reduce the rate of deforestation in the medium- and long-term.</p>
<p>Exposure and vulnerability to natural disturbances</p>	<p>The Program will coordinate with the MNCB and receive continuous information from the Deforestation, National Reference Line and Early Warning system sub-modules.</p> <p>The Program will also coordinate with the regional governments of San Martin and Ucayali to receive information and advice on response strategies.</p>

11.3 Reversal management mechanism

Selection of Reversal management mechanism

Reversal management mechanism	Selected (Yes/No)
Option 1: The ER Program has in place a Reversal management mechanism that is substantially equivalent to the Reversal risk mitigation assurance provided by the ER Program CF Buffer approach	
Option 2: ERs from the ER Program are deposited in an ER Program -specific buffer, managed by the Carbon Fund (ER Program CF Buffer), and based on a Reversal risk assessment.	X

For option 1, explanation of Reversal management mechanism

Not applicable.

For option 2, explanation of Reversal management mechanism

In order to deal with unforeseen risks, 24% of the avoided emissions from deforestation and forest degradation will be used as buffer reserves, equivalent to 6,426,000 tCO₂e, assuming total emission reductions of 26,774,276.7 tCO₂e (see Section 13).

11.4 Monitoring and reporting of major emissions that could lead to Reversals of ERs

Monitoring of potential reversals will be carried out by the MNCB (National Forest Cover Monitoring System), which contains different interacting sub-modules that can register and report deforestation in the accounting area. The Deforestation, Degradation and the National Reference Line sub-modules report annual deforestation and carbon emissions from satellite data, release annual reports, and disseminates information periodically through GeoBosques. The Early Warning sub-module releases deforestation alerts, from satellite data, at least twice a month in GeoBosques, with wall-to-wall coverage over the Peruvian Amazon. The MNCB, PNCB, and SEFOR have the capability to monitor forest fires through satellite imagery. When reversals are detected, the Carbon Fund will be notified within the time limit described in the Methodological Framework.

12. UNCERTAINTIES OF THE CALCULATION OF EMISSION REDUCTIONS

12.1 Identification and assessment of sources of uncertainty

The methodology used to quantify emissions in the accounting area includes an analysis of uncertainty based on the guidelines of the IPCC (2006) and the FCPF Methodological Framework (2016). The Program quantified the uncertainty associated with the reference level, using the available data, and attempted to minimize uncertainty whenever possible, as stipulated in the Methodological Framework. A Monte Carlo simulation was used to quantify the uncertainty associated with the emissions reductions. The

quantified errors for the estimation of deforestation, forest degradation and emission factors, which were individually calculated with an unbiased accuracy assessment, were combined in estimates of uncertainty based on a 95% two-sided confidence interval within the Monte Carlo simulation. The combination of these sources of error generates the uncertainty associated with the emissions calculations reported.

A gap in information exists with regards to reporting the uncertainty for emissions factors. As stated in National Forest Reference Emission Level (FREL, 2016), only the variance of each ecozone (i.e. Selva Baja, Selva Alta Accesible, and Selva Alta de Difícil Acceso) and the uncertainty of the below-ground-biomass equation could be considered, as insufficient information was available to estimate the uncertainties associated with allometric equations used to estimate the above-ground biomass of the measured trees (See Table 9.1.2). Also, for the uncertainty of the historical emissions, accuracy assessment information of activity data (i.e. deforestation and forest degradation) per eco-zone were not available.

It should be noted that the emission factors used in the present document have also been used in the official National Forest Emission Level, the National Greenhouse Gas Inventory, and will be included in the next update of the Biennial Update Report. These emission factors have also been used for other international reporting, such as the Joint Declaration of Intent and the Forest Investment Program. Also worth noting is that the data from the National Forest Inventory will be the official estimates once they become available. Update and adjustments to each ecozone's carbon density and emission factors will proceed as data becomes available.

Activity Data: Deforestation

Activity data analysis for deforestation was derived from a customized forest cover loss algorithm for the Peruvian Amazon developed by Professor Matt Hansen, of the University of Maryland (see Section 8.3). The dataset first began with a Forest/Non-Forest benchmark map for the year 2000 and then registered annual forest cover loss at 30 m spatial resolution (i.e. Landsat 5, 7 and 8 images), with current data from 2001 to 2017. The benchmark map was developed first through spectral classification of Landsat imagery and then adjusted with feedback from regional experts. After an annual image is processed through a customized supervised classification algorithm for multiple spectral metrics, forest cover loss (i.e. deforestation) is identified. The post-processing review involves adjustments and corrections to the final map by a panel of national experts from MINAM and MINAGRI. This final step reduces the level of classification uncertainty and error due to their knowledge of forests in Peru. Annual forest cover loss from river meandering is excluded from the annual count. Annual deforestation for the accounting area of San Martín and Ucayali, are extracted from this dataset. The uncertainty analysis was performed for the accounting area only and independently of other types of possible activity data.

Potential sources of uncertainty may be related to the characteristics of the benchmark map for the year 2000. The map was validated through a team of local experts, regional workshops and expert judgment. There was no field validation conducted at the time of its development. Nonetheless, very high resolution satellite images have been used to assess forest and forest loss accuracy in subsequent years, including the data for the ERPD. All results show a high classification accuracy level. In addition, the classification of mature forest, during the benchmark year, may be confused with mature secondary forest, which may have been disturbed prior to the year 2000, and mature forest plantations, also planted before the benchmark year. Although there is little information on the past extent of these

classes, Peru considers their extent limited in the year 2000. There is also no current methodology to separate these classes from each other with Landsat or other satellites during the early 2000's.

Additional source of uncertainty may involve the final adjustments to the annual deforestation data, which involves the participation of technical experts in MINAM and MINAGRI. Through visual interpretation, the technical expert may disagree with the algorithm's assessment of the pixel as "deforested" and may advise to reverse the assessment. The team of experts of MINAM and MINAGRI make a decision on the changes before making them final. It is worth noting that a pixel designated as deforested, after the final review, is registered as a loss and no other activity (e.g. secondary forest growth, new forest plantation, etc.) is registered for that pixel into the future.

Activity Data: Forest Degradation

Activity data analysis for forest deforestation was based on the proxy-based approach presented in GOF-C-GOLD Sourcebook (2016), Section 2.2.2.2: "Indirect approach to monitor forest degradation" and adjusted using national data (see Section 8.3). The "forest remaining forest" (i.e. no deforestation) was divided into intact forest (i.e. fully-stocked forest) and non-intact forests (i.e. not fully stocked due to some level of timber exploitation or canopy degradation). The intact and non-intact forest data used the forest layer available from the year 2000 and the remaining forest cover after annual deforestation counts. The non-intact forest was further subdivided into six categories based on connectivity and isolation from the core forest. To avoid double accounting, the proxy was applied to the base year, the annual deforestation layer (i.e. the remaining forest layer), and deforested pixels in subsequent years were excluded. The proxy was conducted for the entire Peruvian Amazon biome and the accounting area was extracted from this data set.

As a proxy, there are multiple potential sources of uncertainty, since the approach is not based on field observations or "direct" measurement with high resolution satellite imagery. The proxy-based approach is a first estimation of forest degradation based on the distance from deforestation and non-forest areas. In other words, the method will include the errors associated with the forest/non-forest benchmark map and annual deforestation data. There are no final adjustments from expert opinion or visual validation using additional high-resolution satellite imagery. Since the approach involves a constant buffer distance from the forest edge, areas that may be theoretically characterized as part of an intact forest could be included in the annual forest degradation count. Despite these drawbacks, the proxy-based approach does serve as a consistent estimation of non-intact forest cover (i.e. forest degradation) since it uses the forest cover/annual loss dataset as its base. It also serves as a rapid estimation of the fraction of carbon dioxide emissions originating from forest degradation compared to deforestation.

It is worth noting that from 2020 onwards degradation emissions will be estimated and monitored with a direct methodology, currently under development. The main sources of uncertainty are being tackled as the methodology is developed. Uncertainty estimates will also be available of the historic period.

Emission Factors

Emission factors were based on the carbon density map of forest ecozones, established in 2014. As previously stated (see Section 8.3), the emission factors were estimated on forest inventory data obtained from a number of private institutions, governmental and non-governmental organizations, public and academic institutions. A strict quality control procedure was applied to exclude plots with

methodological issues (e.g. incompatible linear plots, plots outside forests, missing data, inconsistent protocols and data errors), since the data was developed from different sources. A final total of 1,152 plots in the Peruvian Amazon were included for the carbon density calculation.

At present, Peru has not developed allometric equations for tree biomass at the national or ecozone levels and, therefore, common allometric models were used. Various allometric equations for different forest and tree types (i.e. moist forest, wet forest, palms, and vines) were selected to estimate biomass for conditions similar to those of the accounting area. The allometric equations of Chave et al., 2005¹⁰¹, Pearson et al., 2005 and Putz, 1983 are among the most widely used in the scientific literature for tree or arboreal above-ground biomass estimation. Similarly, the estimation of below-ground biomass follows Mokany et al., 2006, which is also widely cited in biomass estimation.

Generally, errors in field measurements of tree characteristics are often associated with measurement errors (e.g. field measurement of tree diameter at breast height or DBH, or other sampling errors). In addition, there may be prediction errors of the allometric equations used to estimate biomass due to uncertainty related to model residuals and model parameters.

Unfortunately, no data was available to estimate the uncertainties associated with allometric equations used to estimate the above-ground biomass of the measured trees, since the data and analysis were conducted in 2014. Nonetheless, steps are being taken to update the carbon density and emission factors with data from the National Forest Inventory as they become available. There would be a change in methodology and carbon density values, but the NFI was designed specifically to better characterize Peruvian Amazon tree biomass through a sampling design.

Emission factors for forest degradation were estimated through a multistep process to allocate a fraction of the carbon density from the ecozone map to the forest fragmentation category. The range of carbon density values for each forest fragment category were extracted from the Peruvian Amazon carbon map of Asner et al., 2014. We then calculated the average carbon stock for each fragment category. Next, we determined its fraction compared to the average carbon density value per ecozone from the Peruvian Amazon carbon map. Finally, we apply this relativized fraction to the carbon stock value of each ecozone used previously for deforestation emissions.

Uncertainty for forest degradation emission factors are related to the carbon density map of forest ecozones, since they are from the same source of information. At this time, we do not have a specific measure of carbon density for degraded forest and they are not an independent class in the design of the National Forest Inventory. However, as the inventory data becomes available, there will be sites that are found in degraded forests and the data will be evaluated accordingly. The new methodology for degradation will be backed up with this information, for the validation of activity data and for the development of the emission factors. Peru considers all data associated with the forest degradation estimate to be a first-step estimation, which will be greatly improved with a current joint initiative from MINAM and UN-REDD.

¹⁰¹ When the above-ground biomass carbon stocks were estimated (second period of 2013), there was no information on national allometric equations for the six national ecozones, and the Chave et al. 2014 was neither available. In addition, the allometric equation from this later research includes total height, which is a parameter not always measured and that comes along with high uncertainty. To avoid this, the NFI is also using the Chave et al. 2005 equations. It is important to note that the author mentions that the 2014 equation does “not drastically change AGB stock estimates for moist tropical forests”, which is the case of the Selva Alta (Accesible and Difficil Acceso).

12.2 Quantification of uncertainty in Reference Level setting

In order to predict the total uncertainty of the reference level, two different sources of error were considered. These including the uncertainty of the activity data, the sampling error related to the estimation of the above-ground biomass and the uncertainty in the below-ground biomass allometric equation. For each activity data, individual accuracy assessments were performed following Olofsson et al. (2013) to perform unbiased area estimation and calculate the 95% confidence interval. The uncertainty of deforestation data, forest degradation data by proxy, and the emission factors, were calculated separately. The propagation of these sources of error was performed using Monte Carlo simulation in Excel following McMurray et al., 2017¹⁰².

To quantify the total emissions, it was important to first define the activity data conversion. Each pixel that was identified as deforestation was registered as a forest cover that transitioned to non-forest cover in a given year. The “new” non-forest pixel does not transition to another land cover type. In other words, it does not transition to another forest type, secondary forest or forest plantation in the future, due to the lack of data. The carbon that is emitted by the transition from forest to non-forest is considered total and instantaneous.

Each pixel that was identified as forest degradation, by proxy, was registered as “forest remaining forest” with a fractional loss of carbon density according to the forest fragmentation category assigned to it for a particular year. The pixel does not transition to another forest fragmentation category in the future. Also, if the pixel is registered as forest degradation, it does not transition to deforestation or other land cover type. If a forest degradation pixel is registered as a deforestation pixel in the future, it is removed from the forest degradation accounting when it first appeared. Also, forest pixels initially classified in a given non-intact forest category do not change their category in the future.

Removals were not considered in the ERPD due to the lack of data, at this time. MINAM and the MNCB are working on land cover change maps that will include information on secondary forests and will be available in the near future. The National Forest Inventory was not designed to include secondary forests or forest regeneration as a specific class. However, sample sites may have included secondary forests or regenerating forests and they will be assessed accordingly to contribute to the efforts for classifying secondary forest.

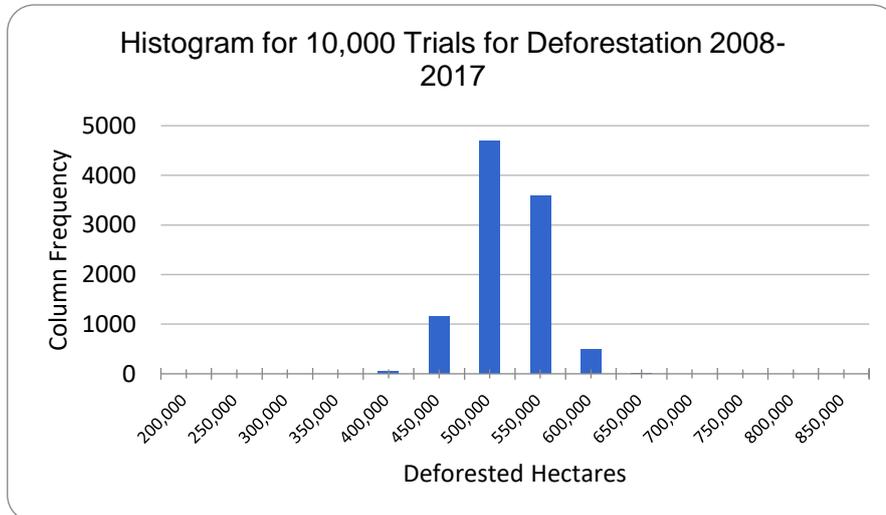
For deforestation activity data, the source of uncertainty is the error in the annual mapping of forest cover loss (i.e. deforestation). To estimate this error, we followed Olofsson et al. (2013) using a simple random stratified approach of the forest loss area, over the entire accounting area, from 2008 to 2017 (see Table 12.2.1). All other areas were designated either stable non-forest or stable forest. The Olofsson approach assumes a normal probability distribution and we ran 10,000 Monte Carlo simulations using Excel, following McMurray et al. (2017). Figure 12.2.1 shows the normal distributions of these simulations.

Table 12.2.1 Summary of unbiased area estimation and 95% confidence interval for total deforestation and forest degradation (by non-intact forest proxy) from 2008 to 2017.

¹⁰² McMurray, A, Pearson, T, Casarim, F. 2017. Guidance on Applying the Monte Carlo Approach to Uncertainty Analysis in Forestry and Greenhouse Gas Accounting. Winrock International.

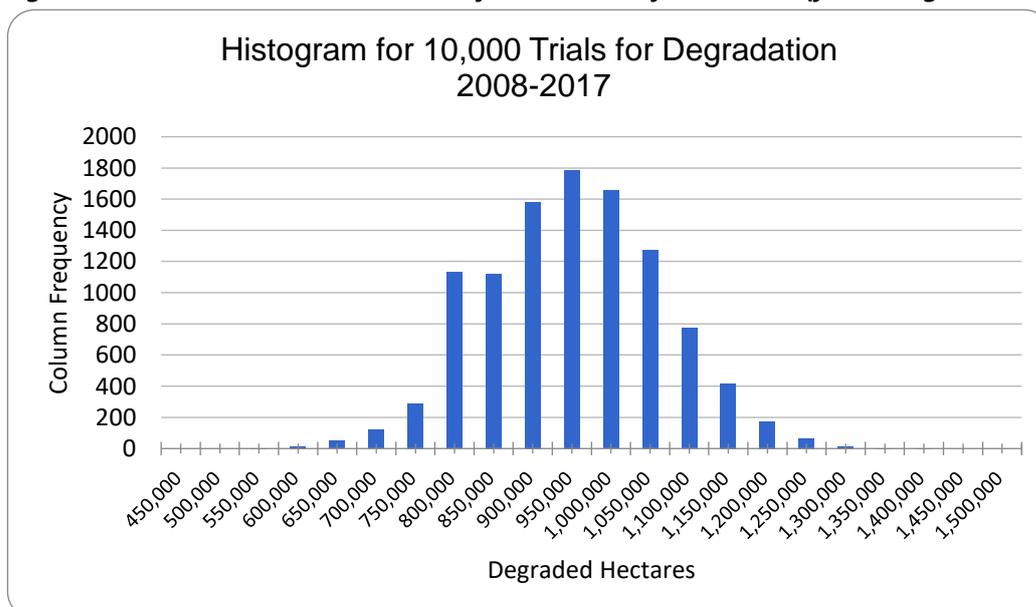
Activity Data	Area (hectares)	± 95% CI
Deforestation	491,341	69,379
Forest Degradation	931,506	213,078

Figure 12.1.1 Monte Carlo simulations for deforested area



For forest degradation activity data, the source of uncertainty is the error in the mapping of non-intact forest using the methodology by proxy. To estimate this error, we also followed Olofsson et al. (2013) using a simple random stratified approach of the non-intact forest area, over the entire accounting area, from 2008 to 2017. Other strata were designated as either stable non-forest or stable forest. Again, we ran 10,000 Monte Carlo simulations using Excel, following McMurray et al. (2017). Figure 12.2.2 shows the normal distributions of these simulations.

Figure 12.1.2 Monte Carlo simulations for non-intact forest areas (forest degradation)



For emission factors presented in the ERP, the sources of uncertainty are the sampling error of the forest inventory used to calculate carbon density in the above-ground biomass and the uncertainty of

the allometric equation to derive the below-ground biomass. For above-ground biomass, the complete dataset consists of 1,152 plots in the Peruvian Amazon. In the accounting area, the forest is stratified into three ecozones including, Selva Baja with 816 plots, Selva Alta Accessible with 192 plots, and Selva Alta Difícil with 131 plots. A stoichiometric ratio of 44/12 for the conversion of tons of carbon to tons of carbon dioxide equivalent was used for all carbon pools. Although some information has been lost over time, the FREL (2016) does indicate the total average carbon stock (i.e. total living tree biomass, which includes above-and below-ground biomass) for each ecozone and the 95% confidence interval, therefore Monte Carlo simulations can be run based on the assumption that the distribution is normal.

Figure 12.1.3 Monte Carlo simulations for carbon stock of the Selva Baja Ecozone

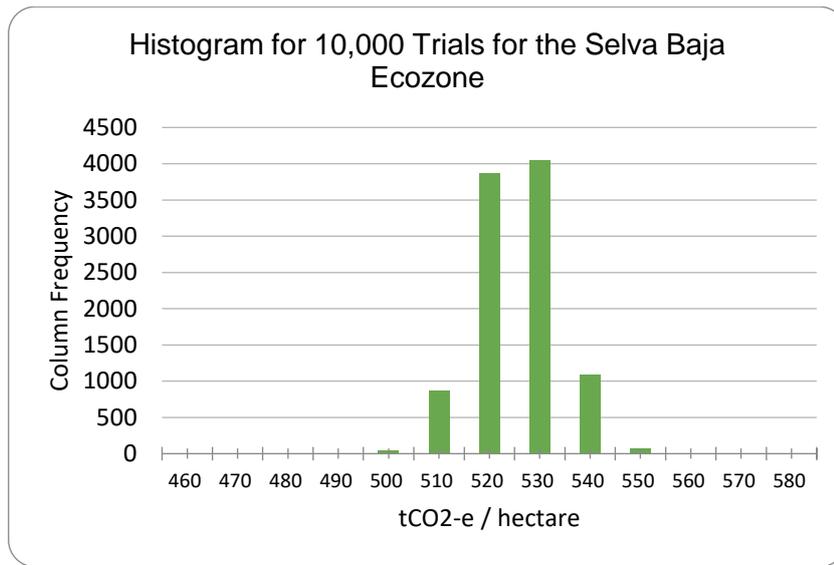


Figure 12.1.4 Monte Carlo simulations for carbon stock of the Selva Alta Accesible

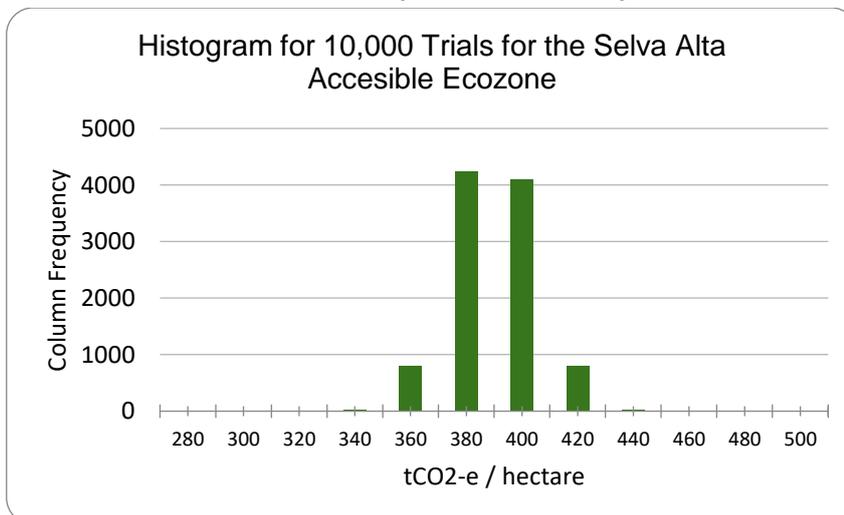
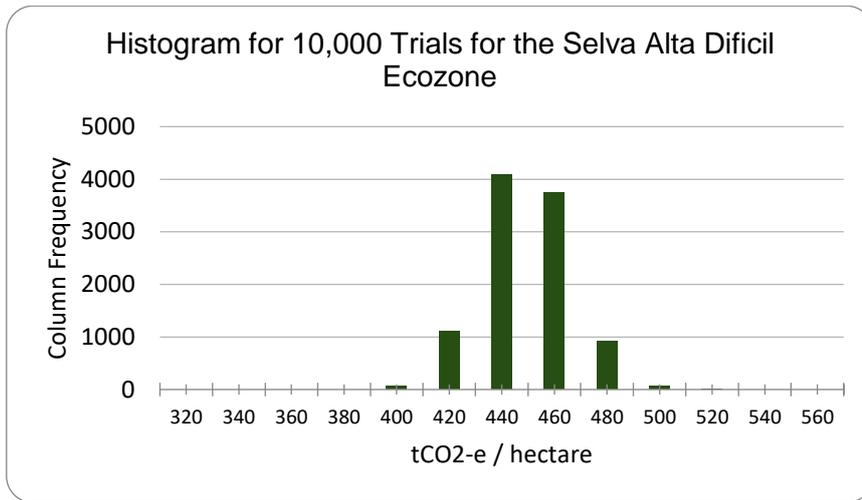


Figure 12.1.5 Monte Carlo simulations for carbon stock of the Selva Alta de Difícil Acceso



The stochastic numbers from emission factors (i.e. four in total – one per stratum) were weighted by the activity data (i.e. annual deforestation and annual forest degradation by proxy) per stratum to allow their combination with the single stochastic number from the activity data. The uncertainty of the total historic emissions was then estimated using the combined stochastic number as input data into 10,000 Monte Carlo simulations. The low uncertainties reflect the large number of simulations, which lead to small confidence intervals.

The Monte Carlo simulations resulted in an estimated uncertainty for deforestation activity data of 14.3% and an estimated uncertainty for forest degradation of 22.7% at the 95% confidence interval. Similarly, the uncertainty associated with emission factors was estimated between 2.9% of the mean for “Selva Baja”, 7.2% for “Selva Alta de Difícil Acceso” and 7.4% for “Selva Alta Accesible”.

The uncertainty of historical emissions from deforestation for the period 2008–2017), reflecting the combined uncertainty of activity data and emission factors, is estimated at 14.5% at the 95% confidence interval. The uncertainty of degradation emissions was not combined as for a proxy estimate, the conservativeness factor is by default set in 15%.

13. CALCULATION OF EMISSION REDUCTIONS

13.1 Ex-ante estimation of the Emission Reductions

The ER-P is expected to generate 26,774,276.7 CO₂-e of emission reductions (see Table 13.1.1 below). Excluding the appropriate conservativeness factor for deforestation, set to 0% as the overall uncertainty is below 15%, the default conservativeness factor¹⁰³ for degradation set to 15% and the 24% risk buffer (as quantified under Sections 11 and 12), the net ex-ante estimated GHG emission reductions amount to 21,592,158.7 tCO₂e during 5 years. Of these, the Program is expected to offer 6,430,000 tCO₂e to the Carbon Fund.

¹⁰³ The default conservativeness factor, according to the Methodological Framework, is 15% due to the use of the proxy-based approach for forest degradation emissions estimation. Uncertainty for deforestation was below 15%. Even if the ER to be produced by the ERP were estimated based on the reduction of deforestation, it is understood that the proposed activities will have an effect on degradation as well. For these reason, the conservativeness factor for degradation is applied to all ER.

Table 13.1.1 Ex-ante estimation of the ERs expected from the ER Program

ERPA term year t	Reference level (tCO ₂ e/yr)		Expected emissions under the ER Program (tCO ₂ e/yr)		Estimated Emission Reductions from Deforestation (without set-aside) (tCO ₂ e/yr)		Expected set-aside to reflect the level of uncertainty (tCO ₂ e/yr)	Expected set-aside to reflect the level of reversal risks (tCO ₂ e/yr)	Estimated Emission Reductions (tCO ₂ e/yr)
	Deforestation	Degradation	Deforestation	Degradation	Deforestation	Degradation			
1	23,941,389	9,845,700	20,869,536	9,845,700	3,071,852	-	-	737,245	2,477,300.1
2	23,941,389	9,845,700	18,741,301	9,845,700	5,200,087	-	-	1,248,021	4,193,618.7
3	23,941,389	9,845,700	17,764,630	9,845,700	6,176,758	-	-	1,482,422	4,981,256.9
4	23,941,389	9,845,700	17,209,638	9,845,700	6,731,751	-	-	1,615,620	5,428,831.3
5	23,941,389	9,845,700	18,347,561	9,845,700	5,593,828	-	-	1,342,519	4,511,151.7
Total	119,706,943	49,228,500	92,932,666	49,228,500	26,774,277	-	-	6,425,826	21,592,158.7

* Details of the total estimated emission reductions can be seen in the excel workbook “Reference Level and uncertainty”.

The resulting set-aside from uncertainty is equal to zero because the emissions reductions estimated for the ERP are based on the effects of avoided deforestation due to program activities implementation. It is understood that the proposed activities will have an effect on degradation as well, but was not calculated for the complexity of such estimations; and evidences the conservativeness of total ex-ante emissions reductions of the ERP. In the ex-post scenario, the results of the monitoring forest degradation will show the reductions achieved.

14. SAFEGUARDS

14.1 Description of how the ER Program complies with the World Bank's social and environmental safeguards and promotes and supports the safeguards included in the UNFCCC guide related to REDD+

The international framework for socio-environmental safeguards for REDD+ is established in the Decision 1/CP.16 UNFCCC. These safeguards, also known as the Cancun Safeguards, establish the guiding principles that countries should follow for establishing socio-environmental policies and criteria.

In parallel, the World Bank, as part of its commitment to sustainability, has recently established an environmental and social framework that replaces the Bank’s traditional Operational Policies. This new framework defines environmental and social standards (ESS) that projects supported by the Bank must comply with as part of their socio-environmental commitments. This new system became effective in October 2018 (see details in Annex 13, table.13.1). The standards have a preventive focus on the environmental social risks and impacts potentially presented by a project.

In this respect, a relation between the UNFCCC REDD+ Safeguards and the World Bank’s old Safeguard Policies have been established in a “common approach” as described in the FMT Note CF-2013-3,¹⁰⁴ since the Inter-American Development Bank (IDB) is involved in the administration of funds for the ER Program.

¹⁰⁴ See the document here:

https://www.forestcarbonpartnership.org/sites/fcp/files/2013/june2013/FMT%20Note%20CF-2013-3_FCPF%20WB%20Safeguard%20Policies%20and%20UNFCCC%20REDD%2B%20Safeguards_FINAL.pdf

The Table 13.2 in Annex 13 presents the IDB environmental and social policies contemplated under the common approach, and their relation with the new ESS.

14.1.1 National framework for Strategic Environmental and Social Assessment and Environmental and Social Management Framework Process

The evaluation of environmental and social safeguards applicable to REDD+ in Peru is being developed through a participatory process aimed at generating a National Safeguards Approach, which allows for harmonized responses to Peru's various safeguards commitments, including the World Bank's requirements. To comply with these requirements, preliminary¹⁰⁵ versions of the Strategic Environmental and Social Assessment (SESA)¹⁰⁶ and Environmental and Social Management Framework (ESMF)¹⁰⁷ of the National Forests and Climate Change Strategy have been developed, involving the participation of about 450 participants between March and June 2017¹⁰⁸.

The preliminary SESA arrived to the following conclusions: 1) Many of the environmental and social risks and threats related to the implementation of the National Strategy on Forests and Climate Change (ENBCC, by its initials in Spanish) have been mitigated by actions within the Strategy; 2) the Strategy's actions and lines of implementation are consistent with REDD+'s strategic objectives; and 3) weaknesses in inter-sector articulation and institutional arrangements for the implementation of the ENBCC are being addressed by MINAM's proposal on Forest Governance and Climate Change, with the intention of creating a common multi-sectorial and complementary vision to overcome the challenges of coordinating public and private actors. This vision would be applicable to all projects and programs arising from the National Strategy on Forests and Climate Change. Furthermore, preliminary SESA underlines the following risks to the implementation of the ENBCC: weak governance, corruption, discontinuity due to government transitions, lack of participation and social conflicts, and difficulty of financing.

The preliminary national ESMF has compared the safeguards of the World Bank and those of Cancun, and grouped the mitigation measures into thirteen thematic blocks: 1. Measures for the promotion and strengthening of intersectoral and multilevel coordination; 2. Measures to strengthen institutional capacities for public management; 3. Measures to support land titling processes; 4. Measures to strengthen forest management processes; 5. Measures to promote dialogue and collaboration among stakeholders; 6. Measures to reduce the opportunity cost of the measures suggested in the ENBCC; 7. Measures to address corruption; 8. Measures to support communication and dissemination of information among actors; 9. Measures to strengthen forest monitoring and control; 10. Measures for the prevention of social conflicts; 11. Measures for the promotion of indigenous peoples rights; 12. Measures to promote the involvement of local communities and indigenous peoples; 13. Measures to promote the development of technical information for REDD+ Actions' implementation.

¹⁰⁵ The SESA and ESMF are preliminary in the sense that the national validation of REDD+ actions is still on-going. Check the road map at table 14.2.1 for details about its update.

¹⁰⁶ See the document here:

http://www.minam.gob.pe/cambioclimatico/wp-content/uploads/sites/127/2019/01/13753_Producto-Bloque-1_revisi%C3%B3n-esp%C3%B1ol1.pdf

¹⁰⁷ See the document here:

http://www.minam.gob.pe/cambioclimatico/wp-content/uploads/sites/127/2019/01/13753_Producto-Bloque-3_Final1.pdf

¹⁰⁸ See the systematization of the participation process here:

<http://www.minam.gob.pe/cambioclimatico/wp-content/uploads/sites/127/2019/02/ARCADIS-Resumen-del-Proceso-de-Consulta-y-Participaci%C3%B3n-EESA-MGAS-SIS-documento-de-trabajo.pdf>

14.1.2 Application of the social and environmental management framework in the ER Program

The ERP is an opportunity for the Peruvian government to provide elements for the national discussion regarding REDD+ safeguards, which will help in improving and providing input to the national safeguards approach. In this regard, the preliminary national SESA and ESMF become key inputs in the development of the specific safeguard tools required for the ER Program, which will fall under the umbrella of the evolving National Safeguards Approach (see Annex 13 for more details on the national process).

The design of the ER Program's SESA and ESMF are in progress, and are expected to be concluded by October 2019, following the roadmap provided in Table 14.2.1, as well as the Environmental and Social Commitment Plan (ESCP), which will set out measures and actions required for the ER Program to achieve compliance with the World Bank's ESS over a specified timeframe¹⁰⁹.

The Peruvian government recognizes the need to listen, dialogue and build transparent mechanisms, processes, and actions through effective stakeholders' participation. Specifically, as part of the ER Program's safeguards tools, a stakeholder engagement plan and a plan for indigenous peoples is being designed (see Annexes 8 and 9 for the preliminary documents and the section 5 for more details).

Finally, Peru has an Action Plan on Gender and Climate Change¹¹⁰ that aims at promoting and strengthening the mainstreaming of gender. This plan will be a primary input for the ER Program's safeguards design. The ER Program's ESMF will include specific measures to ensure culturally appropriate gender integration. Furthermore, the National Safeguard Information Module and both the National and ER Program Mechanism for Citizen Attention (MAC) will include gender indicators.

Risk and impact¹¹¹ identification

The ER Program is based on several public and private investment projects, as well as international cooperation projects. With respect to the latter, projects have developed their own Environmental and Social Assessment (ESA), which identify and evaluate the main activities' risks and impacts that fuel the ER Program actions¹¹². MINAM has carried out a specific participatory process for risk and impact identification for the ER Program with the regional governments of Ucayali and San Martín through 8 workshops (4 in Ucayali, 3 in San Martín, and 1 in Lima)¹¹³, involving 255 participants from indigenous peoples, small farmers, private enterprises, national and subnational state institutions, involved projects, NGOs and civil society in general.

To evaluate impacts and risks of the ER Program's interventions, the methodology described in Table 13.3 in Annex 13 was used.

Results of the risk and impact evaluation

109 For more details see road map in Figure 14.2.1

110 See the plan: <http://www.minam.gob.pe/cambioclimatico/wp-content/uploads/sites/11/2015/12/PLAN-G%C3%A9nero-y-CC-16-de-JunioMINAM+MIMP.pdf>

111 For the ER Program interventions' risks and impacts to be assessed, the evaluation team considered as a risk the following: 1) the potential negative environmental and social effects of the activities and 2) the external factors that may affect negatively the implementation of the activities.

112 See table 13.6 in Annex 13 for the analysis of project safeguards and actions for their compliance within the ER Program ESMF.

113 See details in Annex 10.

To date, a preliminary SESA of the ER Program has been elaborated. Fifty-four risks were identified (listed in Table 13.4 in Annex 13), 27 of which have been classified as environmental and 27 as social. The outcome of the stakeholder consultations resulted in a risk and impact prioritization matrix (Table 14.1.1). Additionally, potential positive impacts of the ER Program's strategic lines and interventions were also identified (see Table 14.1.2). Finally, Table 13.5 in Annex 13 presents the analysis of the relationship between the World Bank's ESS applicable to the interventions and Peru's existing national legal-institutional framework that supports compliance. Table 14.1.3 shows a general summary of this relationship.

The results of this analysis (Tables 13.4 and 14.1.1) suggest that the Bank's ESS that are relevant for Program's intervention include:

- ✓ ESS1: Assessment and Management of Environmental and Social Risks and Impacts
- ✓ ESS2: Labor and Working Conditions
- ✓ ESS3: Resource Efficiency and Pollution Prevention and Management
- ✓ ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
- ✓ ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ✓ ESS7: Indigenous Peoples/Sub-Saharan African Historically Under-served Traditional Local Communities
- ✓ ESS8: Cultural Heritage
- ✓ ESS10: Stakeholder Engagement and Information Disclosure

Risk and impacts prioritized

The number of risks identified is significant and stakeholders recommended that they should be systematized and "packaged" into similar lines of action. Seven major lines or groups have been created, including: i) Land Classification, Zoning, and Titling; ii) Technical Assistance; iii) Labor and Working Conditions; iv) Governance; v) Participation, Information and Transparency; vi) Management and Efficiency of Use of Natural Resources; and vii) Social Conflicts.

Table. 14.1.1 Analysis of the Bank's ESS related to priority risks

Risks	Details	WB Standard	Measures
Classification and forest zoning and titling of native communities	<ul style="list-style-type: none"> • Boundaries conflicts. • Overlapping of native communities with Permanent Production Forests (BPP). • Long and complex processes of titling and zoning. • Once the titled is granted, the risk of renting the titled lands, or transfer the forest rights to third parties that 	ESS 5	<ul style="list-style-type: none"> • To reinforce with intercultural communicators, the communication with neighbors to the area to be titled, improving the dialogue with native communities. • To promote a fast implementation involving different entities as SERFOR for a re-measurement of BPP in favor of native communities. • To develop concertation spaces with involved public entities to generate a faster and more efficient process.

	could cause indirectly illegal logging and deforestation.		<ul style="list-style-type: none"> To develop a participation plan for Indigenous People.
Technical assistance	<ul style="list-style-type: none"> Technical assistance without cultural pertinence could weaken governance structure of indigenous people. Technical assistance that promotes an improvement in yield that could increase the pressure with forest lands. Technical assistance without a strategy of intervention linked with community, local, regional and national development plans may affect the sustainability of the interventions. Technical assistance without an exit strategy may create negative effects when the intervention ends. 	ESS 7 ESS 6 ESS 3	<ul style="list-style-type: none"> To involve the indigenous organizations in the provision of technical assistance, ensuring appropriate intercultural personnel. To promote the coordination among different projects, entities and ministries to define a roadmap about technical assistance. To strengthen the forest control and surveillance and to develop incentives to avoid impact on forest cover lands. To incorporate priority criteria in the technical assistance to community, regional and national plans to ensure linkage between them. To promote the technical assistance incorporating gender, intercultural and intergenerational approaches to ensure sustainability. To establish an exit strategy that ensures an appropriate technical assistance to the beneficiaries.
Work and labor conditions	<ul style="list-style-type: none"> Inadequate labor and social conditions, without health and safety at work protocols, mainly in field works. Conflicts between rural workers and communities, affecting the interventions. Inexistence of grievance mechanisms for workers and beneficiaries of the interventions. 	ESS 2	<ul style="list-style-type: none"> To establish alliances with other public entities as SUNAFIL (the National Superintendence of Labor Surveillance, created by Law N° 29981), the National Commission of fight against forced work, the National Committee to Prevent and Eradicate child labor. To have protocols for a good field coexistence, safety handbooks. To train in labor health and safety. To develop guidelines for labor management procedures. To develop guidelines for a Response Plan in case of emergencies. Implementation of a MAC for ER Program.
Governance	<ul style="list-style-type: none"> Long and complex administrative procedures that affect the intervention planning. 	ESS 3	<ul style="list-style-type: none"> To institutionalize the project and incorporate nominated personnel during implementation stage.

	<ul style="list-style-type: none"> • High rotation of authorities, directives and specialists. • Entities do not coordinate and cannot implement the proposed measures. 		<ul style="list-style-type: none"> • To establish a consultative committee of the projects where key entities participate. • To involve the public entities to make administrative processes go faster.
Participation, Information and transparency	<ul style="list-style-type: none"> • Obsolete and deficient information affect the development of the program. • Key actors do not participate in the program. • Inadequate, null or few effective participative and dialogue spaces, especially for indigenous peoples. 	ESS 10 ESS 6	<ul style="list-style-type: none"> • To establish a communication and information plan, which includes actions that ensure a fluid information. • Implementation of a MAC for ER Program. • To develop a Stakeholders Participation and Engagement Plan with gender and intercultural approaches. • To develop a participation plan for indigenous people.
Efficient management on natural resources use	<ul style="list-style-type: none"> • Presence of plagues, diseases and forest fires. • Absence of guidelines for forest sustainable management that could increase the pressure on forests. 	ESS 3 ESS 6	<ul style="list-style-type: none"> • To design and implementation of protocols (that include guidelines) for management of plagues, diseases and forest fires. • To link with SENAMHI to access to hot points information. • To develop guidelines for a biodiversity action plan. • To develop guidelines for forest management plans (commercial and small-scale activities)
Social conflicts	<ul style="list-style-type: none"> • Inexistence of a social action plan. • Absence of protocols for citizen participation. • Absence of capacity, knowledge and information about indigenous rights could increase social conflicts. 	ESS 7 ESS 3	<ul style="list-style-type: none"> • Design and implementation of a social action plan. • To develop a Stakeholders Participation and Engagement Plan with gender and intercultural approaches. • Implementation of a MAC for ER Program. • Ex-ante dialogue spaces with involved actors, applying a conflict prevention approach.

Table 14.1.2. Potential positives impacts of the Strategic Lines and interventions of the ER Program

Strategic Lines	Intervention	Positive Impacts
1. Conserving and increasing the value of forests	1.1. Classification, zoning and titling of forests with unassigned rights	- Increase in forests with assigned rights result in fewer threats of illegal deforestation.
	1.2. Strengthening community governance of forest	- Reduced land speculation. - Increase in titled indigenous lands.
	1.3. Conservation of forests in protected natural areas	- Reduction in unilateral or illegal land use changes.
	1.4. Community forest management (CFM) for wood and non-timber products	- Areas with assigned rights have a greater potential for sustainable productive activities. - Application of national socio-environmental safeguards in spatial planning.
	1.5. Sustainable forest management in forestry concessions	- Development of indigenous developments plans (<i>planes de vida</i>) formulated by indigenous communities. - Greater order in the processes of zoning, forest management and community forest management. - Increase in protected areas. - Increased management capacities of indigenous communities. - Increased income for indigenous communities.
2. Increase the productivity, intensification and competitiveness of climate-friendly production systems	2.1. Assignment of rights to owners without title	- Improvement of production techniques for sustainable products reduces pressure on forests. - Leveraging of public and private investment in sustainable and competitive productive models. - Promotion of food security - Promotion of improved environmental performance of private companies (use of socio-environmental standards to receive credits, etc.).
	2.2. Promotion of increased productivity, intensification and quality of coffee, cocoa and oil palm in deforested areas	- Development of credit schemes for producers lacking credit. - Restoration and conservation of degraded areas. - Increasing links with markets that value sustainability.
	2.3. Strengthen familiar agriculture from a subsistence level to a level that generates surplus for markets	- Increases in income and commercial opportunities for farmers. - Increased technical, organizational, and commercial capacities of producers.

	2.4. Promotion of commercial reforestation by businesses	<ul style="list-style-type: none"> - Reduced transaction costs of value chains. - Greater inclusion (women, youth, migrants). - Reduced land speculation.
3. Investment promotion and off-farm job creation by green businesses	3.1. Promotion of private investment in low-emission agro-industrial or silvoindustrial activities	<ul style="list-style-type: none"> - Increase income and economic opportunities off-farm in order to reduce pressure on forests. - Generation of multi-stakeholder participation and consensus via regional platforms and roundtables. - Inclusion of sustainable criteria in stakeholder commitments and voluntary certifications. - Leverage of public and private investments for sustainable productive and competitive models. - Improvement of green development based on environmentally friendly and profitable commercial products and green value chains. - Increased use of emissions reductions to compensate environmental impacts of businesses. - Increased value of forests as a result of PES.
	3.2. Facilitate use of ERs from reduced deforestation by businesses in Peru and elsewhere, as well as PES	
4. Improve institutional enabling conditions	4.1. Alignment and coordination of sectors and different levels of government	<ul style="list-style-type: none"> - Generation of multi-stakeholder consensus on regional platforms and roundtables. - Increased conservation and reduction of deforestation pressure. - Integration of policies across sectors. - Greater use of environmentally friendly policies. - Inclusion of environmental criteria in evaluation of PIPs. - Increase in areas with assigned rights resulting in less threats of illegal deforestation/land speculation. - Decrease in agriculture in forest areas or natural forests. - Development and implementation of indigenous forest monitoring, planning, and surveillance tools and capacities. - Use of information technologies and virtual platforms for the generation of early warnings of deforestation and better control of forest use. - Better planning, implementation, and monitoring of public and private sector activities. - Improved public education and access to information. - More capable institutions.
	4.2. Establish regional and national policies to avoid land use change authorizations, promote local forest management, and link deforestation reduction targets with additional public finance.	
	4.3. Classification, zoning and titling of land and forests	
	4.4. Monitor, control and enforce rights to land and natural resources	
	4.5. Improve the availability, access and use of information, especially at the regional level	
	4.6. Increase institutional resources and capacities	

Table 14.1.3. The World Bank's ESS applicable to the Program, the national legal support framework and the institutions with competence in these aspects.

WB ESS Applicable to Interventions	National Law's Framework*	Institutional Competence
<p>ESS1: Assessment and Management of Environmental and Social Risks and Impacts: assesses the environmental and social risks and impacts of a project throughout the project life-cycle.</p>	<p>Law of the National System of Environmental Impact Evaluation, Law 27446 of April 23, 2001, which was modified June 28, 2008 via Legislative Decree No 1078. It was regulated in 2009 with Supreme Decree No. 019-2009- MINAM. http://www.minam.gob.pe/wp-content/uploads/2013/10/Ley-y-reglamento-del-SEIA1.pdf.</p> <p>General Law of the Environment - Law 28611 15 October 2005.</p> <p>Framework Law for the National System of Environmental Management, Law N° 28245.</p> <p>Forestry and Wildlife Law - Law 29763 of July 22, 2011, and its regulations.</p> <p>Law of private investment in the development of economic activities in the lands of the national territory and of peasant and native communities-Law 26505 of June 17, 1995.</p> <p>Law of Indigenous Communities and Agrarian Development of the High and Low Jungle - Law 22175, 9 May 1978.</p> <p>ILO Convention 169 and the United Nations Declaration on the Rights of Indigenous Peoples.</p> <p>Law of prior consent of indigenous peoples.</p> <p>Law of Regional Governments - Law 27867 of November 18, 2002.</p> <p>National environmental requirements: Land Management (OT); Forest Management (OF); Timber Forest Inventory; Non-Timber Forest Inventory.</p>	<p>MINAGRI (SERFOR, SINAFOR), OSINFOR, MINAM, OEFA, MINCUL, Public Ombudsman Office, SUNARP, Regional Governments</p>
<p>ESS2: Labor and Working Conditions: recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth.</p>	<p>Legislative Decree 885 (10/11/96) Law for the Promotion of the Agrarian Sector.</p> <p>ILO Convention 169 and the United Nations Declaration on the Rights of Indigenous Peoples.</p> <p>Supreme Decree N° 003-97-TR (27/03/97); Legislative Decree 728, Law of Labor Productivity and Competitiveness.</p> <p>Law N° 26970 (17/05/1997), Law of modernity in social security in health.</p> <p>Supreme Decree N° 002-98-AG (17/01/1998), approves the Regulations of the Law of Promotion in the Agrarian Sector.</p> <p>Law No. 28806, General Labor Inspection Law of July 2006.</p>	<p>MINAGRI, Min.Trabajo, SUNAFIL, Public Ombudsman Office</p>

<p>ESS3: Resource Efficiency and Pollution Prevention and Management: recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels.</p>	<p>General Environmental Law - Law 28611 of October 15, 2005. Regulation on the Registration, Placing on the Market and Control of Agricultural Pesticides and Related Substances DS No 15-95-AG, June 1995. Law for the Promotion of Integrated Pest Management-Law N° 26744, 1997. Legislative Decree approving the General Agrarian Health Law DS No. 1059 June 2008. Law of Environmental Evaluation and Supervision, Law 29325, 5 March 2009. Forest and Wildlife Law - Law 29763, 22 July 2011. Water Resources Law - Law 29338 of March 31, 2009. Law on the Conservation and Sustainable Use of Biological Diversity - Law 26839 of August 19, 1998</p>	<p>MINAGRI, MINAM, OEFA, SINEFA, SENASA</p>
<p>ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement: involuntary resettlement should be avoided. Where involuntary resettlement is unavoidable, it will be minimized and appropriate measures to mitigate adverse impacts on displaced persons (and on host communities receiving displaced persons) will be carefully planned and implemented.</p>	<p>Law of Indigenous Communities and Agrarian Development of the High and Low Jungle - Law 22175, 9 May 1978. ILO Convention 169 and the United Nations Declaration on the Rights of Indigenous Peoples. Law No. 29785 Law on the Right to Prior Consultation of Indigenous or Originating Peoples, recognized in ILO Convention No. 169. Forestry and Wildlife Law - Law 29763 of July 22, 2011. Organic Law of Regional Governments - Law 27867 of November 18, 2002. Some other regulations with legal basis for land titling.</p>	<p>MINAGRI, SERFOR, MINCUL, MINAM, Ombudsman's Office, Regional Governments</p>

<p>ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources: recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support; also addresses the sustainable management of primary production and harvesting of living natural resources, and recognizes the need to consider the livelihood of project-affected parties, including indigenous peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project.</p>	<p>Law of Protected Natural Areas - Law 26834, of July 4, 1997. Regulation of the Natural Protected Areas Law Supreme Decree 038 of June 22, 2001-AG. Forestry and Wildlife Law - Law 29763 of July 22, 2011 and its Regulations: 1) DS N° 018-2015-MINAGRI approving the regulations for forest management; https://www.serfor.gob.pe/wp-content/uploads/2016/03/REGLAMENTO-PARA-LA-GESTION-FORESTAL-1.pdf D.S. N° 019-2015-MINAGRI, approving the regulations for wildlife management; https://www.serfor.gob.pe/wp-content/uploads/2016/03/REGLAMENTO-PARA-LA-GESTION-DE-FAUNA-SILVESTRE.pdf D.S. N° 020-2015-MINAGRI, approving the regulations for the management of forest plantations and agroforestry systems https://www.serfor.gob.pe/wp-content/uploads/2016/03/REGLAMENTO-PARA-LA-GESTION-DE-LAS-PLANTACIONES-FORESTALES-Y-LOS-SISTEMAS-AGROFORESTALES.pdf D.S. N° 021-2015-MINAGRI approving the regulations for forest and wildlife management in native communities and peasant communities. https://www.serfor.gob.pe/wp-content/uploads/2016/03/REGLAMENTO-PARA-LA-GESTION-FORESTAL-Y-DE-FAUNA-SILVESTRE-EN-COMUNIDADES-NATIVAS-Y-CAMPESINAS.pdf Organic Law for the Sustainable Use of Natural Resources -Law 26821, 26 June 1997. Law on the Conservation and Sustainable Use of Biological Diversity - Law 26839 of August 19, 1998.</p>	<p>MINAGRI, Min.Trabajo, SUNAFIL, Public Ombudsman Office</p>
<p>Environmental and Social Standard 7 (ESS7), Indigenous Peoples/Sub-Saharan African Historically Under-served Traditional Local Communities: ensures that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource- based livelihoods of indigenous peoples.</p>	<p>Legislative Resolution No. 26253. Approval of ILO Convention 169, adopted by Peru on 27 June 1989. Law of private investment in the development of economic activities in the lands of the national territory and of peasant and native communities-Law 26505 of June 17, 1995. Law of Indigenous Communities and Agrarian Development of the High and Low Jungle - Law 22175, 9 May 1978. Law for the Protection of Indigenous or Originating Peoples in Situation of Voluntary Isolation or Initial Contact - Law 28736 of May 2006. Law No. 29785, Law on the Right to Prior Consultation of Indigenous or Originating Peoples, recognized in ILO Convention 169. It establishes the right of IPRs to be consulted by the</p>	<p>MINCUL, SERFOR, MINAM, SERNANP, Public Ombudsman Office</p>

<p>Environmental and Social Standard 8 (ESS8), Cultural Heritage: establishes measures designed to protect cultural heritage. Includes tangible cultural heritage and Intangible cultural heritage like practices, representations, expressions, knowledge, skills, etc.</p>	<p>State before deciding administrative or legislative measures that may directly affect their collective rights.</p> <p>Regulations to Law No. 29785, Law on the Right to Prior Consultation of Indigenous or Originating Peoples recognized in ILO Convention No. 169, S.D. No. 001-2012-MC.</p> <p>Law No. 29735. Law that regulates the Use, Preservation, Development, Recovery, Promotion and Dissemination of the Native Languages of Peru.</p> <p>Supreme Decree No. 004-2012-MIMP approving the National Gender Equality Plan 2012-2017 consists of 8 strategic objectives, the first of which seeks to promote and strengthen the mainstreaming of the gender perspective at the three levels of government, and in SO 5 seeks to guarantee the economic rights of women under conditions of equity and equal opportunities with men.</p> <p>Law No. 27811 of July 24, 2002. Establishes the Regime for the Protection of Collective Knowledge of Indigenous Peoples Linked to Biological Resources.</p> <p>General Law for the Protection of the National Cultural Heritage.</p> <p>Special Regime for the Administration of Communal Reserves - Resolution of Intendance 019 of June 24, 2005.</p> <p>Peru is a signatory to several international agreements and treaties that it must respect, such as the Convention for the Protection of the World Cultural and Natural Heritage. Established by UNESCO in Paris on 16 November 1972 and ratified by Peru in 1981</p> <p>The Certificate of Non-existence of Archaeological Remains (CIRA) is an official document issued by the National Institute of Culture through which it is pronounced officially and technically in relation to the content or not of archaeological remains in a terrain.</p> <p>General Law of the National Cultural Patrimony (Law No 28296). Text of Administrative</p>	<p>MINCUL, MINAM, SERNANP</p>
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<p>Environmental and Social Standard 10 (ESS10), Stakeholder Engagement and Information Disclosure: effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.</p>	<p>Law on the Right to Prior Consultation, and its Regulations. Convention 169 (ILO). Regulation of Law N° 29785 Law of the Right to Previous Consultation of Indigenous Peoples Recognized in Convention 169 of the ILO, D.S. N° 001- 2012-MC establishes mechanisms in order to assure consultation that permits an intercultural dialogue between the State and indigenous peoples.</p> <p>Forestry and Wildlife Law (LFFS), and its Regulations.</p> <p>National Authority for Transparency and Access to Public Information, establishes a mechanism for requesting and accessing public information, considers the right of the person to access "adequately and timely" public information related to forest and wildlife management.</p> <p>Information on the budget of public entities related to forestry and environmental activities is public and accessible to interested parties.</p> <p>Conflict resolution: Specialized environmental prosecutor's offices, Social Management Secretariat and Dialogue within the Presidency of the Council of Ministers.</p> <p>The Public Authority is responsible for proposing the process and/or mechanism for effective participation.</p> <p>General Law of the Environment. National Forest and Climate Change Strategy (EN BCC).</p> <p>National Authority for Transparency and Public Information.</p> <p>Peru is the signatory of various international agreements and treaties such as:</p> <p>Convention on the elimination of all forms of discrimination against women CEDAW, 1982.</p> <p>National Plan for Gender Equity 2012-2017.</p>	<p>MINCUL, SERFOR, MINAM, SERNANP, Ombudsman's office</p>
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14.2 Description of arrangements to provide information on safeguards during ER Program implementation

The MINAM, as the national focal point for REDD+, is responsible for monitoring and reporting on how the safeguards for REDD+ are being addressed and respected at the national level, through the Safeguards Information Module (SIM). In this regard, the ER Program will use the established procedures for the SIM, and will provide information for the Module.

Preliminary progress in the design of the National Safeguard Information Module

The main objective of the National Safeguards Information Module is to gather, manage, and disseminate information related to the implementation and enforcement of safeguards for REDD+ actions, in accordance with the Peruvian legal framework. In turn, the SIM will generate reports required by the UNFCCC or other programs for monitoring compliance with safeguards related to REDD+ activities. This Module is under development¹¹⁴ and needs to incorporate institutional arrangements and indicators, which are also presently being developed by MINAM. The module will be hosted in the SINIA (MINAM) and then, under a stepwise approach, will be made inter-operable with the SNIFFS (SERFOR). It is expected that its design will be completed by December, 2019 and will be implemented in 2020¹¹⁵.

This Module will:

- Collect primary social, economic and environmental data and information on the implementation of REDD+ Actions, differentiated by level (national, regional, local).
- Have standardized structures for data collection, processing, and analysis.
- Systematically store data and make it available.
- Generate internal, national, and international reports.
- Communicate available information in order to contribute to the transparency of the REDD+ process in Peru.
- Evaluate and provide feedback on the implementation of safeguards, assessing the impacts of mitigation activities and generating knowledge and lessons learned.

The process of participatory safeguard monitoring in general will be analyzed in greater detail during the development of the SIM, since various participatory community monitoring models are presently being used by other projects. Outputs and conclusions from this analysis will be incorporated into the formal institutional arrangements that will be implemented by the ER Program.

Capacity building related to participatory monitoring is being developed in the regions, including San Martin and Ucayali. Relevant themes include: community forest management, forest monitoring legal framework, interpretation and management of information derived from satellite monitoring, and community-based monitoring (CBM). Furthermore, indigenous organizations in the ER Program accountability area are being

¹¹⁴ See the details in *Table 14.2.1 Safeguards Road Map*

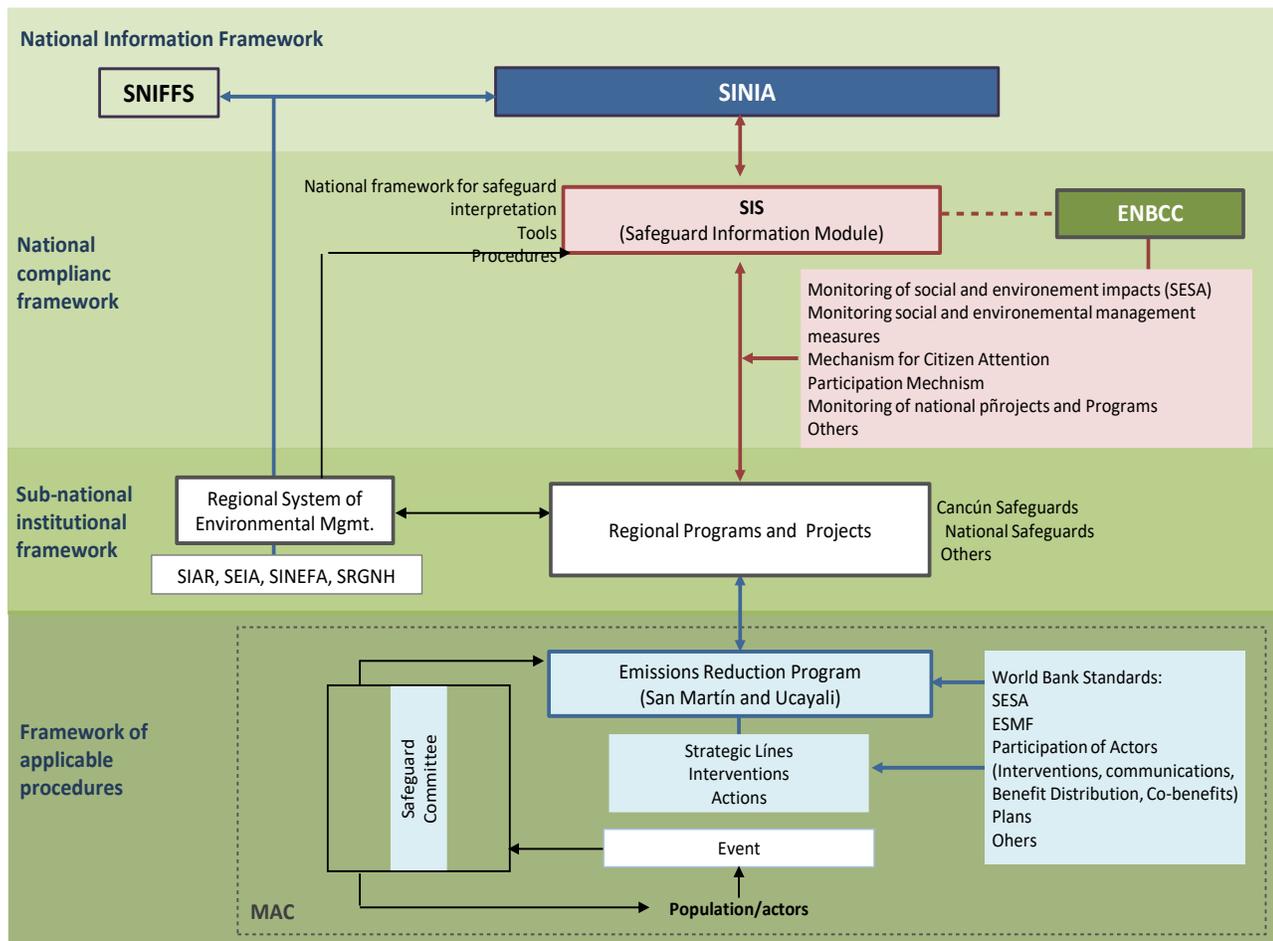
¹¹⁵ See the details in *Table 14.2.1 Safeguards Road Map*.

trained in forest monitoring legal framework, GPS and geographic localization, map use and interpretation, protocols for forest monitoring, intervention protocols, and reporting requirements.

Arrangements to provide information on safeguards during ER Program implementation

The ER Program will provide information on safeguards to the National Safeguards Information Module; local and regional information will be added on this system as showed in the diagram 14.2.1.

Figure 14.2.1 The Safeguards Information Module and the ER Program.



The ER Program consists of a number of on-going projects and proposed activities in the accounting area (see section 2.3 and 6.2). Public and private projects in the design phase will adopt the ER Program ESMF. On the other hand, an analysis of gaps between on-going projects' environmental and social management frameworks and the ER Program framework will be carried out to identify gaps that need to be filled in order

to comply with the safeguards established for the ER program¹¹⁶. Safeguards' results will be collected by the Program Management Units of the Regional Governments of San Martin and Ucayali¹¹⁷.

This information will be consolidated in a regional or supra-regional entity, depending on the institutional arrangements that will be defined during the design of the SIM¹¹⁸. Finally, the information resulting from the monitoring of the safeguards linked to the ER Program will be communicated to the national level. This entity will evaluate and provide feedback on the implementation of safeguards, generating internal, national, and international reports, as required.

Table 14.2.1 presents the roadmap of safeguard-related activities.

Table 14.2.1 Safeguards Road Map

Number	Activities	2019												2020	
		Months													
		1	2	3	4	5	6	7	8	9	10	11	12		
1	Develop and strengthen technical and institutional capacities of MINAM														
2	Determine the processes requiring actor participation														
3	National Strategic Environmental and Social Assessment (SESA)														
	Update of SESA including the World Bank's ESS and inputs from the ER Program process														
	Consultation and participation														
	Updated version of SESA														
4	Safeguards monitoring and evaluation														
	National Environmental and Social Management Framework's update (ESMF)														
	Consultation and participation														
	Design and development of safeguard monitoring and evaluation tools.														
	Institutional arrangements														
	Implementation of safeguards monitoring and evaluation														
5	Participatory Monitoring														
	Analysis of relevant themes														
	Formulation of monitoring tools and procedures														
	Local training														
6	Strategic Environmental and Social Assessment of the ER Program														
	Methodological Design														
	Analysis of existing environmental and social assessments, risks, and impacts relevant to the ER Program (national SESA, project's safeguard frameworks).														

¹¹⁶ See Table 13.6 in Annex 14 for the analysis of project safeguards and actions for their compliance within the ER Program ESMF.

¹¹⁷ See chapter 6.1 for details on institutional arrangements and implementation governance.

¹¹⁸ See the details in Table 14.2.1 Safeguards Road Map.

safeguards commitments, including the World Bank's requirements.

In compliance with the framework of transparency and national participation, the MAC will be designed to be accessible, collaborative and effective in resolving concerns through dialogue, agreements, joint research, negotiation, commitments and problem solving. It is envisioned as being complementary to existing channels and does not substitute for or impede formal legal channels for complaints or grievances such as the police, the judicial or administrative system, the Ombudsman's Office, the Public Prosecutor's Office, the national Courts, and others, nor does it prevent civil society or vulnerable populations from fulfilling their own rights at the local, regional, national, or international levels.

Citizen Attention Mechanism (MAC) for the ER Program

The ER Program MAC is an organizational system that will attend the questions, consultations and/or complaints related to the design and implementation of the Program's activities, including participation, benefit-sharing issues and the application of socio-environmental safeguards. It will allow feedback and enhance expected results, accountability, identification of negative impacts, and conflict prevention. Some objectives of the National MAC are the objectives of the ER Program specific mechanism.

The ER Program MAC will be based on existing regional platforms for citizen attention, with a logic of contributing to strengthened institutionality without the duplication of efforts. The design of the mechanism should ensure adequate channels for receiving complaints, claims, suggestions and requests for information from citizens in order to provide answers and solutions linked to the program with cultural relevance.

In this regard, the ER Program MAC will include gender and intercultural approaches, especially the needs of indigenous peoples and women for information access and for channeling their demands related to conflict resolution. Likewise, in order to increase citizen access, this mechanism will incorporate various channels for communication including face-to-face, virtual, email, fixed and mobile telephony contacts.

Channels for communication include:

- a face-to-face channel, via a citizen service platform and its decentralized spaces, including the minutes of meetings and workshops where relevant information is collected directly;
- a virtual channel, based on emails and institutional Internet portals, and includes the email for complaints regarding access to information; and
- a telephone channel;
- In the case of local and rural issues, the use of a Program complaints book in the offices of local, regional governments, indigenous organizations, or other local public entities is being evaluated.

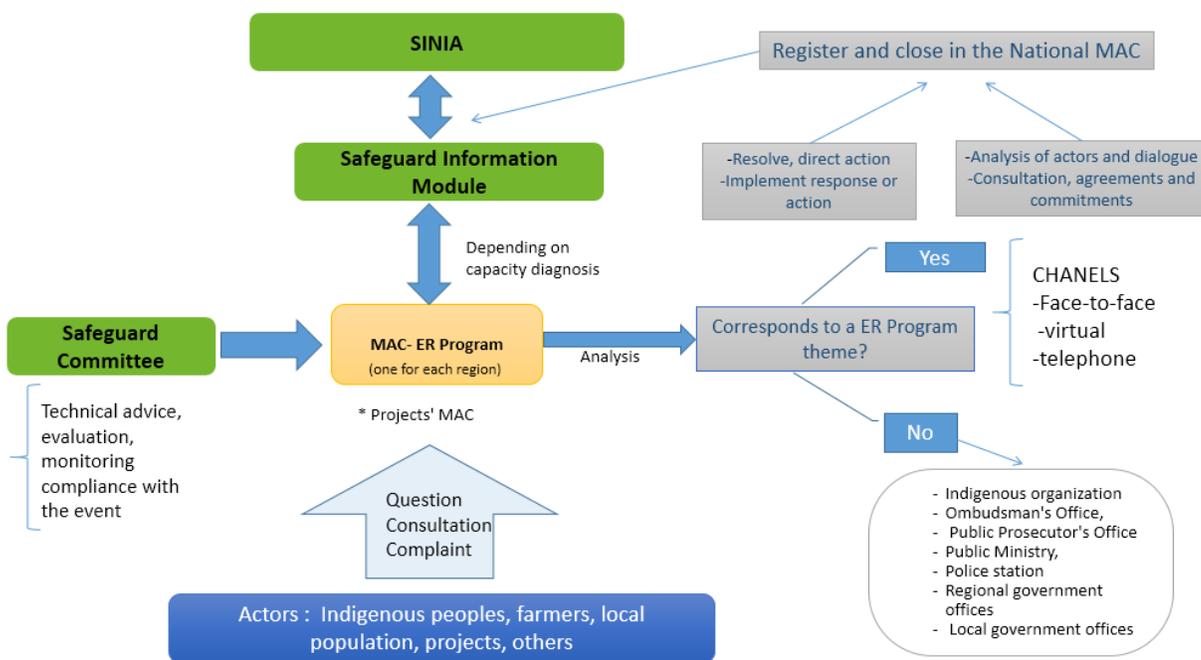
Receipt and response procedures within the MAC-ER Program

As shown in Figure 14.3.1, citizen questions, consultations and complaints will be communicated through multiple channels for communication to the designated regional government's MAC office (one for each region), which will analyze the nature of consultations or complaints. Based on this analysis, the complaint/comment

will be channeled to the relevant ER Program’s management or project’s entity, which will implement actions to respond to the consultation. If the consultation and/or complaint are not directly relevant to the ER Program, these will be transferred to other entities with the authority to resolve them, such as the Ombudsman's Office, the Public Prosecutor's Office, and the Public Ministry, among others.

After the implementation of actions or processes, the case will be registered, closed and included for subsequent communication and reporting to the relevant entities. It should be noted that compliance times are important and that outcomes should be closely monitored in order to avoid further complaints or conflicts. The ER Program MAC will report information to the National Safeguards Information Module in order to allow national monitoring of safeguard compliance. The ER Program MAC is also linked to the national level MAC and will provide information on regional questions, consultations and complaints registered to the national MAC.

Figure 14.3.1. The Mechanism for Citizen Attention (MAC-ER Program)



Monitoring and Evaluation

The development and use of the ER Program MAC will be monitored and evaluated with regards to its objectives in order to identify measures of continuous improvement. Monitoring and evaluation of the MAC at the regional level will be performed by a regional Safeguards Committee.

Suggested indicators for the MAC are shown in Table 14.3.1., some of which will be monitored in a participatory approach. The aim is to comply with the following:

1. Participation of actors, including indigenous peoples, and the facilitation of opportunities and access for presenting opinions, suggestions or complaints.
2. Timely attention to claims, using appropriate mediation without generating subsequent conflict.

3. Transparency of access to information by stakeholders.
4. Commitment on the part of the actors in the dialogues, achievement of agreements and resolution of complaints.

This information will serve as inputs into annual reports, which will detail activities carried out, achievements, and an analysis of feedback and continuous improvement.

Table 14.3.1. Indicators and means of verification for MAC-ER Program

Variable	Means of Verification
Participation and access	Number of channels facilitating access to information and/or the presentation of inquiries or complaints. Number of agreements embodied in documents with social buy-in. Number of agreements that are effectively implemented and involve stakeholders.
Attention to complaints	Number of complaints and grievances received. Number of complaints and claims settled.
Transparency mechanisms	Number of accountability events ¹²¹ . Reports on information requests and responses.
Commitment	Report on the results/achievements of these initiatives. Feedback actions Communication with actors

Regional Capacities for the ER Program Citizen Attention Mechanism (MAC)

Consultations were held with regional stakeholders and specialists from the regional governments in order to diagnose the capacities of regional governments to respond to citizen consultations and/or complaints.

Ucayali Region.

There is no specialized office in the region to deal with citizen questions, complaints, or claims. Forestry complaints are handled by the General Directorate of Forestry and Wildlife (Dirección General Forestal y de Fauna Silvestre). General information is provided by the regional government through a public official designated for this purpose. The regional government also has channels of communication with the public, such as a website and social networks, which in accordance with the law of transparency and access to public information enables general consultations.

¹²¹ Article 199 of the National Constitution establishes that the regional governments and local governments must formulate their budget with the participation of the population, and besides once a year they should conduct a public accountability procedure about their Budget expenditure.

San Martín Region.

San Martin has made progress in implementing a platform for citizen attention for environmental complaints called the "Regional Information Service for Environmental Complaints - SIREDA" created through Regional Executive Resolution number 687-2017 GRSM-GR¹²².

The SIREDA is a virtual or face-to-face service that, through a reception desk, deals with environmental and natural resource complaints related, for example, to tourism, small-scale or artisanal mining, health services, and small-scale aquaculture or artisanal fishing.

Complaints can be registered at the regional government's website, where the user identifies the regional directorate that will take charge of the complaint. After entering the data, the regional government proceeds to analyze and, according to the characteristics of the complaint, proceeds to carry out an on-site visual inspection to collect more information. If needed, the complaint may be resolved by an administrative process or a criminal process involving the environmental prosecutor. The regional government has proposed to strengthen the SIREDA in order to be able to attend consultations, queries, and claims that could be generated during the implementation of the ER Program.

Roadmap of the ER Program MAC

Table 14.3.2. Roadmap of MAC activities

Activities	Months												2020	
	1	2	3	4	5	6	7	8	9	10	11	12		
	Mechanism for Citizen Attention Program (ER Program MAC)													
Assessment of existing national and regional FGRM.														
Design of the ER Program MAC linked to the national level.														
Consultation and participation														
Institutional arrangements														
Formulation of procedures manuals and tools for MAC implementation, monitoring and evaluation.														
Implementation of ER Program MAC for both San Martin and Ucayali														

15. BENEFIT-SHARING ARRANGEMENTS

15.1 Description of benefit-sharing arrangements

The benefit-sharing mechanism (BSM) establishes a results-based payment modality through which the financial resources obtained from the FCPF Carbon Fund for emissions reductions are distributed among the various

¹²² See section 13.7 in Annex 13, for more information about the SIREDA.

participating actors. The fundamental objective of benefit sharing is to generate incentives among different actors so that they undertake actions resulting in the reduction of deforestation, forest degradation, and forest-based emissions. It is expected that the distribution of benefits will improve the sustainability of the Program through stakeholder access to these incentives, as well as the strengthening of institutional capacities.

Key aspects of the design of the benefits distribution plan include: the identification of beneficiaries, the form of benefits, the distribution of benefits among the actors, and the criteria used in order to determine magnitude of the benefits. For this purpose, it is important to identify both the holders of enabling titles to forests and the other actors inside and outside the forests who are part of the economic, social and political processes responsible for deforestation and whose action is key to reversing it.

Within this framework, the benefit-sharing proposal is based on three basic principles:

Effectiveness: Under the PPI approach, the distribution of benefits will provide incentives to achieve GHG emission reductions based, as said in the Framework Law of Climate Change, on a paradigm shift, via an increase of economic value of forest resources and climate-friendly agrarian production (improvement in forest management, value enhancement practices, and conservation, as well as inclusive, low emissions development outside the forest).

Efficiency: Emission reductions will be achieved at the lowest possible cost, minimizing transaction and implementation costs of programs and plans and, above all, promoting results that contribute to low emissions sustainable development while simultaneously producing emissions reductions.

Equity: The distribution of benefits among the different actors linked to REDD+ emissions reductions should be equitable and consider not only the holders of the various enabling titles within forests, but also important actors outside forests, while minimizing as far as possible social and environmental trade-offs.

During regional consultation workshops local and regional stakeholders provide feedback regarding the process and design, including criteria used and channels. This feedback has been included in this version.

In addition, in the framework of forest and climate change governance, a public-private working group composed by representatives of indigenous organizations, NGOs, and subnational governments, among others, was launched in March of this year to discuss and propose the best arrangements for a financial mechanism and benefit sharing scheme. In this space the different approaches will be discussed in a multi stakeholder, multilevel and multisectoral spirit.

Benefits and beneficiaries

Benefits will usually take the form of providing incentives to stakeholders to change the pattern of land use and address to regional sustainable development. In that sense, the specific actions that would be eligible for funding must be based in a diagnosis of needs and interaction with those stakeholders. Preferably, the magnitude of benefits to each specific beneficiary will not be based on their specific direct contributions to emissions reductions, since it is quite difficult to attribute the percentage of contribution of each stakeholder to the aggregate emissions

reduction, but rather on the size of the incentives needed in order to change beneficiaries' behavior in favor of forest protection or more sustainable land use practices. Another reason to delink the emissions reduction with the magnitude of benefits is that the emissions reductions occur in forest areas but, in some cases, as a consequence of actions implemented in the agrarian frontier and thanks to public policies. Therefore, a share of benefits should also be received by those actors, as will be described below.

In the case of nested projects, as explained below, there is an on-going working roundtable to establish rules to allocate quotas to these projects. These rules will be part of the final benefit sharing proposal.

Potential beneficiaries include:

Participants with direct impact, i.e., holders of titles or rights of possession of forest resources that promote actions to increase forest conservation or avoided deforestation via the management or co-administration of national and/or regional conservation system (protected areas), forest concessions, conservation concessions, ecotourism and local forests. As stated in the Forest and Wild Life Law Regulation, the holders of enabling forest titles have the right to access forest ecosystem services retribution mechanisms.

Participants with indirect impact, i.e. actors in the agricultural sector participating in interventions under the Production-Protection-Inclusion (PPI) approach, who directly (as a condition of cession-of-use contracts) or indirectly reduce deforestation (for example, agricultural intensification reducing the need to clear new plots from forest). These participants include producers with cession-in-use contracts for agroforestry systems, reforesters, and value chain actors such buyers, processors, distributors, whose action drives low- emission development in the accounting area.

Indigenous Peoples. The program recognizes the central role of indigenous peoples in forest conservation by creating a separate beneficiary category. This category could recognize the effort of native communities related to forest conservation and local monitoring, the implementation of community development plans (*planes de vida*), and community forest management for timber or non-timber products and could include financial incentives based on a forest conservation approach (TDCs) as well as results-based benefits.

Political and administrative actors at different levels of government. These beneficiaries include the central, regional, and local governments or programs, and may even include the neighborhood councils of the district municipalities who actively implement actions addressed to reduce emissions from deforestation or forest degradation.

Eligibility criteria

Within the broad categories of beneficiaries mentioned above, the matrix of interventions described in Section 4.3 is the framework to define the eligibility. The rules regarding the specific activities/projects/plans that will be funded will be developed in the following months. In all the cases, there must be clearly documented actions (policies or field actions) that activities reduce deforestation or forest degradation, even though the specific impact on emission reductions of each activity will not be measured. In the case of indigenous peoples, the regional and national indigenous organizations will participate in the determination of eligibility criteria. In the case of producers, forest

conservation and/or sustainable agricultural intensification not occurring in recently deforested areas, must be demonstrated.

Distribution channels

The financial arrangements for benefit sharing will take into consideration the fiduciary requirements of the main results-based payment mechanisms that are being developed by Peru and that expects to channel the financial resources from sources such as the Joint Declaration of Intent (DCI), the Green Climate Fund, and other initiatives. The design must include linkages with existing pioneering financial institutions and mechanisms that are being promoted in the regions of San Martín and Ucayali, such as the Development Funds of these regions (FONDESAM), public investment projects, and the dedicated grant mechanism (MDE-Saweto), among others, which together are instruments for promoting low emission development.

Although this permanent financial mechanism is currently being designed, some guidelines have been defined. The mechanism should:

- Be based on contributions-for-deliverables, adapting over time as deliverables evolve from enabling policies to national level verified emission reductions.
- Be managed according to established international standards – including fiduciary, governance and social and environmental safeguards.
- Ensure transparency in all aspects of disbursements and operations.
- Include a coordination committee with a balanced representation of central government, regional governments, civil society (including the private sector) and indigenous peoples in the governance structure of the funding instrument.
- Undergo independent annual audits of technical and financial aspects of the fund and it's supported projects and initiatives.
- Be agreed by Partners before it is established.

The rationale for using a unique financial mechanism is that the trust entity should have sufficient capacity to meet high fiduciary standards and best financial practices, while maintaining management and transaction costs low. In this respect, the mechanism would have a competitive advantage compared to an *ad-hoc* fiduciary administration. This trust entity and its institutional structure, financial instruments, and policies and procedures for decision-making, disbursement, transparency and accountability, are being designed and will encompass key elements of fiduciary responsibility and safeguards.

Indigenous peoples

Channeling of the benefits to indigenous peoples may be based on the model of the Specific Dedicated Mechanism for Indigenous Peoples model (MDE-Saweto), an initiative led by the national indigenous organizations of the Peruvian Amazon, AIDSEP and CONAP. The MDE has general guidelines for its operation and its funds are administered by the World Bank through WWF-Peru as the executing national agency, complying with the policies of safeguards and mechanisms for the resolution of complaints and conflicts. In addition, it operates a system of accountability and an indicator-based results framework.

This experience has been largely positive and has shown how partnerships among indigenous groups, competent and independent financial administrators (WWF), and regional governments can achieve the recognition and titling of indigenous lands in a cost-effective manner. In the case of Ucayali, this experience has also stimulated the formalization of the Program for the Development of Indigenous Peoples within the regional government, whose manager is chosen in coordination with regional indigenous organizations, and whose purpose is to improve the relations between the regional government and indigenous peoples, particularly in regards to sensitive themes such as land titling and community forest management. Lessons learned during the MDE process will be incorporated in order to improve implementation procedures and policies.

Results-based benefits will finance sub-projects in indigenous peoples' communities and territories executed by accredited agencies (indigenous federations and regional organizations of San Martín and Ucayali, and their member communities). Sub-projects will be supported by proposals that comply with the requirements and technical specifications of the procedures for administering these benefits. Coordination of these project with the regional governments will be based on the regional government of Ucayali's model for the Regional Management of Indigenous Peoples, which will also be promoted in San Martín.

Small and medium producers

The channeling of the benefits to small and medium producers will make use of pre-existing mechanisms at regional and local levels (guarantee trusts, local development agencies, public-private institutional arrangements, public projects, and cooperation and private projects in execution). These benefits may include technical assistance, regularization of licenses, and facilitation of access to financial services and markets, among others. Potential beneficiaries include producers who assume the standards of the Production - Protection - Inclusion model, and/or comply with the social and environmental safeguards or criteria defined for the regional branding of San Martín and Ucayali.

Government entities

A percentage to be defined of results-based payments will be distributed to national, regional, or local governments. These payments will be used for the administration, management and monitoring of the Program, the costs of maintaining the National REDD+ architecture (MRV system, SIS, FREL update, Registry, among others), the costs of benefit sharing, as well as the implementation of public policies required to reduce deforestation. The resources received by government entities will be subject to the same transparency requirements as those received by indigenous peoples and communities and small and medium producers. At the regional level, these funds would be channeled to the fiduciary institutions of the governments of San Martín and Ucayali (FONDESAM), which have the national development bank, COFIDE, as trustee.

Benefit-sharing criteria

Payments for results under the ER Program and its consequent relationship with the benefit-sharing mechanism (BSM) are based on the difference between the volume of emissions estimated by the so-called "compensation baseline" (see box below) for the accounting area, constituted by the average emissions of San Martín and Ucayali

regions as a whole, during the 2008 - 2017 period; and the (potentially reduced) volume of emissions measured in the accounting area during 2020 – 2024.

The fact that San Martin and Ucayali are different political entities with different historical trends and levels of deforestation and forest-based emissions, raises a number of questions. One is related to the recommended course of action when emissions reductions by the regions differ with regards to the compensation baseline, one region being above and the other below their respective averages. Thanks to GEOBOSQUES, it is possible to measure how many emissions have been reduced in each jurisdiction compared with the CF reference level established for the purposes of current agreement.

A similar problem exists between specific groups of participants within each region. In this case, the same approach to allocate payments between regions should be used.

Within each potential beneficiary, such as indigenous groups, the same problem could be faced: some group members may reduce their emissions but may not receive just compensation due to lesser net reductions or a lack of reductions by other members of the group.

To deal with these complex hybrid scenarios, a working group composed by the two regional governments and the Ministry of Environment will work on a proposal to establish internal arrangements to mitigate the negative impacts of differentiated performance and not desincentivize the maintenance of successful efforts.

In the case of indigenous communities, indigenous organizations will assess the feasibility of establishing a differentiated and specific modality to share between communities the benefits that correspond to indigenous peoples participating in the Program.

Existing REDD+ projects also pose a similar problem in that their existing baselines are different (usually higher) than those of the ER Program. In this case, the long-term solution is to nest them within the ER Program and to migrate them toward using the Forest Reference Emissions Level, officially submitted to the UNFCCC by the Government of Peru. To this end, the authorization of the use of individual baselines could be extended until the eventual start of the ERPA. In parallel, a nesting proposal would be formulated that would be implemented at the signing of the ERPA. This process is presently being negotiated by MINAM and existing REDD+ projects.

In a more general approach, it must be clear that the reduction of deforestation is a consequence of multiple policies and measures carried on by a variety of local, regional and national actors. In that sense, the allocation cannot be strictly based on the relative reduction occurred in each forest pixel (and the holder of the right of this area) but must take in consideration the multidimensional nature of the phenomenon of deforestation.

Under this new vision, assistance or incentives (e.g. technical assistance, training, access to credit or markets, etc.) provided by the Program can be viewed as up-front benefits that do not depend only on emission reduction performance. It would also open the possibility of using results-based payments in areas where development needs are greatest, even though emission reductions there may be minimal.

In this context, the benefit sharing mechanism (BSM) will not use the eventual contribution of specific actors to the reduction of emissions by the ER Program as the sole distribution criterion, since it may not be feasible, or economically viable for an individual owner or even a group of owners, to attribute or demonstrate *ex ante* that they have rights to estimated reductions on a regional scale, especially when emission reductions are due to indirect effects or are diffuse across the accounting area (e.g. due to improved institutional enabling conditions). Under this scheme, resources may be geographically allocated based on criteria associated with the developmental needs of territories within the accounting area, following the interventions prioritized in Chapter 4.

It should be noted that regional governments and other stakeholders agreed with the main items of the proposal: the four potential beneficiaries; the importance that the benefits should be used to promote a “change of paradigm” (recognized in the Framework Law of Climate Change and understood as a permanent change in the economic behavior and land use dynamic) and the principles of distribution. Their main contributions to the proposals were related to the channels used to distribute resources to final beneficiaries and the need to add criteria such as transparency, requirement of assembly acts (instead of just basing distribution on the decisions of the head or president of the communities or local organizations).

Institutional arrangements

Institutional responsibilities for the benefit sharing scheme are shown below in Table 15.1.1. Six main functions for benefit sharing have been identified, requiring specific institutional arrangements for their implementation, which will be formulated in the advanced draft of the Benefit Sharing Plan.

Key aspects of the benefit-sharing scheme in need of further definition will be developed by the working group mentioned at the beginning of this section, under the coordination of MINAM (see section on road map, below).

Reporting

Periodic reports of the ER Program will include an annex on benefit-sharing in the accounting area. There will also be an independent third-party external review of benefit-sharing procedures. Even though, the specific design of this external review is not yet established, representatives of the beneficiaries will participate in the formulation of the terms of reference of the external reviewer in order to ensure and provide transparency with regards to the allocation of benefits among different regions and beneficiary groups. The trust entity will participate in this process by providing information on executed benefit-sharing transactions.

Table 15.1.1. Institutional functions and responsibilities for benefit sharing

Functions	Responsible entities
1. Monitoring emission reductions	SNMCB System, PNCB-MINAM
2. Calculation of benefit sharing between and within jurisdictions, based on results of monitoring	MINAM & benefit sharing technical working group
3. Calculation of benefit sharing process at the indigenous community level, based on criteria and indicators previously designed, consulted and published (to be included in the final draft on the benefit sharing plan).	Benefit sharing technical working group. Regional development managers of indigenous peoples of San Martin and Ucayali.

4. Calculation of benefits sharing for other groups.	Benefit sharing technical working group.
5. Benefit sharing process (transfer of resources) to other groups	Trust entity and benefit sharing technical working group.
6. Monitoring and reporting on the use of resources derived from benefit sharing, including local monitoring.	Trust entities and benefit sharing technical working group; beneficiaries and third-party verification.

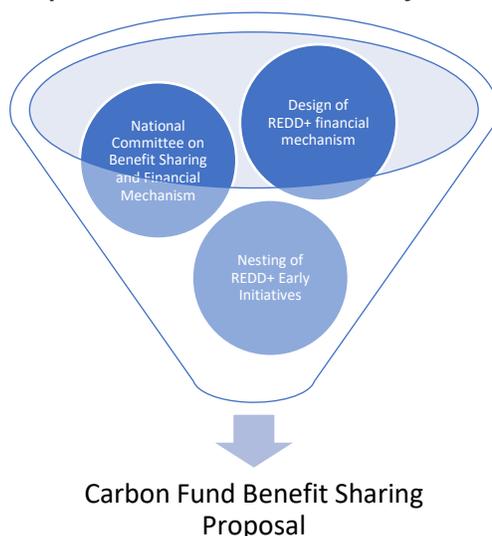
Roadmap for further development of the BSM

The ER Program proposal is being formulated within an institutional context that is in the process of definition, since MINAM and other ministries are in the process of defining institutional coordination and governance in relation to the National Forest and Climate Change Strategy. In addition, at the regional level, new regional authorities assumed office in January 2019, which, due to the lack of re-election in the country and the lack of a civil service, will entail high administrative turnover and will require a process of advocacy, appropriation, and feedback to the proposal.

In that sense, we identify following national processes that will be inputs for CF BSM definition:

- Nesting process, with REDD+ Early Initiatives: to establish a set of arrangements to ensure that the amount of reductions allocated to these initiatives will be calculated in concordance with national FREL avoiding inconsistencies in national accounting. At this time, a transitional period that allows REDD+ early initiatives to work with their own baselines until the end of 2020 is in progress (which is the year when the FREL needs to be updated).
- National Working Group of Benefit Sharing and Financial Mechanism, recently announced by Ministry of Environment and whose work will start in June with a broad participation of public and private stakeholders. A concept note has been prepared for this.
- Financial Mechanism for REDD+ RBP: based on previous proposals developed by MINAM, a proposal that incorporates the best elements of each proposal is being built for discussion with counterparts, as Norway and Germany, in order to agree an operational mechanism.

Figure 15.1.1 Inputs to the Carbon Fund benefit sharing proposal



At the national level, within the benefit distribution working group, sub-groups will be formed to deal with specific topics such as the following:

BSM and Public Entities: the operability and methodology of inter-regional benefit sharing; analysis and alternatives for hybrid scenarios; alignment of financial instruments such as the FONDESAM and the DCI financial mechanism; definition of specific regional incentive mechanisms such as those related to forest management activities; and promotion of specific technical work.

BSM and Indigenous Peoples: formulation and consensus on a proposal to articulate the ER Program with the Amazonian Indigenous REDD+ (RIA) initiative, at the level of the accounting area; supervise specific studies; and identify how the "Saweto model" of inter-institutional cooperation and financial management can be adopted and/or improved.

BSM and REDD+ Early Initiatives: definition of a plan for the nesting of REDD+ projects that recognizes the different starting points (baselines) of the initiatives and their degree of alignment with regional and national processes, including the compensation baseline of the accounting area. It should be noted that a working group, including MINAM and the current REDD+ Early Initiatives, is currently working to define guidelines on how to nest the REDD+ Early Initiatives within the official FREL. Since this process will imply allocation of some of the potential emissions of the FREL, it will include the involvement of other public and private stakeholders to build this "FREL map", which will serve as an input for nesting.

BSM and Participating Producers (inside and outside the forests), whose mandate will refer to validate "advanced" benefit-sharing models, that is, those that are more aligned with the Production-Protection-Inclusion approach. This model would include Program incentives and assistance as up-front benefits but could also include payments from the reductions of emissions (if they occur) as a co-benefit.

15.2 Summary of the process of designing the benefit-sharing arrangements

These inputs will be considered during the process of preparation of the BSM for the FCPF Carbon Fund. The following schedule has been discussed and built with regional governments and has been validated with regional stakeholders.

Stage	Participants	May	June	July	August	September
Creation of the supra-regional committee in charge to prepare the benefit sharing proposal	MINAM, GORESAM, GOREU					
Bilateral consultations with stakeholders and potential regional beneficiaries	MINAM, GORESAM, GOREU, representatives of beneficiaries					
Elaboration of benefit sharing scheme draft proposal	MINAM, GOREU, GORESAM					
Participative process consultation of draft proposal in decentralized workshops						

	MINAM, GORESAM, GOREU, regional and province stakeholders	
Revision of feedback and design of final proposal	MINAM, GOREU, GORESAM	
Approval of final proposal in MINAM and regional governments	MINAM, GOREU, GORESAM	

Step 1. Create a supra-regional working group, integrated by MINAM, GOREU and GORESAM with the mission to conduct the process of definition of a BSM **[May 2019]**

MINAM has sent official letters to both regional governments requesting the designation of official representatives for different aspects related to this proposal, including the preparation of a benefit sharing proposals. Both regions have already answered, designating a member and an alternate member. The designations, signed by the governors, are high-level personnel: the head of the Economic Development Directorate in the case of Ucayali and the Regional Environmental Authority (ARA) in the case of San Martin.

A first meeting with the recently designated delegates were carried out (separately with each) in May and the schedule above was agreed upon with them.

Step 2. Organize bilateral meetings with regional stakeholders for initial feedback **[June 2019]**

As recommended during the meeting with civil society, as an input for preparing the first public draft of the BSM, the working group will organize and carry out bilateral meetings with key regional stakeholders, including producers' grassroots organizations, indigenous people organizations, private sector organizations (chambers or others), public entities, non-profit organizations, REDD+ Early Initiatives, among others in order to consult them regarding their expectations in terms of deforestation threats, mitigation measures, eligible actions, distribution channels, among other aspects. This is a key feedback to ensure that the next draft version will only receive minor comments that can be rapidly resolved. The working group will adjust the structure of the BSM proposal and, based on that, will prepare a list of items to be consulted during bilateral meetings.

Step 3. Prepare the first draft of the Benefit Sharing Mechanism for the FCPF Carbon Fund **[July 2019]**

With the feedback of previous bilateral meetings, the working group will prepare the first public draft of the BSM proposal for open discussion with key stakeholders, including representative organizations of potential beneficiaries. The structure of the proposal, under revision, is detailed below.

Step 4. Participatory process for discussion on BSM proposal **[August 2019]**

The draft proposal will be available for public comments during a month and simultaneously, participatory decentralized meetings led by MINAM with the respective regional government will be carried out with key stakeholders, including indigenous people, agriculture and forest producers, the private sector, civil society, governmental entities (municipalities, environmental attorney), among others. The comments will be systematized by actor with the purpose of analyzing and preparing specific responses to each.

Step 5. Review of comments and prepare the final BSM proposal **[September 2019]**

Based on the matrix of comments and the proposed structure, the working group will analyze the comments received and will make, if necessary, adjustments to the draft proposal, incorporating appropriate improvements. Together with the final proposal, the matrix of comments will also be available

for public review.

Step 6. Approval of final proposal of BSM [September 2019]

After concluding the design of the final proposal, both regional governments and MINAM will start the internal process of formal approval according to the current procedures and legal framework of each entity. The final version of the BSM proposal will be included in the final version of ERPD. The working group will act as focal point for comments that this proposal could receive from the Carbon Fund Participant Committee.

As mentioned before, a draft structure has been discussed with regional governments and other key regional stakeholders. This must not be considered a close index but will be the basis for starting the organization of the proposal. This structure is detailed as follows:

DRAFT STRUCTURE OF BSM

1. Institutional Arrangements
 - a. Administrative Entity: This section will define the entity (or entities) that will administer the resources that may come from Carbon Fund results-based payments. The entity should meet the requirements for administering this type of funds and should be appropriate and accessible for potential users.
 - b. Governance Body: In this section, a technical-political unit will be in charged with formalizing the guidelines for the use of funds, adjustments to the BSM design and leading the approval of funding of activities.
 - c. Relation with FGRM: The institutional arrangements will include a mechanism through which the beneficiaries and citizens may expose claims and questions regarding the application of BSM.
2. Legal Framework
 - a. For fund reception: This section establishes the legal basis that authorize the administrative entity to receive funds.
 - b. For fund transfer: This section establishes the legal basis that authorizes the administrative entity to transfer the resources to the final beneficiaries, including the way these transfers occur.
3. Beneficiaries: This will be a list, according to Peruvian legal categories, of eligible natural or legal persons that can apply for funding, indicating. The exclusion of certain stakeholders may also be mentioned.
4. Funding
 - a. Eligible activities and lines: a list of the types of projects and types of costs that are eligible for funding, indicating how this will be verified and the party responsible.
 - b. Procedures to apply: An operational handbook, explaining the steps that any potential applicant must follow to apply for funding. Benefit-sharing calculation method
5. Benefit Sharing calculation method:
 - a. Between jurisdiction BS calculation formula: The description of the mathematical method used to to determine how, for the amount of benefits for a given year, benefits will be allocated between San Martin and Ucayali, and the sources of data for the variables that compose this formulae.
 - b. BS calculation formula for the types of beneficiaries within each jurisdiction: The description of the mathematical method used to to determine how, for a given year and region, benefits will be allocated between the four types of beneficiaries, and the sources of data for the variables that

compose this formula.

- c. BS calculation formula within each type of beneficiary: The description of the mathematical method used to determine how, for a given year and the type of beneficiaries in each region, benefits will be allocated between the different members of a given type of beneficiary, and the sources of data for the variables that compose this formula.
 - d. Linkage with REDD+ Early Initiative: A description how the benefit sharing mechanism will take in consideration the decisions resulting from the nesting process dialogue regarding the REDD+ Early Initiatives in Ucayali and San Martin.
 - e. Internal arrangements in hybrid scenarios: A description of the provisions to reduce the impact of emissions greater than the historical average, associated with a specific type of beneficiary or jurisdiction, on the positive performances of the other types of beneficiaries or jurisdiction. The purpose of these provisions is to avoid that hybrid scenarios desincentivize positive performances of some actors.
6. Third-party audits: A description of third party audits, including a description of the selection process, the issues that will be audited, including financial management and technical execution, at the administrative and field levels, among others. An assessment of the effectiveness and impact of the BS program may also be part of its functions. The chronogram of the audits should also be determined, considering impacts may be measured from a long-term or mid-term perspective.

The prototype design of the BSM is the result of reflection and synthesis of the many discussions and consultations with a wide variety of stakeholders held on REDD+ since 2013, including the REDD+ Readiness process, that are mentioned in section 5. In general, the participation of various actors in the ER Program, as extensively detailed in the aforementioned section 5, is provided for in the country's legal and institutional framework at the different levels of government (national, regional and local) and is guided by the Plan for Stakeholder Participation and Engagement (PPIA) and the Plan for the Participation of Actors in the ER Program that are being developed by MINAM.

This process has paid particular attention to the participation of indigenous peoples, in accordance with national (Law No. 29785) and international standards (ILO Convention No. 169). Likewise, the participation and consultation of indigenous peoples is included in the Amazonian Indigenous REDD+ Program (RIA), and the Prior Consultation Law provides additional guarantees specifically focused on these groups. Indigenous peoples will also be represented in the working group on emissions management of the forest and climate change governance, in progress. The technical *ad hoc* working group charged with resolving remaining technical issues related to benefit sharing also includes a sub-group dedicated to benefit sharing by indigenous peoples.

In addition, the Benefit Sharing Mechanism is collecting lessons and experience from the Dedicated Grant Mechanism for Indigenous Peoples - DGM Saweto. This initiative of the Forest Investment Program (FIP), financed by the World Bank, is aimed at resolving essential problems related to Amazon indigenous governance. In particular, it uses and supports the implementation of community development (*planes de vida*) plans as a benefit-sharing mechanism, which in turn incorporates safeguard standards and policies, a grievance mechanism, measures to reduce conflict of interest and increase accountability, and the use of goal-based indicators.

The benefit sharing proposal will serve as a solid conceptual base for further consultation with stakeholders. The

roadmap for these consultations contemplates consultations with regional stakeholders in the first semester of 2019. This process will coincide with the transition period of the new regional governments and will help empower the new administrations in promoting the implementation of the ER Program.

Multi-regional (San Martin and Ucayali) consultation workshops were held in March and May 2019 and include the following participants:

- The Regional Governments of San Martin and Ucayali, including agrarian, forest, production and other regional directorates.
- Public and private actors, with emphasis on the active participation of women and youth.
- Indigenous organizations from both regions, from AIDSESP and CONAP, MINAM, MINAGRI, MINCUL.
- Producer organization representatives from the coffee, cocoa, palm oil, cattle ranching and other predominant crop sectors with presence in those both regions; also timber organizations and NGOs that promote conservation activities in Protected Areas.

In all cases, especially in the case of indigenous people, the consultation process will incorporate an intercultural approach.

15.3 Description of the legal context of the benefit-sharing arrangements

Sections 4.4 and 4.5 describe in detail the Peruvian legal framework for land tenure and property rights. Within this context, laws that are relevant for the benefit-sharing plan include the Forestry and Wildlife Law, the Law for the Mechanism for the Compensation of Ecosystem Services (MERESE), the Law of Agrarian Development of Indigenous Communities and Low and High Jungle, and the Framework Law on Climate Change.

With regard to forests, the Forestry and Wildlife Law establishes that lands suitable for forestry, with or without forest cover, are the property of the State. Individuals may have access to forest exploitation through forest concessions, while indigenous populations have the right to their exploitation but not to the ownership of such lands (except for lands for agricultural use). According to this Law, harvesting rights within permanent production forests may be granted to individuals, through concessions, which may be for timber, ecotourism, conservation, non-timber forest products, wildlife management areas, and forest plantations. Concession grant rights to use the resources but does not grant ownership over the lands or the forest settled on those lands, which belong to the State.

The Law of Agrarian Development of Indigenous Communities and Low and High Jungle recognizes the existence of indigenous communities, as well as their organization and rights, particularly over their territories, including the right to ownership of land for agricultural and livestock use, and the right to cession of use of forest areas.

More recently, the country approved the Framework Law on Climate Change, which establishes general provisions for the coordination, design, implementation, monitoring, evaluation and dissemination of public policies for the integrated, participatory and transparent management of climate change adaptation and mitigation measures. This law, the regulation of which is in the drafting process, incorporates climate change into development planning at all three levels of government.

With regards to forest governance, regional governments are empowered to control the area of forest and to grant rights of access to forest resources through forest concessions. It also recognizes the right of regional governments to grant clear title deeds to rural properties, including those of indigenous and peasant communities. At the province level, municipalities are empowered to promote sustainable management of natural resources, soil, water, flora, fauna and biodiversity.

The Law of the Mechanisms for the Compensation of Ecosystem Services (No. 30215) promotes, regulates and supervises compensation mechanisms for ecosystem services. Compensation is based on the conservation, recovery, and sustainable use of ecosystems and their services, including carbon sequestration, by landowners and those with licenses for the use of renewable resources. It creates the possibility of benefiting from Voluntary Emission Reduction (VER) certificates, although this still requires a more precise regulation (see Section 17).

The regulation of this Law defines aspects related to the design and implementation of the Contribution Mechanism for Environmental Services (MERESE) based on voluntary agreements for the conservation, recovery and sustainable use of ecosystems in order to ensure their permanence (Art. 1). This rule is applicable to natural or legal persons, public or private, that promote, design or implement ecosystem services (Art. 2). It also defines the schemes, tools, instruments and incentives to generate, channel, transfer and invest economic, financial and non-financial resources between contributors and purchasers of ecosystem service (Art.5). Contributors are defined as those who contribute to the conservation, recovery and sustainable use of the sources of ecosystem services through technically viable actions, while purchasers are those who, obtaining an economic, social or environmental benefit, compensate the contributor for the ecosystem service (Art. 7).

The regulation establishes that contributors must generate, maintain or improve ecosystem services that are compatible with the ecosystem in which they are implemented and that these actions must be aligned with the environmental planning and management instruments that are applied in their execution. Compensation constitutes economic recognition of these actions and is conditioned upon their performance (Art. 8); it is determined by the economic value of the ecosystem services, the costs of the actions, or other criteria defined by the parties; it may take the form of financing of specific actions or the financing of productive development actions or sustainable infrastructure, or other modalities. (Art. 9).

Contributors and purchasers of ecosystem services are linked through a voluntary agreement that establishes the location of the ecosystem where actions are implemented; the type of ecosystem service; the specific actions that the contributor commits to implement; the type of economic recognition used; the financing strategy; and monitoring actions (Art.10).

The governance of this system is implemented by the Good Governance Platform of the Mechanisms of Compensation for Ecosystem Services, which is structured as a space for dialogue and public-private consultation, with the purpose of monitoring compliance with the agreements and supervising the transparency of the compensation. Compensation agreements are registered in the Registry of Compensation for Ecosystem Services, after evaluation and approval by MINAM (Art. 16). One of the benefits of this registration is the accreditation by MINAM that the agreement complies with the conservation, recovery and/or sustainable use of the sources of ecosystem services (Art. 23). Likewise, MINAM is responsible for the MRV of the actions contained in the agreements registered in the Registry of Compensation for Ecosystem Services (Art. 25).

Regional and local governments can promote and facilitate the implementation of ecosystem services compensation mechanisms, either as contributors or purchasers, and can participate in Platform of Good Governance (Art. 13).

With respect to the ecosystem services of forest carbon sequestration and storage, the regulations define them as *"those that are designed and implemented in forests, forest lands, wetlands and other wild vegetation ecosystems, and that effectively or potentially reduce emissions as a result of actions that reduce deforestation and forest degradation, conserve and increase forest reserves, and sustainably manage forests, among others"* (Art. 31). In this sense, REDD+ initiatives and projects are considered mechanisms for forest carbon sequestration and storage as long as they are registered in the Registry of Compensation for Ecosystem Services and comply with specific guidelines for emission reduction approved by the MINAM. It also establishes that forest carbon sequestration and storage mechanisms that effectively reduce emissions should be incorporated in national emission reduction reports, inventories and other similar reports (Art.31.3).

As the legal framework analyzed here establishes that the holder of forest rights has the right to access benefits derived from the environmental services created within their forest area, as stated in the Forestry and Wildlife Law and its regulation, the BSM must take in consideration this legal framework in defining how other non-forest potential beneficiaries that impact deforestation can access these benefits. This is one of the pending tasks of the roadmap.

Finally, the regulation establishes that MINAM is responsible for development of the regulations and other instruments such as guides, guidelines or other complementary technical provisions that allow the implementation and effective application of the regulation.

Based on this whole analysis, the benefit sharing proposal complies with these regulations in the sense that:

- MINAM has the legal role to establish the rules on how the rights to access to benefits from environmental services may be exercised. It implies that, as is applied for other natural resources, MINAM can establish a fee of this benefits that may be reserved for public services that are supplied by administrative entities (**Political and administrative actors at different levels of government**). A pending issue that will be solved during the preparation of BSM proposal is the method to estimate / allocate the impact of public policies in terms of emissions reductions.
- It is clear that holders with rights to forest areas, including indigenous communities, have the right to access to benefits, if they meet the specific regulation that MINAM will pose (**Participants with direct impacts and indigenous people**).
- Finally, in the case of **participants with indirect impact**, even though they are not forest holders, their activity may have a significant impact on forest emissions and in that sense they should receive part of the incentives to implement environmentally friendly agricultural practices. As a result, the BSM should include, as part of the portion of the benefits received by public entities, this type of incentive.

16. NON-CARBON BENEFITS

16.1 Outline of potential Non-Carbon Benefits and identification of Priority Non-Carbon Benefits

The Emissions Reduction Program has the potential to produce multiple benefits related to increased and sustainable production, improved rural livelihoods, employment, more effective organizations, the mitigation of climate change, increased climate resilience of human populations, the protection and recuperation of watersheds, and the conservation of biodiversity.

Within this context, MINAM has identified non-carbon benefits via meetings with experts and multi-stakeholder workshops organized by MINAM during 2018 (Table 16.1).

Table 16.1. Priority non-carbon benefits identified.

Non carbon benefits	Mitigation Measures					
	MFC	MFS	Conservn. indigenous communities	ANPs	Reforestation	Agroforestry
Environmental						
Biodiversity conservation	X	X	X	X		X
Water quality and regulation	X	X	X	X	X	X
Soil protection	X		X		X	X
Wildlife refuges	X		X	X	X	
Ecosystem services				X		
Climate regulation					X	
Social						
Quality of life of producers and their families	X	X	X	X	X	X
Community participation and strengthening	X	X	X	X	X	
Promotes participation of women in economic activities	X		X		X	
Respects the world vision and cultural of the community	X		X			
Avoids out-migration	X		X		X	
Strengthened governance, reduced conflicts, reduced pressure on forests	X		X	X	X	X
Capacities of participants				X		X
Economic						
Increased employment	X	X	X		X	X
Increased income	X	X	X	X	X	X
Income diversification			X	X	X	X
Increased productivity		X			X	
Reduced informality	X			X		
Overcomes financial barriers	X		X			
Reduced climatic vulnerability				X	X	X

Based on this list, three priority non-carbon benefits were chosen due to their overall importance, direct relationship with ER Program activities, the ease and cost of their monitoring, and their representativeness of environmental, institutional, and socioeconomic impacts and the overall “health” of these sectors. Monitoring of

the other non-carbon benefits listed in Table 16.1 is not contemplated due to reasons of cost. These non-carbon benefits include: habitat conservation/fragmentation and connectivity (environmental), institutional coordination (institutional), and job creation in green industries (socioeconomic). Further consultation with stakeholder regarding the validation of these co-benefits will be carried out during 2019 in the context of the continuing validation of the ER Program and the development of local monitoring systems.

These non-carbon benefits are supported by Peru's legal and institutional framework. Habitat conservation and connectivity is an objective of the System of Natural Protected Areas, under the Law of Protected Natural Areas No. 26834. It is also supported by the Law for the Sustainable Use of Natural Resources (Law No. 26821); the Forestry and Wildlife law No. 29763; the National Environmental Action Plan which emphasizes the prevention, protection and recovery of the environment and its components and the conservation of natural resources; the Law of Conservation and Sustainable Use of Biological Diversity No. 26839, which deals with the conservation of biological diversity and the sustainable use of its components, and promotes the conservation of ecosystem biodiversity; and the Ecosystem Services Compensation Mechanisms Act No. 30215 which promotes, regulates and supervises ecosystem services derived from voluntary agreements that establish conservation, recovery and sustainable use actions to ensure the permanence of ecosystems.

Habitat connectivity and fragmentation has been used by a number of countries as an environmental indicator since it is related to biodiversity and forest conservation and contributes to other environmental or social attributes or co-benefits such as water quality, soil protection, wildlife refuges, ecosystem services, quality of life, and resilience to climate change. Moreover, the subject of habitat conservation and its loss has been raised by local stakeholders during the consultation workshops, due to their concern regarding the reduction of useful species important for subsistence and their habitats. This indicator will be impacted positively by the majority of the interventions of the Program, most importantly intervention 1.2 (forest governance in indigenous communities), 1.3 (conservation in ANPs), 1.4 (MFC), 1.5 (MFS), 2.2 (intensification of commercial agroforestry systems), 2.3 (Strengthen familiar agriculture from a subsistence level to a level that generate surplus for market), 2.4 (commercial reforestation), and indirectly by 3.1 (investment and off-farm employment creation), and 4.3 (monitor, control, and enforcement of land and forest use).

Increased off-farm employment in green businesses, created by the investment and employment promotion strategic line of the Program, is specifically included in the ER Program as a mechanism to reduce pressure on forests by absorbing migrants and marginal farmers. Off-farm employment is expected to be increased by interventions 3.1 (promotion of investment and off-farm employment creation by green businesses), 1.5 (management of riverine forests), 2.4 (commercial reforestation by business-community associations), and the strengthening of agencies for the promotion of investments and low emissions development such as the OPIPs of the regional governments, the Public-Private Coalition, the ARDs, and ALD. Increased off-farm employment will also likely impact or be related to other important economic and social co-benefits such as income and income diversity, quality of life, increased participation of women in productive activities, the avoidance of out-migration, reduced informality, and increased productivity. It also forms part of the regional government strategy and policies for low emissions economic development under the PPI approach.

Institutional coordination is a transversal process within the ER Program and is directly addressed through intervention 4.1 of Strategic Line #4, as well as the governance mechanisms and structure mentioned in section

6.1 Currently, a number of entities (e.g. the MIC and the Forest and Climate Change Commission of MINAM/MINAGRI) are addressing problems of institutional coordination and alignment at the national and regional levels and these results and recommendations will be incorporated in the governance of the ER Program. Furthermore, the Program will improve inter-institutional coordination via the Amazon Commonwealth, the ARDs, the ADLs, the Public-Private Coalition, and local entities. These improvements are expected to enable the achievement of the emission reduction goals of the other Strategic Lines and interventions.

16.2 Approach for providing information on priority non-carbon benefits

Habitat fragmentation and connectivity will be measured annually using the methodologies, based on the interpretation of satellite imagery, used to estimate forest degradation (see section 8). This methodology will generate information on habitat fragmentation and connectivity (especially patch size, patch isolation, and the area of edges and will enable the construction of an index of habitat fragmentation based on a combination of size, shape, and edge area of forest fragments, and connectivity (degree of isolation of the habitat fragments, based on criteria similar to those described in section 8). These estimations will be validated and related to local processes and actors causing deforestation, forest degradation, or forest enhancement via the use of local monitors. The results will enable a more profound understanding of the processes and actors involved in forest dynamics and the impacts of the Program interventions on these dynamics.

With regards to the creation of off-farm employment in green businesses as a result of promotion by the Program, annual estimates of off-farm employment associated with agricultural or forestry businesses will be based primarily on data provided by the regional government OIPs and the Public Private Coalition. Program management will coordinate with these entities in order to design methodologies for capturing data on both formal and informal employment created by new investments, and employment of women or indigenous people.

Improved institutional coordination can occur among sectors and between different levels of government. Indicators of improved institutional coordination are policy decisions related to the ER Program and the accounting area that are made by two or more sectors and or levels of government and which involve significant and concrete cooperation during their implementation. Illustrative examples include the inclusion of environmental considerations or compensations related to road construction (cooperation between the Ministries of Transport and Environment and the regional governments), further cooperation between MINAM and MINAGRI regarding reforestation incentives (inter-sectorial cooperation), an agreement between MEF and MINAM to include environmental criteria in the evaluation of PIPs (intersectoral cooperation affecting regional and local governments), or alignment of policies between the San Martin and Ucayali governments regarding oil palm expansion (inter-governmental cooperation).

MINAM will have overall responsibility for the gathering, systematization, analysis of data, and reporting related to these non-carbon benefits. Sources of data include the PNCB/GeoBosques Program for habitat fragmentation and connectivity, the regional government OIPs and the Public-Private Coalition for off-farm employment creation, and the Coordination Group (regional governments + MINAM, see section 6.1) for inter-institutional cooperation.

Local communities will be involved in the monitoring and verification of habitat fragmentation and connectivity, especially in the identification of on-the-ground processes and actors involved. In order to carry out these tasks, community monitors will be trained in satellite map interpretation, use of GPS, habitat monitoring, data collection and recording, and communication technologies.

Further determination of the institutional responsibilities, monitoring and reporting procedures, costs, and equipment and training needs will be carried out during the second semester of 2019.

17. TITLE TO EMISSION REDUCTIONS

17.1 Authorization of the ER Program

Name of entity	Ministry of Environment (MINAM)
Main contact person	Lucia Ruiz Ostoic
Title	Minister of Environment
Address	
Telephone	
Email	
Website	
Reference to the decree, law or other type of decision that identified this entity as the National Authority on REDD+ that can approve ER Programs	<ul style="list-style-type: none"> • Law on Creation, Organization and Functions of the Ministry of Environment, Legislative Decree No. 1013, as amended by Legislative Decree No. 1039 (article 11); • Framework Law on Climate Change, No. 30754 (articles 5 and 6); • Law on Mechanisms for the Compensation of Ecosystem Services, No. 30215 (art.12); • Regulation of the Law on Mechanisms for the Compensation of Ecosystem Services, Supreme Decree No. 009-2016-MINAM (art. 4).

17.2 Transfer of Title to ERs

Rights to emissions reductions in Peru's legal framework

The National Constitution establishes that all natural resources are heritage of the nation and this mandate has been elaborated in subsequent legislation. With respect to forests, this is reiterated in the Forestry and Wildlife Law¹²³, which states that "The nation's forest and wildlife heritage is made up of, among others: a) Forest and other wild vegetation ecosystems; b) Forest and wildlife resources maintained at their source; ... f) Forest ecosystem services and other wild vegetation systems. The same law defines forest ecosystem services, other wild vegetation ecosystems and wildlife as: "those derived from the ecological and evolutionary functions of those ecosystems and from the flows of matter, energy and information from the

¹²³ It should be noted that the Forestry and Wildlife Law and the Mechanisms for Compensation for Ecosystem Services were passed before the adoption of the 2015 Paris Agreement. Given the rapid evolution of ecosystem services concepts at the international level, both laws have been overtaken by subsequent conceptual developments in this area.

Nation's forest and wildlife heritage that produce benefits and increase well-being for individuals and society" (article 7).

Following the logic of the Forestry and Wildlife Law, the main enabling title it provides is that of forest concessions, by which the State grants in areas of public domain, the right to use forest resources, as well as (among others) "the right to benefits from ecosystem services arising from their management" (article 51). Specifying the limits of the forest concessions, the following article of the Law recognizes forest concessionaires as "holders of the rights to provide ecosystem services" but add "within the framework of the specific regulations on the matter" (article 52). This implies that the State must develop the specific regulation on ecosystem services to allow holders to exercise this right to the benefits.

The Law on Mechanisms of Retribution for Ecosystem Services (MRES) was approved in 2016. In addition to defining ecosystem services ("those direct and indirect economic, social and environmental benefits that people obtain from the good functioning of ecosystems, such as water regulation in basins, maintenance of biodiversity, forest carbon sequestration and storage" among others) and reiterating that they constitute part of the national heritage (article 3, paragraph b), the Law created the Registry of Mechanisms for the Retribution for Ecosystem Services. This Registry, which is managed by MINAM, has the purpose of "validating the mechanisms of retribution for ecosystem services, as well as their respective regulation and supervision" (article 9, numeral 9.1).

The Law states that contributors to ecosystem services include:

- i. The owners, possessors or holders of other forms of land use, with respect to the sources of ecosystem services found on these.
- ii. Those with licenses granted by the State for the sustainable use of renewable natural resources that meet the purposes for which they were granted.
- iii. The holders of contracts for the administration of protected natural areas and other mechanisms defined by the National Service of Natural Areas Protected by the State (SERNANP), with respect to the sources of ecosystem services found in them.
- iv. Others recognized by the Ministry of Environment.

More specifically, the Regulation of the Mechanisms for the Retribution of Ecosystem Services Act refers to mechanisms for the compensation of forest carbon sequestration and storage ecosystem services as "those that are designed and implemented in forests, forest lands, wetlands and other wild vegetation ecosystems, and that effectively or potentially reduce emissions as a result of actions that reduce deforestation and forest degradation, conserve and increase forest carbon stocks, and sustainably manage forests, among others" (article 31). Furthermore, it is established that REDD's initiatives, CDM-Forestry and other similar initiatives are considered as mechanisms for the compensation of forest carbon sequestration and storage and must be registered in the Registry of MRES (Article 31.2).

This Law also specifies that MINAM is the governing entity of the environmental sector that includes ecosystem services (article 4, numeral 4.1). In the exercise of this steering role, MINAM designs, regulates and promotes "policies, regulations and procedures for the development and implementation of MRES". The Regulation based on this Law established a Sole Registry of Mechanisms for Compensation for Ecosystem Services and its rules, and develops and defines two such mechanisms, the water regulation MRSE and the

carbon sequestration and storage MRES. It should be noted that after defining the latter, the Law states that "MRES for carbon sequestration and storage must comply with national rules, methodologies, guidelines and procedures, as well as those established under the UNFCCC and other similar ones, as appropriate". The registration of emission reductions by this Registry may enable the constitution of Emission Reduction Rights, authorize their eventual transfer by holders of registrants, public or private entities.

The Framework Law on Climate Change, approved in April 2018 and pending regulation recognizes MINAM as "the national authority on climate change. As the national technical and regulatory authority on climate change within the framework of its competencies, it monitors and evaluates the implementation of comprehensive climate change management at the three levels of government..." (article 5, numeral 5.1). The following article develops MINAM's responsibilities, which include coordinating, articulating, directing, designing, implementing, monitoring, evaluating and redesigning national public policies on climate change, which are related to its sectorial competencies, as well as the Nationally Determined Contributions (to greenhouse gas emissions), in accordance with the international commitments assumed by the State before the United Nations Framework Convention on Climate Change".

Article 17 of this law mentions reducing emissions from deforestation and forest degradation through the promotion of the conservation and increase of forest carbon stocks by programs and projects for the conservation and sustainable management of forests, whose beneficiaries are preferably local communities and indigenous or native peoples living in and around those forests (paragraph 17.2). It adds that the Ministry of Environment is responsible for monitoring and evaluating the reduction of emissions from deforestation and forest degradation, and reporting on its implementation to the Secretariat of the United Nations Framework Convention on Climate Change.

In summary, these Laws suggest that the forest ecosystem services, including those of carbon, are part of the national patrimony but the forest holders have the right to access to the benefits. Since the ecosystem services are the heritage of the nation, the State can not only regulate and register them, but can also determine the participation of individuals in the benefits that they bring by their actions for the maintenance of such services by handing them over the forest holders.

With regard to carbon emission reductions (i.e. carbon sequestration and storage), MINAM is responsible for supervising, promoting, and regulating their compensation and for developing and defining the rules of a compensation of ecosystem services registry. Registration in the National Registry of Mitigation Initiatives (RNIM) would confer Emission Reduction Rights which could enable their eventual transfer by holders of REDD+ projects and others (Article 55.2 of the regulations draft to Climate Change Act). However, the process of transferring these rights is not completely defined.

As a governing entity in environmental matters, climate change and ecosystem services, the Ministry of Environment has the normative basis necessary for the express formalization of the power to transfer emission reduction. In addition to references to the national constitutional framework, we may add the provisions of the following regulations:

Environment General Law

Article 94.- of Environmental Services

94.1 Natural resources and other environment components fulfill functions that allow the conditions of the ecosystems and the environment to be maintained, generating benefits that are used without any retribution or compensation so the State sets mechanisms to valorize to support and maintain the provision of such environmental services, trying to ensure the conservation of ecosystems, biological diversity and other natural resources.

94.2 It is understood for environmental services, the protection of water resource, the protection of biodiversity, the mitigation of greenhouse gas emissions and scenic beauty, among others.

Framework Law on climate change – Law No. 30754

Article 23. FINANCING

23.1 Public or private institutions of different nature accredited to climate funds might be receivers and managers of public or private contributions intended for the implementation of mitigation measures and adaptation to climate change.

Final supplementary provisions

Fourth. Emission Reduction Units

The Ministry of Environment manages, records and accounts the emission reduction units and greenhouse gas removals, in order to ensure the compliance of determined contributions at the national level, in terms of the Paris agreement.

Retribution mechanisms Law for ecosystem services - Law No. 30215

Article 7. Methods for the retribution mechanisms

7.3 Methods for the remuneration mechanisms for ecosystem services that decide to adopt contributors and payers for the ecosystem service are evaluated and approved by the Ministry of Environment.

Article 10. Guidelines and procedure for validation and registry of proposals for mechanisms for the retribution for ecosystem services

10.1 The Ministry of Environment approves the guidelines and procedure for validation and registry of mechanisms for the retribution for ecosystem services, in coordination with the competent public authorities. In this procedure, the environmental sector guarantees that the territoriality and right to the prior consultation of indigenous peoples is respected, where applicable.

All the previous dispositions establish that natural resources are the national heritage and in practice assign to the State the responsibility of regulating the sustainable use in order to benefit the general population, through the promotion, development, implementation and evaluation of appropriate public policies. In that sense, emissions reductions are not directly related to the type of property or form of permission that pertains to natural resources or land, but to the actions or abstentions needed for the generation, maintenance or improvement of the ecosystem service, which are carried out both by public and private actions. Under this approach, the importance of the public policies that the State may develop in favor of the ecosystem services is clear.

Even when private property is recognized, the State holds the right to establish rules on the use of the property. As such it regulates the use and utilization of forests by using management instruments to avoid carbon emissions or keep them sequestered at their source. Those policy instruments may take different forms to achieve the goals and objectives assumed in international commitments. In this scenario, it is important to design benefit distribution mechanisms with those who have carried out the activities intended to reduce emissions within the framework of established public management instruments. As shown in the following section, normative provisions exist that establish the power to transfer emission reductions as well as the signing of the ERPA.

Title transfer

In spite of their importance and the repeated mention of compensation mechanisms for carbon sequestration and storage, it should be noted that no regulations have been developed in the country that expressly regulate the nature of titles that represent emission reductions resulting from REDD+ projects.

Thus, in order to consolidate this interpretation, legal regulations that consolidates the competencies of the National Registry of Mitigation Initiatives (RNIM) and the transfer of titles from rights holders to MINAM are needed.

With regards to the power of MINAM to sign the ERPA "*on behalf of the Peruvian State*", there are no specific rules or regulations to such effect. Article 2, paragraph 2.2, of the Law on the Creation, Organization and Functions of the Ministry of Environment (Legislative Decree No. 1013) recognizes MINAM as "a legal entity under public law and constitutes a budgetary document". However, article 6(c) of the Law (which recognizes as one of MINAM's functions "To promote and sign inter-institutional collaboration agreements at the national and international levels in accordance with the law") and Article 7(j), which recognizes that MINAM can "implement international environmental agreements and preside over the respective national commissions" do not constitute an authorization for MINAM to sign this kind of agreement with the FCPF. In this case, further enabling regulations are needed.

The signing of international agreements is a function of the Ministry of Foreign Affairs. According to the Law on Organization and Functions of the Ministry of Foreign Affairs, No. 29357, the Ministry of Foreign Affairs has among its governing functions "Negotiating and signing treaties and other international instruments, as well as participating in the negotiations of those of a specialized nature in coordination with the competent sectors" (article 5, paragraph 6). In addition, its specific functions include "Contribute to the execution and compliance with the treaties and other international instruments to which Peru is and is a party", as well as "Represent the State and participate in international negotiations within the scope of its competence" (article 6, paragraphs 12 and 18, respectively).

The previous provisions establish the legal ability for the subscription of national or international agreements or instruments of a general nature, but they did not consider the rapid international processes and actors existing regarding climate change. To address such situation, the development of specific legislation that allows the subscription of the ERPA while respecting the constitutional framework is needed. In addition to the abovementioned articles 6 (C) and 7 (J) of the Law on the creation, organization and functions of the Ministry of Environment (Legislative Decree No. 1013), the following normative structure establishes this base:

Environment General Law

Article 94-. of Environmental Services

94.1 *Natural resources and other environment components fulfill functions that allow the conditions of the ecosystems and the environment to be maintained, generating benefits that are used without any retribution or compensation so the State sets mechanisms to valorize to support and maintain the provision of such environmental services, trying to ensure the conservation of ecosystems, biological diversity and other natural resources.*

94.2 *It is understood for environmental services, the protection of water resource, the protection of biodiversity, the mitigation of greenhouse gas emissions and scenic beauty, among others*

Framework Law on climate change – Law No. 30754

Article 5. Competent Authorities

5.1 *The Ministry of Environment is the national authority in the matters of climate change and the technical-normative authority at the national level in such matter in the framework of its competences; monitor and assess the implementation of comprehensive climate change management at the three levels of government, promoting the participation of the public sector, of the economic agents and civil society, in order to strengthen the integral management of climate change and sustainable development in harmony with nature.*

Article 6. National Authority

The Ministry of Environment is responsible for:

6.1 *To coordinate, to articulate, to manage, to design, to implement, to monitor, to assess and to redesign public policies with a national scope in the matter of climate change that relate with their sectoral competences, as well as contributions determined at the national level, in accordance with the assumed international commitments for the State before the framework convention of the United Nations on climate change.*

The Law on Mechanisms of Retribution for ecosystem services – Law No. 30215

Article 12. Ministry of Environment Functions

In framework of this law, they are functions of the Ministry of Environment:

A) *To exercise the rectory of the environmental sector that includes ecosystem services.*

As observed, the Ministry of Environment, in addition to having the rectory of the environmental sector in a general way, has also been assigned in a specific form the rectory in climate change and ecosystem services.

Using the specific character of the environmental matter, we have projected the development of a normative proposal that explicitly powers the Ministry of Environment the subscription of international instruments as the ERPA, as well as the power to transfer emission reduction. The following is the intended timetable for it:

Activities for approval of a regulation that requires the power to transfer and sign the ERPA	June 2019	July 2019	August 2019	September 2019	October 2019	November 2019
Technical meetings for coordination and consulting with related public institutions and experts on the subject.	X	X	X			
Project preparation by the competent entity (MINAM). It is attached by a legal formula, statement of reasons, reports, studies and consulting carried out.		X	X	X		
Stakeholders' participation. Includes posting in the electronic portal, posting in the official newspaper <i>El Peruano</i> , civil society participation and indigenous peoples' organizations and review and acquittal of citizen contributions.			X	X	X	X
Consulting to the Vice-Ministerial Coordination Commission virtually, as well as meetings with involved sectors.					X	X
Heading by the President of the Republic and referendum of the Ministers (MINAM, MINAGRI and eventually the Presidency of the Council of Ministers).					X	X
Regulation posting in the Official Newspaper <i>El Peruano</i>						3d

18. DATA MANAGEMENT AND REGISTRY SYSTEMS

18.1 Participation under other GHG initiatives

Four REDD+ projects currently exist wholly or partially within the ER Program accounting area, the majority in San Martin. The objective of these projects is to reduce forest deforestation and degradation, though their baselines and monitoring events only account for deforestation emissions. In all cases, the validity of the first crediting period of these projects ends between 2018 and 2020. Details of methodology, activities, pools and gases considered by each project are shown in Table 18.1.2.

Their combined *ex-ante* annual emissions reductions are 2,870,000 tCO₂e, which is about half of the emissions reductions expected under the ER Program (assuming that all the reductions originate in San Martin and Ucayali). Nonetheless, the emission reductions volumes among projects and the ER program are not equivalent, given the differences in variables and procedures to establish the baselines.

In addition to the above-mentioned REDD+ projects, the ER Program accounting area is contained within the accounting area of the DCI's Phase III, which includes the entire Amazon biome. Phase III accounting period goes from 2016 to 2020. Peru, Norway and Germany are presently discussing the technical details regarding the compensation baseline and the potential overlap in 2020 between the DCI and the ER Program.

To avoid double-counting risks, MINAM is working to align the ER Program, the DCI, and the REDD+ projects under the Forest Reference Emissions Level by December 2019, in order to obtain estimates of emissions and emissions reductions from a single accounting framework. For this purpose, a roadmap for nesting these initiatives was established. The main milestones in the nesting roadmap are:

- a) MINAM's formal approval to the REDD+ projects for the continued use of their actual baselines until 31.12.2020, with the condition of having to apply the nesting rules as soon as they become officially available (if it occurs during 2019 as expected). This is an important action, since it will allow REDD+ projects to maintain their activities in the field without having to undergo a full baseline revalidation process, which in most likely will result in inconsistencies with the national MRV system. As indicated above, the plan is to finalize this agreement in 2019, but if delays occur in the nesting process, the

projects will have the opportunity to use their baselines until 2020. In this case, emission reductions generated by them will be deducted from the ER Program results. The approval is under review by technical and legal teams of MINAM and is expected to be given in the short term.

- b) Development of a technical proposal for nesting on the basis of a participatory process with the direct stakeholders.

Since 2018, MINAM has been working with stakeholders to develop the nesting rules to be used by every GHG initiative on reducing deforestation in the Amazon. So far, nesting has been addressed as an allocation of baseline emissions from the FREL to other accounting areas contained in it (e.g. REDD+ Projects, ERP jurisdiction). To accomplish the allocation, three options of differing complexity and criteria are being analyzed:

- **Option 1:** allocation of FREL quotas based on the initial forest area of each initiative. This option is very simple and little demanding of time and effort, making it desirable in a complex ever-evolving process. However, it does not consider the level of risk of deforestation, which is not uniform throughout the Amazon, making it possible an inaccurate allocation of expected emissions.
- **Option 2:** allocation based on forest area categorized into deforestation risk strata. Up to the moment, 3 sets of parameters were combined in differently to define these strata, resulting in 18 sub-options; nonetheless, many other sub-options could be created, depending on how the parameters are modified. This could open a time-consuming discussion which goes against everyone's aims to resolve the nesting needs before 2020.

The parameters included are:

- Methods for creating risk maps of deforestation: i) based on distances to deforestation, settlements, access roads and rivers, and ii) based on a deforestation density map.
 - Number of risk categories: 3, 5 and 10 categories.
 - Method to establish the area of each category: equal areas, equivalent distances and natural breaks.
- **Option 3:** assignment based on a spatially explicit deforestation model for the Amazon, using a bigger set of parameters in comparison to option 2. There are some important limitations for the development and later maintenance of the deforestation model, such as: existence of many appropriate variables for the analysis at different levels that in most cases would be outdated or just not available; considerable size of the area to be analyzed that exceeds the processing capacity, making it necessary to divide the Amazon in sectors, for which criteria has to be produced, socialized and accepted; the permanent need of high technical capabilities to operate the model; among others.

Preliminary results from the above-mentioned options were produced and presented to the public entities that play a role in the national MRV (DGCCD, PNCB, and SERFOR) and SERNANP, to narrow the choices based on a technical discussion. A presentation was also made to stakeholders for receiving comments and inputs to refine the options. As expected, the values obtained of the FREL quotas vary according to the option/sub-option used to produce them.

One reached consensus is on a feature wanted for the quota allocation method: it must be simple and easily applicable in order to ensure its continued use in the future, while allowing for future improvements.

MINAM will develop criteria to determine a smaller group of options to continue the national process. In the meanwhile, some improvements will be made to a chosen set of options from the last participatory event.

- c) Identification and technical analysis of other elements needed for putting in place the nesting scheme. In the course of the ongoing discussions, some concepts and scenarios were identified as crucial aspects to support the nesting proposal. The more important ones are related to scenarios of scarcity/abundance of emission reductions results, tools to avoid double counting like the mitigation initiatives registry, rights and obligations of different actors claiming emission reductions, etc.

As it is described in section 18.2 of the present document, the National Mitigation Measures Registry is on an advanced state of development. Other elements are just beginning their internally discussion, and the goal is to elaborate technical options that could be used to approach them.

An initial technical document will be produced in the next month to guide the following technical and legal analysis, participatory discussion and political decision.

One important an important aspect to be addressed, related to ERP, is the agreement between the ER Program and the REDD+ projects located inside its jurisdiction. A one-by-one discussion will be promoted in the short term to accomplish the nesting of the projects and their inclusion in the benefit sharing system, given the different capacities to maintain, generate and commercialize emissions reductions of each project. However, in the worst scenario, it is estimated that emission reductions of the ER Program will not be dramatically affected.

The expected result of the nesting process is that beginning in 2020, a set of rules will be in place to standardize emission reduction estimates, including the required use of the national monitoring system at the local and regional levels. The limited period before nesting is applied - called “pre-nesting stage” (essentially the latter half of 2019) – will permit the development of the roadmap while different baseline methodologies are allowed to coexist. The following Table summarizes the milestones and expected dates of accomplishment for this process:

Table 18.1.1. 2019 roadmap for nesting of REDD+ projects in the Amazon biome.

Activities	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2020
Participatory process for nesting development	X	X	X	X	X	X	X	
MINAM's formal authorization of a temporary institutional arrangement		X						
Refinement and technical selection of maximum 3 quota allocation options/sub-options	X	X						
Development of technical alternatives to address complementary nesting issues	X	X						

Activities	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2020
Complete technical proposal for nesting			X	X				
Internal and political discussion of nesting aspects				X	X	X		
Development of the NMMR and pilot testing	X	X	X	X	X	X	X	
Approval of the technical proposal by actors							X	
Nesting implementation								X

Finally, a connected process to nesting is the update of the current FREL. It was pointed out the importance to secure a valid new version of the FREL from 2021 onwards, for the nesting scheme to be applied. MINAM will update the FREL during 2019 and early 2020, in order to present it to the UNFCCC by march 2020.

Table 18.1.2. Description of existing REDD+ projects in the accounting areas.

ID	Project Proponent	Name	Description	Methodology applied	REDD+ activities considered in baseline	Pools and gases included	Crediting period	Estimated Annual Emission Reductions
1496	Pur Projet	Biocorredor Martin Sagrado REDD+ Project	The project aims to avoid for 80 years deforestation and degradation of forest in an area of 295,654 hectares inside three conservation concessions, located in the region of San Martin. The project area is a high conservation value area with many endemic species and several threatened species (flora and fauna), that boasts vital resources for downstream and surrounding communities. In particular, it regulates the water resources in the Huayabamba river basin and the availability of water for downstream communities and cities.	Methodology for avoided unplanned deforestation (VM0015) from VCS Historic deforestation rate spatially projected	Deforestation	Aboveground and belowground biomass Dead wood (standing) CO ₂	January 1 2010 – December 31 2019 Total crediting period: January 1 2010 – December 31 2049	219,722 (ex-ante estimation)
1360	Multiple proponents	Forest Management to reduce deforestation and degradation in Shipibo Conibo and Cacataibo Indigenous communities of Ucayali region	The project is developed in 7 native communities belonging to the Cacataibo-Shibipo-Conibo ethnic group, which occupy an area of 127,004 hectares of forest between the Ucayali (68%) and Huánuco (32%) regions. The purpose of the project is to conserve the forests of these communities with the advance of deforestation and degradation.	Methodology for avoided unplanned deforestation (VM0015) from VCS Historic deforestation spatially projected as an exponential function of population density	Deforestation	Aboveground and belowground biomass CO ₂	July 1 2010 – June 30 2020 Total crediting period: July 1 2010 – June 30 2030	564,818 (ex-ante estimation)
985	CIMA Cordillera Azul	Cordillera Azul National Park REDD Project	The project is developed in the Cordillera Azul National Park, located in four departments of central Peru: San Martín, Ucayali, Huánuco, and Loreto. The area encompasses 1,351,964 hectares of lowland and montane forests inside the national park, which are protected through the strengthening of park protection, engaging local communities and other stakeholders in land-use management compatible with conservation, and improving the quality of life of the park's neighbors.	REDD Methodology Modules (VM0007) from VCS Historic deforestation projected as a linear function	Deforestation	Aboveground and belowground biomass Dead wood CO ₂	August 8 2008 – August 7 2018 Total crediting period: August 8 2008 –	1,575,268 (ex-ante estimation)

ID	Project Proponent	Name	Description	Methodology applied	REDD+ activities considered in baseline	Pools and gases included	Crediting period	Estimated Annual Emission Reductions
			CIMA and its close advisor, the Field Museum in Chicago, have worked with communities since 2002 to ensure that the project activities incorporate and reflect the values and aspirations of local residents. The biodiversity in the project area is astounding. The forests harbor rare and endangered species, as well as abundant populations of animals and plants that are crucial to the well-being of park neighbors.	of population growth, spatially projected			August 7 2028	
944	Conservation International Foundation	Alto Mayo Conservation Initiative	The project aims to protect 153,929 ha of the Alto Mayo Protected Forest (AMPF). This area forms part of the Abiseo-Condor-Kutukú Conservation Corridor, one of the most threatened ecosystems in the world which houses an incredible number of endemic plants and animals of global importance and whose forests gives rise to several major rivers which provide clean and abundant water supplies and support several economic activities of the local population living in the Alto Mayo basin. The threats to the area have increased in the last decade with the development of regional infrastructure projects and the rising price of coffee - the main crop grown in this area - leading to increasing deforestation and the subsequent loss of ecosystem services that this NPA provides. In response, Conservation International and its allies in the region designed the Alto Mayo Conservation Initiative (AMCI), whose main goal is to promote the sustainable management of the AMPF and its ecosystem services for the benefit of the local populations and the global climate.	Methodology for avoided unplanned deforestation (VM0015) from VCS Historic deforestation projected as a linear function of time, spatially projected	Deforestation	Aboveground and belowground biomass CO ₂	June 15 2008 – June 14 2018 Total crediting period: June 15 2008 – June 14 2028	515,116 (ex-ante estimation)

Source: VCS Project Database. Available in <https://www.vcsprojectdatabase.org/>

18.2 Data management and Registry systems to avoid multiple claims to ERs

In July 2016, Ministerial Resolution No. 197-2016-MINAM created the National REDD+ Registry and approved the provisions to manage it. The purpose of the National REDD+ Registry was to contain and disseminate information related to the reduction of greenhouse gas emissions due to the implementation of REDD+ activities. It was expected that this registry would include information on reference levels, national GHG inventories, and propriety rights of emission reductions, in order to avoid double counting of emission reductions, ambiguous ownership status, inconsistencies between the National GHG Inventory and the REDD+ Registry, and social and environmental safeguards. The pilot version of the registry was open to the public until mid-2017, when it was removed from MINAM's website due to lack of sustainable resources to maintain it and some gaps identified related to minimum criteria to accept projects.

In order to comply with the requirements of the enhanced transparency framework of the Paris Agreement and the national needs for monitoring mitigation measures, the Framework Law on Climate Change¹²⁴ and its regulation (under consultation) established the creation of the National Registry of Mitigation Measures (NRMM). The objective of the NRMM is collecting and managing information on the progress level of emission reductions and the increase of GHG removals from every mitigation measure developed in the country including REDD+ activities. The registry will facilitate the payments for results-based climate finance and transfers of emission reductions to international carbon markets while avoiding double counting.

The NRMM will contain all relevant information from the mitigation measures registered, such as the description of the initiative (project document), location, standard applied (if any), methodology and baseline, among others. Additionally, the emission reductions generated under the ER Program and other emissions reduction activities and their traceability will be registered under the NRMI. This registry will also link information on carbon sequestration and storage with the Sole Registry of Retribution Mechanisms for Ecosystem Services (MERESE, see section 17.2), created by Supreme Decree No. 009-2016-MINAM¹²⁵ in July 2016.

The NRMM is presently being designed and implemented by IHS Markit, under a contract with the Ministry of the Environment. It is expected that the NRMI design will be completed by August, 2019; after a period of testing, the registry will be implemented in February, 2020. The preliminary proposal described below is aimed at providing an integrated registry that will consolidate all mitigation measures and reductions of emissions achieved in Peru in a central platform, as well as the capacity to emit reports and provide transparent access to the public. All NRMM's documentation will be in Spanish and in other languages if required later.

The NRMM will track emissions reduction for NDC compliance, local carbon markets and international markets that could be regulated under the UNFCCC, voluntary standards or other international compliance systems as CORSIA. Thus, it will include REDD+ projects, NAMAs, NDCs, ITMO, and other GHG mitigation initiatives. Its purpose is to assure quality, transparency, and traceability of the registration, approval, transfer and retirement of emission reductions, and avoid double accounting. The NRMM will form part of the national MRV system, as seen in Figure 14.2.1, and will contribute to monitor the bottom up compliance of the NDCs as well as to provide information for corresponding adjustments for international transfers of ITMOs.

¹²⁴ Approved by Law No. 30754.

¹²⁵ www.minam.gob.pe/disposiciones/decreto-supremo-n-009-2016-minam.

Article 5 (paragraph 5.1) of the Law states that MINAM has the responsibility for monitoring and evaluating the implementation of the integral management of climate change at the three levels of government, promoting the participation of the public sector, economic agents and civil society ...". MINAM, through the DGCCD, will be responsible for the management of the NRMM and will validate the contents of the registry and manage and make public information on the reductions of GHG emissions through a digital platform. Information contained in the Registry will be used by MINAM to prepare National Communications and Biennial Reports.

The NRMM will register mitigation measures, emission reductions, transfers, cancelation and retirements. It will enable the monitoring of mitigation projects or activities during their life cycle, from the design and registration of the project, the approval of the emissions reduction credits (including the steps of the approval process), and the transfer and eventual retirement of the credits, thus enabling traceability. It also includes the capacity to indicate if the project/emission reduction credit has a commercial purpose, including eventual transfer or retirement, or is solely for monitoring purposes (e.g. the NDCs). In Addition, it includes the capacity to capture projects listed on other international registries and include them in the central platform, thus creating a clearinghouse of information on all relevant emissions reductions projects in Peru. The registry will accept the creation of carbon credits from international emission reduction carbon standards and its conversion to national carbon credits for the purpose of international transfers or NDC compliance.

Figure 18.2.1 Overview of the national Mitigation Transparency Framework.

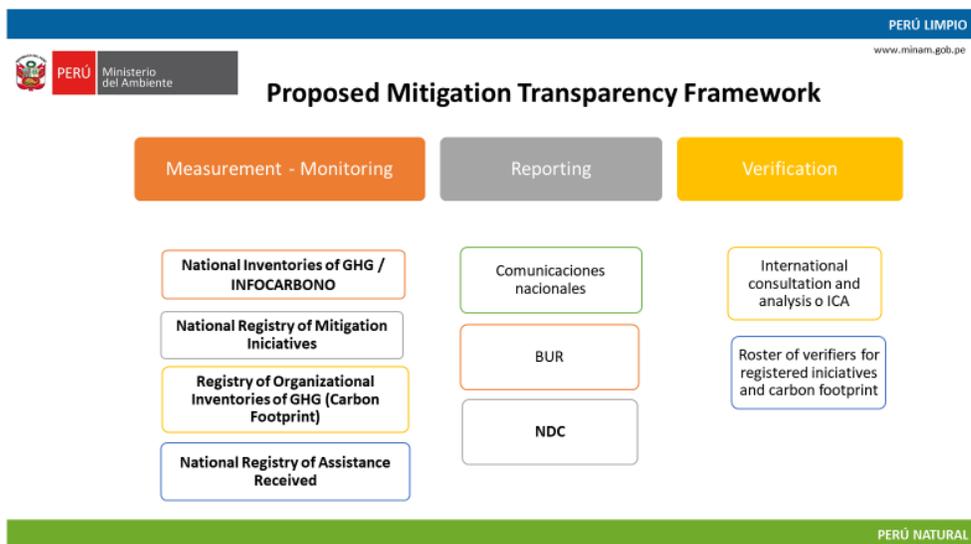
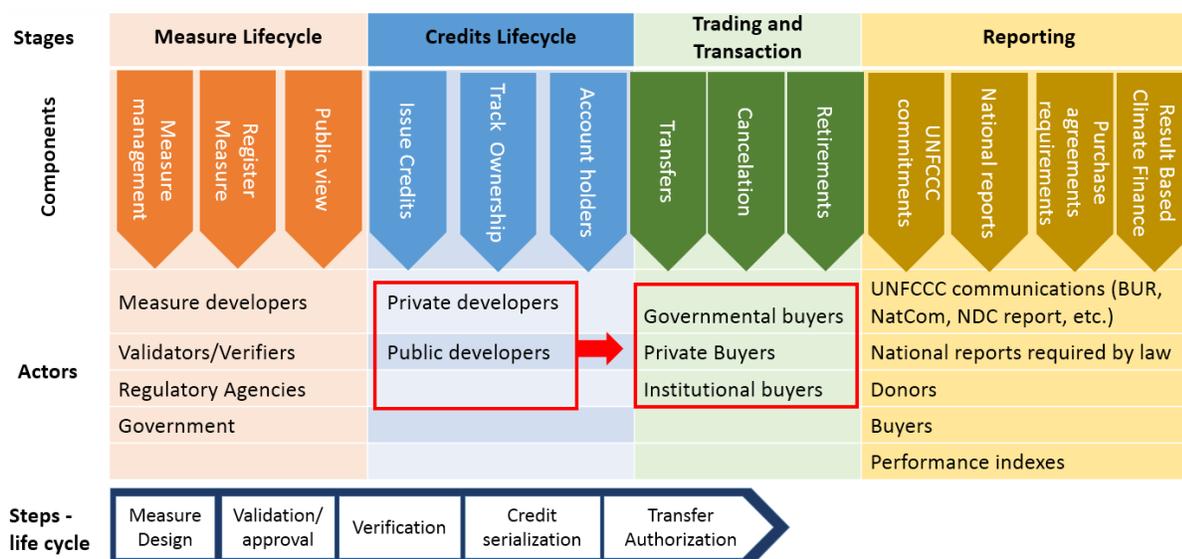


Figure 18.2.2 Arrangement of registries for GHG mitigation and MRV activities.



Modified from HIS Markit.

The information accessible to the public will include general information on mitigation measures in Peru, reductions of emissions achieved, general information related to the program or projects, documents, a list of eligible entities, and a registry page containing information related to the creation, transfer, and retirement of emissions reductions credits, as well as associated documentation. It is important to mention that the verifications will be mandatory for the mitigation measures that seek to carry out transactions, and their reports will be public.

It is contemplated that the NRMM will contain the following principal components described below.

Account administration

The account administration page will include a list of fields and menus for the capture of account information, including user orientation and instructions for opening an account.

Once the potential user inputs the pertinent account information, he/she will receive a request regarding acceptance of the terms and conditions of the registry. Acceptance will be registered by electronically checking a box in the form. At this point in the process, an automatic email will be sent to the user account email address, as well as to the administrators of the registry and all pertinent regulatory organizations confirming acceptance.

Four types of information are found in the registry:

1. Government mitigation measures
2. Carbon credits in Peru origination in external systems of certification (CDM, VCS, GS, and SDM)
3. The National Standard of Peru
4. International transactions (ITMOs/CORSIA/others)

Registry of information

The registry and its information approval procedure is a direct and intuitive process for project developers/project owners/program administrators. The forms used by the registry can capture multiple types of information related to project activities, such as the asset category, the objective of the project, the validator, the starting date, and required documentation, among others. The form will be modifiable in order to capture relevant information while assuring compatibility with the procedure for the registration of mitigation measures. The form also includes an “additional information” tab that can be personalized to include up to ten fields for additional information, as well as a tab for site information. In the latter case, the user can include details related to the location of the project or upload a KML or KMZ file with the information. The Registry will use this information to show the project’s location on a map.

Peruvian projects located in other international registries, such as that of the Clean Development Mechanism, will be included in the NRMM for national reporting purposes by making a mirror copy to ensure having complete and consistent information of such projects

Emission of credits

The NRMM will include the capacity to emit emission reduction credits. Once emission reductions are achieved and verified, the developer of eligible emission reductions projects can start the process for the emission of credits. The user can include basic information related to the emission reductions, such as monitoring period, vintage, the verifier, additional certifications, and/or public visibility. Similar to the process for the registering of the project, the user can attach all relevant documents to the form used for the emission of credits. Once the credit emission is approved, the registry will automatically generate a series number and assign it to the emission reduction credits.

Transfer of credits

El NRMM will also facilitate the transfer of credits emitted. Once a transfer is requested, it will be validated using a PIN password, via a text message or email. The notifications will be registered in the system and the users of the originating account, the users of the receiving account, administrators, etc. will be notified. This function will permit the transfer to be made almost immediately if both parties are logged on the registry. There is also an option that will permit the administrator to review and approve the transfers before it becomes visible to the receiving party.

Retiring credits

The NRMM will enable credits to be retired via a simple and direct process. The user of approved accounts can select a block of emission reduction credits and specify the quantity that will be retired and can include any relevant comments. The operation is automatic and irreversible.

Cancelation of credits

The NRMM has the capacity to cancel credits originating from environmental programs aligned with the Peru Standard, under a different process than that used for retiring credits.

Project administration dashboard

The project administration dashboard will allow the dynamic monitoring of the project. At any point in the project cycle the dashboards will show basic information about the project, including its present stage in the registering, credit emission, transfer, or retirement process. This information will include an instantaneous vision of the project, its location, the estimated volume of emission reductions, and the project's status.

Reports

The capacity to export information in downloadable reports regarding projects, emission reductions, credit holders, transfers, and retirement is of vital importance. As a result, the NRMM will offer a variety of report options to project developers, credit buyers, and program administrators. The reports will enable users to track activities in the registry and evaluate the state of their projects or properties. The reports will also enable account audits. Users can export descriptions of projects, emission reduction credits, transfers, retirements, or activities in .XLS and .PDF file formats. Users will also have a page designed specifically to allow the preparation of reports with a period of time defined by the user. Users will also have access to a registry of activities that will allow them to see all the activity of their account within a specific time period.

The preparation of consolidated reports containing information related to all mitigation measures and reductions of emissions is also included. This report will include tags to identify the state of emission reductions (i.e. active or retired) and a classification to identify which credits should be included in Peru's NDCs and which are transferable. This consolidated report will afford the necessary visibility to track national performance in related to the NDC objective. The details of the report will be further defined in the technical requirements of the consultancy.

It is important to clarify that, if at the time of the first monitoring event the NRMM is not in place or does not have the minimum functions required by the Carbon Fund working, then Peru would use the World Bank's central registry. Additionally, steps will be taken to coordinate the development of the NRMM with the World Bank.